

POWER_TIPS_PRO

COLLABORATORS

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Chapter 1

POWER_TIPS_PRO

1.1 Power Tips Pro for Lightwave Volume 1 ©1995

TOPIC CATEGORIES

```
Layout
~~ ~Modeler~~~
General
Misc
INFORMATION

~~ ~About~~ ~~~
~ Welcome ~
Power Tips Pro Logo!
```

1.2 Power Tips Pro.guide: Disclaimers and Notices of Copyright

```
POWER TIPS PRO for LightWave Volume 1 in the AmigaGuide ↔
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format is copyright 1995 by
Dean Scott
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Ronnie Norwood
and can be
FREELY distributed under the general terms of the
SHAREWARE
concept.
```

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ARE NOT responsible for the results of any information contained herein, which was gathered from the FidoNet VIDEO_TOASTER echo and from the Internet LightWave Maillist and Newsgroup.

If you find POWER TIPS PRO for LightWave Volume 1 to be of worth, then please honor the shareware concept by

REGISTERING

your

copy!

Future volumes of POWER TIPS PRO for LightWave will be made available as Dean and Ronnie search the nets, collecting and compiling hints and tricks into new hypertext help files, for BOTH Amiga and Windows PCs.

Thanks to all who've contributed to PTP from the various LightWave e-mail forums. Keep up the Great work! A special thanks to Ron Kramer, Moderator of the FidoNet VIDEO_TOASTER and to Daniel J. McCoy and David Warner, former and current Moderators of the Internet LightWave Maillist and Newsgroup, for their volunteer labors of love!

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1.3 Power Tips Pro.guide: About the Authors

Dean Scott is the Video Graphics Artist for WSMH TV 66, a Flint, MI FOX affiliate. He's been LightWaving there with an A2000/030/30/10MB VT2000 2.0/3.1. He has a Bachelor of Science in Television Production and an Associate in Applied Science in Audio/Visual Production. "I've been very active in cyberspace for over 4 years and decided to compile a collection of relevant LightWave e-mail into a large Frequently Asked Questions document. The result evolved into POWER TIPS PRO!"

You can e-mail Dean at: dscott5663@aol.com.

Ronnie Norwood is currently owner and Lead Animator of Impact Imaging, a 3D animation company. "I have never owned a computer before in my life, until I bought the Amiga 4000 Video Toaster. I pursued a musical career for about eighteen years, then I decided it was time for a change after doing almost everything from teaching guitar, to road

gigs, to running a small demo studio. I sold almost everything I had and invested it into the Toaster and Impact Imaging. Now I do mostly flying logos and architectural renderings, loving every minute of it!"

You can e-mail Ronnie at: rnorwood@cris.com.

1.4 Power Tips Pro.guide: The Shareware Concept

Shareware is a method of distributing new software at free to minimum cost. The software is usually a demo version and usually has some features rendered inactive or unusable as an incentive to the user to buy the the full commercial version. ←

Most shareware titles, however, are fully functional and require the user to register the software with payment to the author.

PTP is in this category. It's fully functional and relies on the honor system and morality of the user to

REGISTERING
their copy of

PTP.

1.5 Power Tips Pro.guide: Registering Power Tips Pro

Dean Scott
and
Ronnie Norwood

have adopted an interesting method to register users of PTP. In lieu of a check or money order, simply mail each a VHS demo tape of your LightWave animations as payment for their effort! If you have no tape as of yet and would like to help offset the cost of thier Internet accounts, then please send a donation of \$5 to \$15 US (check or money order only and payable to Ronnie Norwood)to:

Impact Imaging
PO Box 834
Roebuck, SC 29376

Registering entitles you to recieve the next volume of PTP, FREE!

Your LightWave Demo tapes can be sent to Ronnie Norwood at the above address and to Dean Scott at:

Silicon Magic
2043 Hillsdale Dr.
Davison, MI 48423-2313

1.6 Power Tips Pro.guide: Introduction And Welcome

POWER TIPS PRO Volume One for LightWave is a compilation of carefully selected and edited messages from Fidonet VIDEO_TOASTER and AMIGA_VIDEO echos and the Internet LightWave Mailing List. It contains 100 cross-referenced topics of helpful tips, tricks, and general information written by various users from a broad spectrum of fields and levels of skill, from professional to amateurs, concerning the use of all versions of LightWave 3D on all platforms.

1.7 Power Tips Pro.guide: Frequently Asked Questions on Layout

- ~~~Bones
 - ...Using Bones via The Objects Panel.
- ~~Camera
 - ...Options In The Camera Panel.
- ~~Effects
 - ...BG/FG Techniques via The Effects Panel.
- ~Envelopes
 - ...Using Envelopes Effectively.
- ~~Lights
 - ...Light And Flare Effects via The Lights Panel.
- ~~Motions
 - ...Using Motion Paths Effectively.
- ~~~Morphs
 - ...Techniques of Morphing Objects.
- ~Surfacing
 - ...Image Mapping and Procedural Textures.
- ~~~Other
 - ...Other Features Of LightWave Layout.

1.8 Power Tips Pro.guide: Frequently Asked Questions on Modeler

- ~~Booleans
 - ...Using The Various Modeler Boolean Operations.
- ~~Extrudes
 - ...Using The Various Modeler Extruding Tools.
- ~~~Macros
 - ...ARexx Modeler macros and how to use them.
- ~Metaforms

- ...Using Modeler's Metaform Tool.
- ~~Patches
 - ...Using Modeler's Patch Tool.
- ~~Polygons
 - ...Manipulating Polygons in Modeler And Layout.
- ~~~Other
 - ...Miscellaneous Modeler Tools And Operations.

1.9 Power Tips Pro.guide: General Frequently Asked Questions

- Environment
 - ...Making realistic environments
- ~ ~Logos
 - ...Ideas And Tips For Logo Treatments.
- ~~ ~PAR
 - ...Using The DPS Personal Animation Recorder.
- ~Particles
 - ...Way Of Using Particle Animation.
- ~~~~SFX
 - ...Creating Animation Special Effects.
- ~~~Space
 - ...Space And Science Fiction Techniques.
- ~~Objects
 - ...Short Model And Object Construction Tutorials.

1.10 Power Tips Pro.guide: Miscellaneous Frequently Asked Questions

- ~~~ARexx
 - ...External ARexx Scripts For LightWave.
- ~ Hardware
 - ...Hardware Info. Associated With Lightwave
- ~~Support
 - ...Sources Of Information And Technical Support.
- ~Technical
 - ...Formats, Settings, & Other Technical Info.
- ~~~Other
 - ...Other Technical Areas.

1.11 Power Tips Pro.guide: Topics About Bones

~Making~A~Page~Turn~Using~Bones~

~~~Moving~Fingers~Using~Bones~~~

~~~~Moving~Legs~Using~Bones~~~~

1.12 Power Tips Pro.guide: Topics On The Camera Panel

~~~~Calculating~Image~Size~For~Print~~~~

~Combining~Field~Rendering~&~Motion~Blur~

~~~~~Efficient~Scene~Renders~~~~~

~~~~Field~Rendering~vs~Motion~Blur~~~~

How Does Adaptive Sampling Work?

## 1.13 Power Tips Pro.guide: Topics On The Effects Panel

~~~Animation/Video~Keys~Using~Alphas~~~

~~~~~Foreground~Keying~~~~~

~How~To~Use~LW~For~CrossFade~Dissolves~

~~~~~How~To~Use~PAR~Clips~In~LW~~~~~

~~~~Lens~Flare~Alpha~Channel~Keys?~~~~

## 1.14 Power Tips Pro.guide: Topics About Envelopes

~~~~~Displacement~Map~Envelope~~~~~

~Moving~Liquid~Using~Multiple~Morphs~

~~~~~Particle~Sand~Storms~~~~~

## 1.15 Power Tips Pro.guide: Topics About Lights

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~~~~~Aligning~Lights~To~Points~~~~~  
 ~~~~~Controlling~Lens~Flare~Size~~~~~  
 ~~~~~Faking~Translucent~Objects~~~~~  
 ~How~To~Match~LW~Lighting~To~Daylight~
 ~~~Projecting~Slide~Transparencies~~~~  
 ~~~~~Selective~Shadow~Map~Casting~~~~~  
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1.16 Power Tips Pro.guide: Topics About Motions

~~~~~Particle~Sand~Storms~~~~~  
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## 1.17 Power Tips Pro.guide: Topics About Morphs

Dual Surfaces Using Object Morphs  
 ~~~Faking~Multiple~Surface~Morphs~~~~~  
 ~~~~~Making~Animated~Tank~Treads~~~~~  
 ~~Making~A~Bell~Curve~Reveal~Graph~~~~  
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 ~~~Making~An~Explosion~Shock~Wave~~~~~  
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 ~~~Tips~On~Surface~Morphs~&~Chrome~~~~  
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## 1.18 Power Tips Pro.guide: Topics On Surfacing

A~Procedural~Texture~Water~Fountain  
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Creating~Electric/Static~Fields~~~~  
~Creating~Force~Fields~~~~~  
Diffuse~And~Specularity~Interaction  
~Dual~layer~Textures~w/Transparency  
Faking~Multiple~Surface~Morphs~~~~~  
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Good~Default~Environment~Scene~~~~~  
~Making~2D~Cutouts~With~Clip~Maps~~  
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~Making~Babylon~5~Like~Nebulas~~~~~  
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~Making~Lightning~Like~Neon~Objects~  
~Making~Neon~Font~Outlines~~~~~  
~Making~Panel~Maps~~~~~  
~Making~Seamless~Texture~Maps~~~~~  
~Making~Spotlight~Beams~~~~~ ~  
~Making~Star~Trek~Deflector~Shields  
~Projecting~Slide~Transparencies~~~

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~Realistic~Lake~Water~And~Waves~~~~~  
 ~Procedural~Texture~Sand~Storms  
 ~Simple~Clip~Mapped~Christmas~Tree~  
 ~Simulating~Backlighting~Glows~~~~~  
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## 1.19 Power Tips Pro.guide: Other Layout Topics

~LightWave~And~Toaster~Specific~BBS's~~  
 ~~~~~~NewTek~BBS~Number~~~~~  
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## 1.20 Power Tips Pro.guide: Topics About Booleans

~Common~Errors~From~Boolean~Usage~  
 Solid Drill vs. Boolean Subtract  
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## 1.21 Power Tips Pro.guide: Topics About Extrudes

~Basics~On~Using~Rail~Extrude~  
 ~How~To~Make~A~Spring~Object~~

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~~~How~To~Make~a~Wood~Screw~~~

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1.22 Power Tips Pro.guide: Topics About Macros

~~~~~Aligning~Lights~To~Points~~~~~

~~~~~Paths~From~An~Extruded~Object~~~~~

~Using~Toaster~Arexx~and~Modeler~Macros~

~Wrapping~A~Flat~Polygon~Into~A~Sphere~~~

1.23 Power Tips Pro.guide: Topics On Metaforms

~Avoiding~Bugs~When~Metaforming~

~~Metaforming~A~Phone~Handset~~~

~~~Metaforming~Organic~Forms~~~~~

## 1.24 Power Tips Pro.guide: Topics On Patches

Basics On Using The Patch Function

Making A Crane Bird With Spline Patches

More Basics On Using Patch

Simple Patch Help

## 1.25 Power Tips Pro.guide: Topics On Polygons

~~~~~Overcoming~Self-Crossing~Bevels~~~~~

Self-Crossing Bevels Conclusion

~~~Understanding~Non-Planar~Polygons~~~~~

~~~~~What~Are~Detail~Polygons?~~~~~

~What's~The~Maximum~Points~Per~Polygon?~

1.26 Power Tips Pro.guide: Other Modeler Topics

~LightWave~And~Toaster~Specific~BBS's~
 ~~~~~~NewTek~BBS~Number~~~~~  
 ~~~~~~Saving~A~Scene~Layout~As~One~Object~  
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## 1.27 Power Tips Pro.guide: Topics On Environments

~~~~~Good~Default~Environment~Scene~~~~~  
 ~~~~~~How~To~Match~LW~Lighting~To~Daylight~~~  
 ~~~~~~Making~A~Desert~Landscape~~~~~  
 ~~~~~~Making~Displacement~Mapped~Canyons~~~  
 ~~~~~~Particle~Sand~Storms~~~~~  
 ~~~~~~Realistic~Lake~Water~And~Waves~~~~~  
 ~~~~~~Sand~Storms~Using~Procedural~Textures~

1.28 Power Tips Pro.guide: Topics About Logos

~Dual~layer~Textures~With~Transparency~
 ~~~~~~Making~A~Bell~Curve~Reveal~Graph~~~  
 ~~~~~~Melting~Font~Logo~Treatment~~~~~  
 ~~~~~~Tips~On~Surface~Morphs~&~Chrome~~~~~

## 1.29 Power Tips Pro.guide: Topics About The Personal Animation Recorder

~~~~~Advise~On~PAR~Video~Capture~~~~~  
 ~~~~~~Correcting~Flipped~Image~Maps~~~~~  
 ~~~~~~How~To~Use~PAR~Clips~In~LW~~~~~  
 ~~~~~~Understanding~PAR~Q~And~Block~Settings~

### 1.30 Power Tips Pro.guide: Topics About Particles

~Morphing~Particle~Volumes~

~~~~Particle~Sand~Storms~~~

1.31 Power Tips Pro.guide: Topics On Special Effects

~~~~Creating~Electric/Static~Fields~~~~

~~~~~Creating~Force~Fields~~~~~

~Dual~layer~Textures~With~Transparency~

~~~~Making~An~Explosion~Shock~Wave~~~~~

~~~~~Making~Animated~Tank~Treads~~~~~

~~~~Making~Explosion~Image~Sequences~~~

~~Making~Fire~With~Procedural~Texture~~

~~~Making~Lightning~Like~Neon~Objects~~

~~~~~Making~Neon~Font~Outlines~~~~~

~Making~Real~Explosions~For~LW~Mapping~

~~~~~Melting~Font~Logo~Treatment~~~~~

~~~~~Morphing~Particle~Volumes~~~~~

~~~~~Simulating~Backlighting~Glows~~~~~

~~~Simulating~Search~Light~Reflectors~~

~~~~~Using~Grid~Falloff~~~~~

~~Wrapping~A~Flat~Polygon~Into~A~Sphere~

1.32 Power Tips Pro.guide: Topics About Space

~~~~~Creating~Force~Fields~~~~~

~~~~Making~An~Explosion~Shock~Wave~~~~~

~~~~~Making~Babylon~5~Like~Nebulas~~~~~

~~~~~Making~Laser~Beams~~~~~


~Simple~Clip~Mapped~Christmas~Tree~
 ~Tips~On~Making~Objects~Walk~~~~~ ~

1.34 Power Tips Pro.guide: Topics On ARexx

~~~~~Aligning~Lights~To~Points~~~~~  
 ~Arexx~Script~To~Render~Multiple~Scenes~  
 ~LockedChannels~Usage~For~Modeler~Arexx~  
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### 1.35 Power Tips Pro.guide: Topics About Hardware

~~Setting~Up~GigaMem~For~LW~~~  
 ~VT4000~Software~On~An~A2000?~

### 1.36 Power Tips Pro.guide: Topics On Support

~LightWave~And~Toaster~Specific~BBS'~s~  
 ~~~~~NewTek~BBS~Number~~~~~  
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### 1.37 Power Tips Pro.guide: Technical Topics

~~~Calculating~Image~Size~For~Print~~~~~  
 ~Diffuse~And~Specularity~Interactions~~~
 ~~~~~Efficient~Scene~Renders~~~~~  
 How Does Adaptive Sampling Work?  
 ~~~~Lens~Flare~Alpha~Channel~Keys?~~~~~  
 ~LockedChannels~Usage~For~Modeler~Arexx~
 ~~~~~Pixel~vs~Object~Aspect~Ratios~~~~~

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~~~~~Saving~Hollywood~FX~Objects~~~~~  
 ~~~~~Setting~Up~GigaMem~For~LW~~~~~  
 ~~~~Studying~Grid~Value~vs~Falloff~~~~~  
 ~~~~~What~Are~Detail~Polygons?~~~~~  
 ~What's~The~Maximum~Points~Per~Polygon?~

### 1.38 Power Tips Pro.guide: Other Miscellaneous Topics

~LightWave~And~Toaster~Specific~BBS's~  
 ~~~~~NewTek~BBS~Number~~~~~  
 ~Saving~A~Scene~Layout~As~One~Object~~
 ~~~~The~Internet~LW~Mailing~List~~~~~

### 1.39 Making A Page Turn Using Bones

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#### Making A Page Turn Using Bones

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QUESTION: How does one use bones to turn a page of a book object? I need an inside page to flip realistically to the next page, as if it were pulled from the top corner.

I will tell you how to do this with bones, but I think it would probably be simpler with morphing. First triple the polys in your page in modeler and subdivide until you have a few hundred polys. Then be sure to save the page as a separate object from the book, because you do not want the bones to influence the rest of the book. Export back to layout and with the page object selected, go to the Skeleton menu and add two bones. In Bone Select mode, select the first bone and select Rest Length from the tool menu on the left of the screen. Now, make the bone about the same size as your page and position the bone so that it's axis is parallel to the page. Hit Enter to make a key frame for the bone at frame 0, and hit 'r' to make the bone active. Select the second bone and with rest length active make the bone about 1/4 the size of the page. Make the first bone the parent of the second one and place the second bone at the corner that you want to curl and set a key frame at 0, and at the last frame before your curl starts. Hit 'r' to make the bone active. Moving the second bone should cause the corner of the page to curl after it, while moving the first bone will move the entire page. Since the page is a seper-

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ate object it will have to be parented to the book and have its pivot point moved to the books' spine so that rotating the page on the correct axis will cause it to turn while moving the bones will cause the page to curl. In my opinion, it would be simpler to curl and turn the page in modeler and save several copies in different positions and morph between them.

## 1.40 Moving Fingers Using Bones

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### Moving Fingers Using Bones

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QUESTION: My character, a living tree, is supposed to have 3 separately moveable fingers, but each one of the bones affects all 3 fingers! I've turned Limited Range ON, decreasing the value, but this only results in lack of control of the finger tips. Is there a way to restrict the effects of a bone to an assigned surface?

Unfortunately, all bones in an object affect all parts of the object. In this case "Limited Range" will be of "Limited Usefulness." Even if you get the bones to where they only control the finger they are in, when you move the fingers close together, the bones will again interact with the other fingers.

You might try making each "finger" a separate object. The only problem with this is if you are going to move the arms with bones. The finger objects will not follow the end of the arm if it is moved with bones. If the arm is a separate object then making the fingers separate objects with the arm (or hand) as a parent should solve your problem.

## 1.41 Moving Legs Using Bones

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### Moving Legs Using Bones

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QUESTION: I'm having a problem using Bones for the first time. I'm trying to move a human figure, but when I try to move the bones to bend one leg why does the other leg and foot deform?

Try thinking of bones as skins rather than bones. If you put only a central bone in something like a leg, you will get those problems where the influence of the bone affects some places you don't want influenced, and misses some places you do.

Do this: put a central bone as a parent for 6 or 8 bones in a ring around it. You don't even need to activate the cen-

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tral bone. You need to do something similar for the thigh, leg, and foot. Then you manipulate the central bone and the others follow. Since they are right on the polygon skin of the object, you get better influence.

Don't forget to put a bone/skin structure into any area adjacent to the areas you are moving, to act as an anchor. For example, even if you will only move one leg, put bones in the other so the influence doesn't 'leak.' And if you are moving the legs, you must put bones in the belly, so it does not distort as the legs move.

## 1.42 Calculating Image Size For Print

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### Calculating Image Size For Print

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QUESTION: How do I go about figuring out the correct resolution to render at for specific print sizes?

What you need to have is a couple of pieces of information regarding the final printed image. You need the size, and you need the density of the line screen. You can then use these pieces of information to figure out what pixel resolution you need for a given print job. The relationship is that you need between 1.5 and 2 times the number of pixels as you have halftone dots. For simplicity, let's use 2x the line screen and work from there.

Let's say that your printer tells you that your image is going to be reproduced at 8.5 x 11, with a 133 line screen (common in magazine work).

Translated, this means that there will be 133 halftone dots per inch in the final piece. That means, you will need 2x that, or 266 pixels per inch, in order to produce a quality reproduction.

Now, you know the size of the piece is 8 1/2 x 11, which means your image has to be 8.5 x 266 = 2261 pixels wide, and 11 x 266 = 2926 pixels tall.

If the line screen goes up, so does the resolution you need. For example, say that the 8.5 x 11 is going to be printed with a 150 line screen. Then you'd need 300 dpi in your image, which works out to 2550 x 3300 pixels. If the line screen goes down, then you need less resolution. That same 8.5 x 11 at an 85 line screen (common in low-end printing) would only need to be 1445 x 1870 pixels.

Now that is in theory. In practice you can get away with less resolution. The 2x quality factor we used above is the limit. Beyond 2x there are no quality gains. However, generally anything above 1.7x is a waste of resolution and will not result in a visible difference in the printed piece.

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Have a look at the following chart, which shows resolution requirements for that 8.5 x 11 picture at different line screens and quality factors:

| Line Screen | 2x Quality Factor | 1.7x Quality Factor |
|-------------|-------------------|---------------------|
| 85          | 1445 x 1870       | 1228 x 1589         |
| 133         | 2261 x 2926       | 1921 x 2486         |
| 150         | 2550 x 3300       | 2167 x 2805         |

## 1.43 Combining Field Rendering & Motion Blur

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### Combining Field Rendering & Motion Blur

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Motion Blur pretty much overwhelms the effect of field rendering. Also, I was >told<... that FR and MB are mutually defeating, and if memory serves... Allen Hastings confirmed that conjecture.

See also: [Field Rendering vs. Motion Blur](#)

## 1.44 Efficient Scene Renders

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### Making Scenes More Render Efficient

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QUESTION: I read someone say that segment size was a factor in making scenes render more effieciently. As far as I know it's irrelevant unless you use anti-aliasing where it has to anti-alias between the segments, also. What's the truth?

It's NOT irrelevant at all! In fact, this feature was requested back when Allen Hastings first implemented field rendering. LW does a fair amount of setup calculations every time there is camera or object motion. With field rendering, their is motion between the two fields, meaning that these calculations must be performed twice. But, when you render with multiple segments, the setup calcs are performed twice for each segment. Using the default segment size, that means 8 times rather than 2. This can really add up for relatively complex scenes. The same is true for Motion Blur and Depth Of Field, ie. Number of Setup Calculations = (AA passes) \* (# of segments). This is one of the many little things to make scenes more efficient that most people don't know about

Another way to chop render time significantly is to not render your entire scene for every frame. Compositing is much faster than rendering.

If your camera is locked off, render the Background once and then composite it with your foreground objects. You can do

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some amazing things in a compositor that would be quite costly to do in the render. And if your render is just a tad off, you can fix many minor faults in the process, like gamma, contrast, and other color correction issues.

Even if you have a moving camera, you'll save yourself a ton of time by rendering out your BG and FG layers seperately. When the lighting for one layer is done, that's it, you never have to render it again.

Rendering in layers affords scenes of greater complexity than your current level of RAM can hold. But most importantly, anything that cuts back on per-frame compute time will allow for more iterations on a scene. I know it sounds rather snotty but a majority of the images published in LW and PC graphics mags look like the artist tried one or two cracks at their lighting and that was that.

Watch your favorite CGI laden film, commercial, video, etc. and you can bet that each and every rendered element was tested and tested and tested, tweaked and tweaked and tweaked, ten, twenty, thirty iterations. Not aways full frame ranges, sometimes tweaking parameters on single frames is all it takes. The devil's in the details, and sometimes it just takes a few tests to make something that looks "ok" into something that looks "outstanding."

## 1.45 Field Rendering vs Motion Blur

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### Field Rendering vs. Motion Blur

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If one is trying to emulate the "film look," Motion Blur is much more an artifact of film than video, so MB is more desirable for film look. Field Rendering is exclusively a video phenomom, so motions rendered with FR are going to look more video-ish, for better or for worse.

## 1.46 Animation/Video Keys Using Alphas

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### Keying Animations Over Video Using Alpha Mattes

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QUESTION: How do you superimpose LW animations over video? I have tried using the Toaster's Luma Keyer with very poor results... I get a lot of bleed through on darker objects and shadows even after adjusting the key clip level.

You can composite animations over video by rendering your animation on a black background, render mattes, and combine it over any video footage you want. In this way you have the

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option of changing the background footage at any time. When rendering you have the option of saving alpha channel animations in either 8 or 24 bits. Alpha channels are pure white shapes over a black background everywhere an object is rendered. In the switcher you can use the art card effect to combine an alpha channel animation with it's normal counterpart over a video background. Because the alpha channel is pure white over black it cuts a hole for the regular animation to be luma keyed through, even self shadows.

With the art card active, have your background selected on the program bus, the alpha channel on the preview bus, and the animation on the superimpose bus. Key on black to allow the background to show through.

## 1.47 Foreground Keying

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### Foreground Keying

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I recently used this trick for a flying logo. Using a foreground image as a key, I got Lightwave to render the frame where the logo came to a stop, then used ToasterPaint to color the image red (R=255, G=0, B=0) wherever I wanted the foreground image to be transparent. In fact, I cut off a little extra so the object itself would be partially visible behind the keyed image.

This way, Lightwave would be forced to render and anti-alias the places where the object met the background, which was also animated; a 100 frame loop I'd previously rendered and saved to the hard drive, used as a sequence in this scene).

The keyed image was rendered seamlessly with the object right behind it, and Lightwave wasted no time rendering the part of the object that was covered by the mask.

I'm still using 2.0, so it was important that I be able to render this part of the sequence in high resolution. With the foreground mask, it took about a minute to render each frame; without the pre-rendered foreground, it took nearly ten. The "fly on" and "fly off" parts of the logo were done in medium resolution. You can't tell the difference when the logo is moving especially since the moving background sequence was also rendered in high res.

## 1.48 How To Use LW For CrossFade Dissolves

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### How To Use LW For Crossfade Dissolves

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QUESTION: Does anyone know of an easy way to cross fade one

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sequence of frames to another? Perhaps using ADPro, FrEd, Multi-Frame or something like that?

LightWave!

Put one sequence in the Foreground (Effects Panel) and the other one in the Background and use the Foreground Fade Envelope to control the transition.

## 1.49 How To Use PAR Clips In LW

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### How To Use PAR Clips In LW

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QUESTION: How do you import PAR clips as image sequences in LightWave?

In the PAR's Preferences menu, click on EMULATE and then return to LW (keep the PAR running). In LW, when you select Load Image Sequence, choose the PAR's DDR: drive and click on which animation or video clip you've recorded. The important thing is to put a PERIOD at the END of the selected filename of the sequence (ie. TestAnim. ). It will then act as a sequence and the frames of the clip will correspond to the frames of your new anim.

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You have to have the EXPORT gadget in the PAR software set to IFF and the EMULATE button pressed ON in the PREFS screen. To load a PAR anim or video clip into LightWave as an image sequence, enter the directory path and anim name followed by a PERIOD. To load a single frame of an anim do the same but add the three digit frame number after the period. To load a PAR still just click on the file name like a normal image. This procedure will also work for AdPro, but not for TPaint.

## 1.50 Lens Flare Alpha Channel Keys?

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### Making Alphas For Lens Flares

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QUESTION: Is there a way to produce an alpha channel for lensflares? Please explain the theory behind it to me

Read the article on alpha channels in the July 1994 issue of LWPro. This as well as many other issues were covered.

Lens flares are an additive effect, ie. adding them to some image should not in any way diminish the intensity contribution of any pixel. The standard formula for combining two images using alpha is:  $\text{PixNew} = [\text{PixFG} * \text{alpha}] + [\text{PixBG} *$

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(1 - alpha)] where alpha is scaled to a value from 0 to 1.

As you can see, with a translucent object (say alpha = 0.5), the background will be decreased in value by 50% to arrive at the new pixel value. Therefore, what you really want to do is render your lens flares over a black background, and then when you composite them, simply do an absolute add of flare to the background (or using the format of the equation above:  $\text{PixNew} = \text{PixFG} + \text{PixBG}$ ). Once your flares are rendered over a black background, you simply load the image(s) into the foreground in LW and composite them over your other graphics using a completely black image for alpha (or using the alpha that was generated by LW when the flares were rendered, which will be all black unless there were objects other than lights in the scene). The other option is to composite the flares externally in something like ImageFX. In this case, you would use the "absolute add" compositing mode for the flares.

## 1.51 Displacement Map Envelope

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### Displacement Map Envelopes

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QUESTION: What I would like to do is morph one object with a Displacement Map into another object without one. On the source object I have an animated rippling displacement (so I can't just save transformed). When I morph to the target object, the Displacement Map of the parent still sticks. I wish there was an envelope menu to control the time span and % of the displacement, then I could ramp it out as I ramp in the morph. Is there a way to fix or fake such?

There's a hidden feature of using the Polygon Size envelope to control a Displacement Map. Be careful only to use 1 for 100%. 0.5 for 50%, and 0 for 0%, or any thing in between and not 100 for 100%. etc.

## 1.52 Moving Liquid Using Multiple Morphs

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### Moving Liquid Using Multiple Morphs

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If you just want to have wine (or any liquid) seen through a glass, you'd have to make sure that not only was the liquid surface at the proper refraction index (and color for wine), but also the polygons of the glass that are below the surface of the wine would have to be the same refraction, color, etc.

Now, to get the wine to move, as in up and down the sides of the glass, the only way I know would be to use morphing. In

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Modeler, create three identical wine glasses, and make three different wine appearances in each one. One glass would have the wine surface level; completely horizontal. This could be named Wine1. The second and third would have the wine at a slant, as if sloshing inside the glass... one slanting one direction (Wine2), the other in the opposite dir. (Wine3).

In Layout, set Wine2 as the morph target of Wine1, and Wine3 as the target of Wine2. Now set a repetitive morph envelope for Wine2: have it at 0% at frame 0, 100% at frame 8, and back to 0% at frame 16, with the envelope set to Repeat. This will set the sloshing effect of the wine.

Now set the morph envelope of Wine1. Let's say you have the wine glass on a table, and the table gets bumped so the wine sloshes around a bit, finally settling back to a stable condition. Set a key in the morph envelope one frame before you want the sloshing to begin, with the morph level at 0% and the spline control at Linear. On the next frame, set a key at 100% morph level. Now calculate how long you want the sloshing to go before settling down completely. If you want it to slosh for 8 seconds, set a key 240 frames after the sloshing began, with the morph level at 0%.

I borrowed this idea from a trick I read on how to make a plucked string vibrate, then settle. The principle is the same (set the Wine2 and Wine3 glasses at 100% dissolve). For Wine1, it will be stable until its morph is anything above 0%. Then it will begin morphing into Wine2, which is oscillating from its own sloshed state to the opposite slosh in Wine3, and back again constantly. Therefore, with the Wine1 morph at 100%, you will get the full sloshing effect. As the morph level decreases, the sloshing decreases in intensity.

To add realism in the sloshing, slowly rotate the glass on the Y axis as it sloshes. Since the glass is symmetrical, the rotation should not be noticed, and it will appear as if the wine is randomly sloshing around the glass, instead of just back and forth in the same positions.

## 1.53 Particle Sand Storms

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### Particle Sand Storms

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QUESTION: I would like to make a storm of some kind with wind blowing dust around and I don't know how to create such.

For the dust storm you might want to make a particle cloud using the Points Spread macros in Modeler. Save it as Dust, then load multiple copies into layout. Make sure each cloud is a fairly large cube, possibly covering 500 meters.

If you want steady moving dust, try using parenting in rows. This way, you can cycle each row back to repeat a pattern

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for constantly moving dust like this:

Try loading 12 copies of your dust object. Parent copies 1 & 2 to 3; 4 & 5 to 6; 7 & 8 to 9; and 10 & 11 to 12. Now arrange them in 4 rows using the X and Z values given below for each numbered copy:

|         | Particle Cloud # |       |       | Z value |
|---------|------------------|-------|-------|---------|
|         | -----            | ----- | ----- | -----   |
|         | 1                | 2     | 3     | 1500    |
|         | 4                | 5     | 6     | 1000    |
|         | 7                | 8     | 9     | 500     |
|         | 10               | 11    | 12    | 0       |
|         | -----            | ----- | ----- | -----   |
| X value | 1000             | 500   | 0     |         |

(This is if you used the 500 meter size in modeler)

Now, by moving the parents 3, 6, 9, and 12, each entire row will move. To make this dust cloud cycle, set the motion envelopes for the row parents as follows:

(all values given are for the Z position):

|        | Frame# | Value |         | Frame# | Value |
|--------|--------|-------|---------|--------|-------|
|        | -----  | ----- |         | -----  | ----- |
| Dust3: | 0      | 1500  | Dust6:  | 0      | 1000  |
|        | 74     | 2000  |         | 149    | 2000  |
|        | 75     | 0     |         | 150    | 0     |
|        | 300    | 1500  |         | 300    | 1000  |
| Dust9: | 0      | 500   | Dust12: | 0      | 0     |
|        | 224    | 2000  |         | 300    | 2000  |
|        | 225    | 0     |         |        |       |
|        | 300    | 500   |         |        |       |

Set all motion envelopes to repeat, with ALL keyframe spline controls on Linear. This will cause all the dust to move at 200 meters/second, covering 2 Km in 10 seconds and making a complete cycle of the rows. You can scale the keyframes as you wish to speed up or slow down the dust.

To surface the dust, make it the same color as your desert and maybe a tad transparent. Use Particle Blur on the Camera panel to make the motion less strobed and possibly Motion Blur as well.

## 1.54 Aligning Lights To Points

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### Aligning Lights to Objects

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QUESTION: Since we can't load lights into modeller, is there a way that I can align a bunch of lights in layout to the path of an object?

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Yeah. Use the Macro called "Lightswarm." It'll take all the points in the current Modeler layer, and create a scene file with a light at each point.

Poke around in the ARexx\_Examples directory sometime. You'll be amazed at what you can find in there.

## 1.55 Controlling Lens Flare Size

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### Controlling Lens Flare Size

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QUESTION: I'm working on an anim where there are 30 - 40 animated lights. Each changes intensity over time, starting very close to the lights then moving away. Unfortunately, as you move away, the flares don't get smaller in the distance. Is this normal?

I did an animation that simulates a fiber optic cable. My scene has more than 30 lights! I didn't set the Dissolve With Distance option ON in the Flare Options Panel (version 3.5 only). Instead I used envelopes for both light and flare intensity and it works very well. I wanted to have some kind of flash at the beginning and the results were great. After the camera went into the fiber optic cable, I put the light and flare intensity to zero.

## 1.56 Faking Translucent Objects

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### Faking Translucent Objects

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QUESTION: I have a lamp from a kit that is made up of many pieces of very thin wood. The wood's thin enough that light on one side shines through the other, making it glow in such a way that you can see the light's hot spot, but not the light itself. How can I model/render this effect in LW?

You have an interesting problem there. What it sounds like what you are trying to simulate is translucency, which is something that LightWave has to be tricked into doing. Adding a little luminosity to the surface sounds like a good start for getting a little glow into the wood. But here's a more subtle approach.

Try to place a light inside the object, set to Ray Traced shadows. This will give you the pattern of light coming from the object as it shines on other objects. To make the wood glow properly, try placing several small lights around the outside of object set to an orangish colour with low intensity and moderate intensity falloff. This will have two benefits... it will warm up the shadows in the immediate

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vicinity of the lamp (simulating translucency) and will make the wood appear to have a glow.

By carefully positioning these external lights and by carefully controlling their intensity and intensity falloff, you can get a more realistic effect than just luminosity alone. Have a look at the real lamp and see if the glow in the wood strips isn't more intense at the midpoint and less so at the top and bottom. The external lights will help you simulate this kind of effect.

As for the light being visible inside the object -- it won't be unless you go out of your way to make it so.

## 1.57 How To Match LW Lighting To Daylight

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### Matching LW Lighting To Daylight

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For matching daylight shots, it is often handy to crank up the ambient light a bit to mimic all the diffuse reflected light that is present outdoors.

Here's another tip. Find your brightest and darkest values in the footage you're trying to match to. Now match your CG elements to these values. The brightest part of your CGI element should be no brighter than in the live plate, likewise the darkest areas.

A good inspection of your live plate will also show you any bias towards a particular primary that you need to match as well as the distribution of midtones. Once you find the range that you should be in either wank on your CGI element in the render, altering object and lighting settings, or do it post-render in a compositing/image processor. Neither way is going to be quick or painless (rendering a relatively neutral CGI element gives you latitude to color correct it in the composition, but at the same time if you have to alter your CGI element too far you'll start clipping your values).

- o Light your object with ZERO specular...phong shading looks like phong shading, and after THE LAWNMOWER MAN even Ma & Pa Kettle out in BFE know what phong shading looks like.
- o Get your diffuse lighting working. Get your color going in the right direction, contrast, etc.
- o Create some planar objects which will represent your lights like squares, circles, etc. Make them completely ambient (LUMINOUS) so that they do not shade but will look like a flat color.

Turn off shadows for these objects completely.

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Position these objects so that they're approximately where your lights are. You can even parent the shapes to your actual lights. Just make sure that they aren't in your picture.

- o Now add reflectivity to your object needing specular highlights and tweak until your highlights appear as desired.

...this works really well at simulating light from light-boxes and bounce cards and lets you create nice little "Tin Toy"-like windowframe highlights too! But, if you think about it, and look closely at the objects around you, most highlights don't look like little pinpoints of white, which is all you get out of most CGI packages.

This technique also makes shiny objects look "slick," more like they were lacquered. Many colored shiny surfaces are actually two surfaces: a rather matte layer of color with a glossy clearcoat over the top. Phong shading doesn't approximate a non-homogenous surface like this very well.

## 1.58 Projecting Slide Transparencies

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### Projecting Slide Transparencies

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QUESTION: Can spotlights shine through partially transparent objects to make a soft shadow on something? I know you can use Clip Maps to allow a Shadow Mapped spot to cast a shadow of an image (like the letters example in the manual), but it creates a hard edge.

Spotlights can be set to "shadow mapping" which casts soft-edged shadows, but these do not recognize object transparency. Ray-traced shadows are hard edged, but they cast shadows that vary according to object transparency. It's a trade off. Clip Mapping is something else. The example in the manual is trying to show you the difference between object transparency and clip mapping with respect to shadow mapping. Since the shadow mapped spotlight will not honor transparent objects, don't use transparency to shape objects that are to cast shadows; use clip maps instead.

QUESTION: Okay, what I want is a slide projector effect. Can an image be mapped onto a plane and have a light shine through that image to project that same image onto the rest of the objects in the scene?

Yes. Make sure that the surface of your "slide" polygon is set to "doublesided," otherwise it will not cast a shadow. Map the picture you want projected onto the polygon as a color texture, set transparency to 100%, and press the Color Filter button ON. Set up your spotlight to shine through

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this polygon (view from light works great for this) and adjust your spotlight Cone Angle to control the spread and coverage along with the light placement. The closer the light is to the polygon and the wider its Cone Angle, the wider the field you can cover with the projection. Turn on "trace shadows" in the camera and you are all set.

(This will cast hard edged images since it's done via ray-tracing, using a processed image that's blurred or softened a bit will make for a more diffuse image will be projected - Editors)

## 1.59 Selective Shadow Map Casting

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### Selective Shadow Map Casting

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QUESTION: Is there any way an object can be excluded as a possible target for shadow maps?

It may be little known, but in order to disable shadow maps appearing on an object or an object casting a shadow map, you must have BOTHh Self Shadow and Cast Shadow options toggled OFF as opposed to the single options for Ray Tracing. For an object not to receive a shadow map, turn OFF Receive Shadow AND Self Shadow.

## 1.60 Simulating Search Light Reflectors

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### Simulating Search Light Reflectors

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QUESTION: How difficult would it be to add a flare effect that simulates a reflector based on light sources such as a flashlight, car headlights, or helicopter searchlights? For instance, when a helicopter's searchlight is oriented 45 degrees away from the camera, the flare (and glow) is much less intense than if the light were pointed straight at the lens.

By recessing your flare source into your reflector object, enabling Fade Behind Object, and making the object a shadow caster, you will get a very basic attenuation. The flare will fade quickly as the reflector obscures the source and maybe not as gradually as you might want. Although it is not perfectly accurate, it looks pretty good.

## 1.61 Smooth Repetitive Object Motions

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 Smooth Repetitive Object Motions
 

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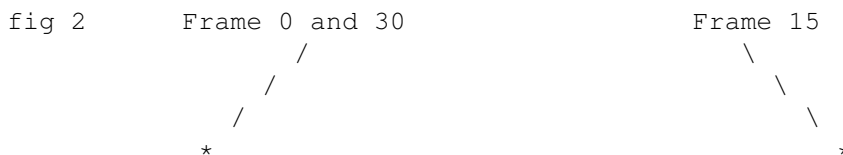
QUESTION: I have set up a 30 frame animation of an object swinging back and forth. When I create a wireframe preview, the point where it goes from frame 30 back to 1 is very rigid. I want it to be smooth. How do I do this?

Are your start & end key frames in the same place like fig 2?

INCORRECT



CORRECT



You should not have a keyframe at 1 and the Tension setting for 0 and 30 should be 1.0.

(set the motion path mode to REPEAT and the object will use those first 3 keyframes throughout an entire animation, no matter how long it is -- Editors)

## 1.62 Satellite Trajectory Using Null Object

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 Satellite Trajectory Using Null Object
 

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QUESTION: How can I animate the motion of a satellite that orbits the Earth in a perfect circle then shoots toward then begins to orbit the moon?

Parent the satellite to a null, but don't parent the null to the Earth. Instead, select the Earth object and get its coordinates from the numeric requester and input them for the null and make a key. Spin the null to make the satellite orbit the Earth and make a key at the end of its rotation at the point you want the satellite to fly off. At this key, set Linear motion so the null won't anticipate the take-off move and set Tension to -1 for a fast "throw" away from the Earth.

To get the satellite to leave the orbit and head towards the moon, make a new key with the null at the moon's position

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(use the numeric requester again) and the motion tension for this key at 1 to ease the null into position. At this same frame, adjust the position of the satellite in relation to the null to account for the moon's different size. This way, while the satellite is moving from the earth to the moon, it is slowly changing its distance from the null in preparation for a new orbit size.

Finally, rotate the null to spin the satellite around the moon, and make a key where the rotation ends. Set motion to Linear so the null won't over-shoot its position at the moon after coming from the Earth.

## 1.63 Tips On Making Objects Walk

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### Tips On Making Objects Walk

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QUESTION: I have constructed a walking mechanical looking thing similar to the Sand Walkers in Star Wars, but much smaller and only two legs. This objects starts it's motion from a crouched position then stands and starts to walk. When the object begins it's standing motion the feet go below the ground surface. When giving multiple parented objects such as this a walking motion path, it seems that the feet slide as the object takes a step. How do I overcome these problems?

A good looking walking motion is one of the most deceptively difficult tasks to animate properly. Plan to spend some time with this. I can give you some hints though.

First, don't try to make a single set of motions to make the object stand up and then walk. Break it down into two different sets of motions, where the end position of the standing motion is the start position of the walking motion.

Second, work with the model alone in the layout, without any background elements. Create the stand and walk "in place" without forward motion. That comes later.

Third, work out the walk motion on a piece of graph paper first. Figure out exactly where you are going to move the feet, and make sure that when the foot is in contact with the ground that it has a linear velocity. If it speeds up and slows down as the foot draws back, it will make it extremely difficult to add the forward velocity to the body and not have the feet slide. Figure out the movement for ONE leg, and then copy and transpose the values for the other, once you get the first leg figured out.

Save the "Standing" Scene and "Walking" Scene as two different scenes, because what you will want to do is to work out a single walking cycle and then have it repeat over and over again in the final scene as you move the body around.

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Fourth, once you have the legs walking, you can then start to play with the forward motion, figuring out how far the body has to move so that the feet don't slide.

Dean Scott adds:

He he! Even the gang at FI can't do this! Take a good look at part 2 of the episode where they find the planetary machine inside Epsilon 3, the planet B5 orbits. Look for the "slide" walking Londo on the catwalk about 3/4 thru.

Best that you can do is to eyeball it. Can't get perfect without inverse kinematics (foot stays planted while body moves forward, leg pieces follow). It can be done, though.

The art is to move the body using a start and end key, then make a single cycle of the legs to match the speed of the body (use Scale Keyframes in each object's motion graph to adjust the "frequency") and set end of motion to Repeat. Scaling the keys will squish or stretch the keys until the feet "move" at the same speed as the body in opposite directions.

In this way, all you have to do is set the initial STYLE of leg movement keys once. Just make sure you scale adjust EQUALLY to EVERY piece.

## 1.64 Using Multiple Null Object Parenting

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### Multiple Null Object parenting

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Using "extra" parents via null objects gives you much better control over spline motion. An example is when 2 boxes have to land, one after the other, inside a larger box. In this case each box takes up half of the larger box and any spline motion in the X direction will make the second box crash into the first as it lands.

The solution is to parent the second box to a null object which is used to provide the X-axis motion. Now, by making the spline Linear on the X-axis, you can still have the object ease into place on the Y-axis. This is a very successful technique.

## 1.65 Faking Multiple Surface Morphs

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### Faking Multiple Surface Morphs

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QUESTION: I know you can morph from one object to another

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to another to another (just with successive morph parenting and setting morph envelopes appropriately), but I thought this worked with surface morphing as well?

No, you can't morph surfaces beyond the first morph target.

But, as with most things in LW, there's a good way to fake it.

1. Load objects 1, 2, and 3.
2. Set 1 to morph to 2, 2 to morph to 3. Turn Morph Surfaces on for object 1 only.
3. Set up an object 3 Dissolve Envelope that starts at 0% and remains there until the frame right before it's 100% morphed to 2. Create a Dissolve Envelope for 2 that starts at 100% and remains there until the frame right before 1 is morphed to 2. At this frame, set the envelope for 1 to 100%, the envelope for 2 to 0%, and set the spline for the frame to Linear.
4. Create Morph Envelopes for 1 and 2.

When you render and playback the animation, object 1 and its surfaces should morph to object 2, which should then seamlessly morph to object 3 and its surfaces.

## 1.66 Making Animated Tank Treads

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### Making Animated Tank Treads

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QUESTION: I need to make tank treads move. What's the best way to do this?

Create a Bump and/or Displacement Map in a paint program with the raised area of the tread white and the in-between areas black. Then go into modeler and create a two sided plane object with a slight amount of thickness. Be sure to create it with a generous amount of segments. Give it the surface name of "Treads" and save it. Now use the Bend tool and curve the plane back upon itself in the manner of a tank tread. When you have the proper shape give it a different surface name and save it under a different name. Now, in Layout load both objects and give the plane object the Bump Map, or the Displacement Map if it has lots of polys. Morph the the plane into the tread shaped object and give the texture a velocity on the lengthwise axis. The texture will now follow the circular path giving the illusion that the tank treads are moving.

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## 1.67 Making A Bell Curve Reveal Graph

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### Making A Bell Curve Reveal Graph

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For the sake of simplicity let's say the shape of your graph that you want to reveal is an upside down letter 'U' (close to a bell-shaped curve). Let's assume you'd like the curve to start being revealed from the left, proceed up the left leg around the arch and down the right leg.

#### Modeler Steps:

1. Create a long straight bar in the Face view by using the square tool, let's say 4 meters long on the X axis and .5 meters high. If you want you can give it some depth along the Z axis, but for test purposes don't add any depth. Give the bar about 50 segments on the X axis. The more segments, the smoother your final image will look.
2. Name the polygons for this bar "StraightBar" and save the object with the name "StraightBar.lwo"
3. Copy this object to layer 2.
4. Now comes the fun part. Using the bend tool under Modify bend the bar until you get the shape you want (in this case an upside down 'U').
5. Rename the polygons to "BentBar" and save the object with the name "BentBar.lwo"

#### Layout Steps:

1. Load your two objects "StraightBar.lwo" and "BentBar.lwo" into Layout.
2. Under the Objects panel, set Object Desolve for "BentBar" to 100%. We're only using this for a morphing target, so it shouldn't be visible.
3. Select the "StraightBar" object and set Metamorph to 100% and Metamorph Target to "BentBar." If all has gone well your "StraightBar" will look just like "BentBar."
4. Now go to the Surfaces panel and apply the (previously created image brush sequence of a black rectangle turning white from left to right over 60 to 120 frames - Editors) as a transparency map.

The trick here is that the surface maps still see "StraightBar" as being straight and not as having been morphed to the bent version (so that the image sequence travels straight across the straightbar now morphed into the bell curve bar - Editors).

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Remember that an object that has been morphed and whose surfaces have any Specular Level at all will prevent the object from being 100% transparent when using an image map or animated sequence.

## 1.68 Making An Explosion Shock Wave

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### Making An Explosion Shock Wave

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QUESTION: If anyone has seen STVI: The Undiscovered Country, there's a scene where the Klingon moon, Praxis, explodes sending out a ring "shock wave." How can this be done in LW?

Here is a short and simple summary: Create a long rectangular strip (or bar) with 40 or more segments along on the X axis with dimensions something like X = 60, Y = 0, & Z = 6. Save it. Perform a 360 degree X axis Bend so that the strip loops around on itself. Save it as a morph target. Now load the first object and morph it 100% to the target. Then use multiple noise textures that move toward the center of the ring and falloff to 100% transparent on the inside. Give the textures some velocity and then animate the whole thing by just scaling it up from size = 0.

(Try using the Disc tool to make an elliptical tube in stead of a bar and setting Edges to Transparent with a Threshold of 2 - 10 -- Editors).

## 1.69 Morphing Particle Volumes

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### Morphing Particle Volumes

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QUESTION: Is it possible to create an object, make its shape into particles and then create another object with different shape, but with the same # of particles and then morph both of the one particle object into the other? In other words, particle morphing?

Creating objects filled with particles is pretty simple:

Use Modeler's Point Distribution macro to create lots of points in a sphere. Use the object that you need to fill with particles as a cookie cutter and use the AND boolean function between the object and the mass of particles. You will be left with only those particles contained within the object's shape

(Do this for each object volume and make sure the same number of points are in each volume. If not (most likely) then add the required number by hand. -- Editors)

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## 1.70 Tips On Surface Morphs & Chrome

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### Tips On Surface Morphs & Chrome

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QUESTION: I want to do a morph between two objects. The only problem is, the morphed object takes the parent object's surface. What do I do?

Turn ON the Morph Surfaces button. Surface settings are fully morphable, but only between a source and ONE target, i.e. you can't do morph sequences.

QUESTION: What is a good method of creating a believable liquid chrome surface? I haven't played with chrome textures, but I think that if a liquid object had its polys tripped and subdivided that you could then use a Displacement Map on it to get a true rippling chrome look.

The fractal reflections image included with the Toaster used as a Reflection Map combined with a fractal Bump Map with the texture size set at around 1/100 the size of the surface will yield a decent chrome.

## 1.71 Wrapping A Flat Polygon Into A Sphere

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### Wrapping A Flat Plane Into A Sphere

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QUESTION: I saw a cool demo tape where somebody took a map of the earth on a flat plane and morphed it into a globe, but it was done perfectly! How was this accomplished?

The Wrap-To-Sphere Modeler macro does a fine job of turning a flat plane into a sphere.

One trick in using Wrap-To-Sphere macro is to rotate the original flat plane 180 degrees on the Y axis (if the plane is in the XY axis, for example) and resave it as the source object AFTER running the Macro. This avoids the "implosion" look to the morph.

You also have to start off, before using the Wrap-To-Sphere macro, with the polygons of the flat plane facing the away from the camera.

Another idea you might try is careful use of the bend tool to create a cylinder from the flat plane as an intermediate morph to the macro-created sphere; this allows more control and generates a more pleasing morph.

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```
Wave Spd = 0.025
Band Shrp = 4
```

```
Transparency = 0% -----> Texture = Fractal Noise
                               Size   = 0.5, 1, 0.5
                               Velocity = 0, 0.25, 0
                               Value   = 100%
                               Freq    = 4
                               Contrast = 4
```

Add a second plane the same size just behind with these settings:

COALS

```
-----
Color      = 255, 200, 70 --> Texture = Fractal Noise
Luminosity = 90%           Size   = 0.5, 0.5, 0.5
Diffusion  = 50%           Velocity = 0, 1, 2
                               Color  = 95, 30, 0
                               Freq   = 4
                               Contrast = 1
```

```
Transparency = 0% -----> Texture = Underwater
                               Size   = 50000, 50000, 50000
                               Center  = 100, 100, 100
                               Velocity = 0, 2, 0
                               Value   = 100%
                               Wave Src = 10
                               Wave Lgth = 30
                               Wave Spd = 1
                               Band Shrp = 10
```

This yields very realistic fire. It could be adapted for explosions as well.

## 1.74 Making Light House Light Beams

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 Making Light House Light Beams  
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QUESTION: I'm trying to make a beam of light that rotates for a lighthouse. I made a cylinder and tried using a transparency image map to create a gradient so the light would fade in the distance, but this hasn't worked right. How is this done?

Here's a real simple way to get what you want...

Assumeing that your light beam is made of two cylinders, one for each direction, and that it was modeled in the XY view so that the length lies on X, AND that their pivot points are on the origin (0, 0, 0), AND that each has a DIFFERENT surface name like "beam1" "beam2", AND each is saved as separate objects, do the following:

What you need to know first is exactly how long one beam is on the X axis (use Automatic Size to get an exact measure). Let's say for instance that it's 500 meters long.

For the LEFT HAND side beam (the one extending in the minus X direction):

In Layout use the GRID texture for a Transparency Map with a Line Size of 1 (100% coverage, no holes) on the X axis. The Texture Size is null and void in this condition so just ignore it.

Next, divide 100 by the length of this object (this example:  $100/500=0.2$ ) and enter this value for an X axis Falloff. This causes the "Grid," which is now really just a plain solid surface, to become a gradient, starting at 100% texture and falling off 0.2% per meter so that at the end of 500 meters the texture has completely fallen off to 0%. If you need the beam to remain "solid" longer, just double the falloff value or increase it value to suit your needs.

Now you have to place the center of falloff at the END of your beam. Do so by entering the NEGATIVE value of the beam's length on the X axis for Texture Center.

Here's the trick. Set TEXTURE value to 100% (meaning the end will be 100% transparent) and set the actual TRANSPARENCY value to 0%. In this way the texture is a gradient map telling Transparency to go from 100% to 0% transparency.

If you need the beam to be see-thru even at the source, then simply set the Transparency value to a higher value, instead of 0%.

Set the edge treshold to 2 and edges to Transparent.

Set luminosity to 100%.

TIP: If you want the appearance of haze or fog in the beam, then use a Luminosity Map of fractal noise with a suitable size and about 80% value. SET WORLD COORDINATES 'ON' so that the noise DOES NOT travel WITH the beam as it rotates, the beams slicing through the texture, instead.

Surface Color will give you the color of the light you want.

The only other thing to do is REPEAT the above for the second right-hand beam, remembering to "reverse" the polarity of the setting for Transparency Texture Center, that is, instead of a negative value on the X axis, use the positive value of the beam's length. This will move the center of the falloff to the start end of this beam. The falloff occurs in BOTH directions, so by moving it to this end, you'll get the other side of the falloff and not have to change any of the other settings.

That's all there is to it! AND it doesn't take up any RAM

since there's NO image map involved. Of course, you'll want to put a real spot light with a suitable flare at the source of each beam... just remember to set an Intensity Falloff value of say 1% on each light (intensity=100%) so that the lights are completely faded out at 100 meters, instead of affecting everything out to infinity!

## 1.75 Making Star Trek Deflector Shields

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### Making Star Trek Deflector Shields

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QUESTION: I'm trying to create a deflector shield effect similar to that seen on the modern Star Trek series. You know, the egg shaped object around a ship that glows when hit. I can create the glow by fiddling with the Transparency envelope of the "egg," but is there a way to make it glow in just one spot? (maybe some specular setting or something along with a light source?)

Basically, make a 3D shield object, egg or whatever, then in a paint program and make a grayscale circular gradient from white to black. Use it as a Transparency or Luminosity map (its ONE of them), then just fool around with the texture coordinates until you get it at the right spot [the blast].

(In fact, if you use DeluxePaint, you could make an anim of the impact zone (gray scale) showing the firey dispersal of the energy along with a fractal noise texture with a large velocity and some falloff. You may need to have TWO shield objects, one slightly larger than the other. The inner one should have the fractal noise as a Transparency map, the outer one should have the animation sequence as both a Transparency and Luminosity map. -- Editors).

## 1.76 Making Displacement Mapped Canyons

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### Making Displacement Mapped Canyons

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QUESTION: What is a good method of creating canyon cliffs?

Simply clear TPaint to white and used a black brush to carve out trenches. Then use various settings of transparency using Darken to get thin gradients from the black canyon floor to the white cliff tops. Add very light touches of gray "air brush" to add bumps to the canyon floor and the plateau tops and to cut water gullies, notches, and mounds.

Save this quarter-screen sized image as a brush, take it into Adpro and reduce to a 256 step gray-scale, then Displacement Map it on to a 100 x 100 meter, 20,000 polygon triangle

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mesh. Planar and Bump image map it using your favorite rock texture.

## 1.77 Correcting Flipped Image Maps

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### Correcting Flipped Image Maps

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QUESTION: Why would a PAR sequence mapped onto a flat plane be flip? Viewed from the PAR the grabbed video looks fine, but when applied to a plane (single flat plane) the image is flipped (left to right). The image is Cubic Mapped and the poly is a single sided type with double sided turned OFF.

I don't think the problem is with the PAR sequence, but the way the image was mapped. You say the image is to be on a flat plane? Use Planar image mapping. Cubic image mapping is for cubes and reverses the image on some sides.

> Even when I tried just a Planar map it remained flipped.

You could be looking at the back side of the polygon, if it is double sided. To flip it the other way, simply make your "width" axis negative. For instance, if you're Planar mapping on Z, you would make your X texture size a NEGATIVE value. This will flip the image left to right.

## 1.78 A Procedural Texture Water Fountain

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### A Procedural Texture Water Fountain

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QUESTION: I have a fountain on top of a pyramid and want to make flowing water spray from the top. What's the best way to create one? Particles?

For the water fountain, particles certainly help the effect and Sparks will do the trick. If you can't afford Sparks, there is a PD program called Particle Fountain that will do a similiar effect but obviously with less features.

However, you don't have to use particles as particles by themselves will not do a complete water fountain with spray. For that you can use a fractal noise transparency. Map it onto a cylinder and give the texture a positive Y velocity. Then create a morph target for the cylinder by succesively pulling down the topmost points of the cylinder to form a fountain shaped sheet of water object. The positive Y velocity will now curve back down to form the parabola of a water trajectory. By playing with the transparency values and also using a moving fractal noise specular texture you can mimic the spray of water with a static object.

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## 1.79 Making Lightning-Like Neon Objects

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### Making Lightning-like Neon Objects

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QUESTION: I'm trying to do some neon-like stuff ( it's not really neon-like, it's more lightning-like energy rays going around an object). Any way to get objects to glow?

Use the Sketch tool to draw a zig-zag, bent-wire-like line in one layer. Make a flat disc that is the right diameter for your lightning-like objects in another layer and rotate and position it at the start of the sketched line in the BG.

Rail Extrude the disc. This will give you a tubular version of your lightning-like object. Surface it as "LightningGlow" or something similar. Redo the above extrude, but use a flat disc that's 1/3 to 1/4 the size. Surface the result as "Lightning." Put both of these objects in the foreground and save them as one object.

In Layout, surface the outer glow tube like this:

```
Color same as the inner lightning object
Additive ON
Luminosity 100%
Diffusion 0%
Transparency 40%
Smoothing ON
Edges to Transparent
Threshold > 2
```

Surface the inner tube like this:

```
Luminosity 100%
Diffusion 0%
Transparency 0%
Smoothing ON
Edges to Transparent
Threshold > 2
```

This will make a nice glow around the lightning. If you make your disc with 8 sides, it shouldn't take that long to render.

A similar technique would work for a glow on a neon sign.

## 1.80 Making Spotlight Beams

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### Making Irregular Shaped Light Beams

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QUESTION: I would like to put a light inside a planet and make a state or country transparent in a manner that I could

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see inside the planet as a light beam comes out, projecting light streaks all over the place in the shape of the outline I think that this is not too difficult if I use the 'light beam trick,' but I want the beam to be 'broken' as if dust was in the air. How can I do this?

Here are some ideas:

Planet:

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Make a tessalated sphere in modeler or use the planet that came with LW. Be sure to give the planet a surface name like "planetsurf" (if you use the one that came with LW, be aware that it is constructed of two spheres, one as the planet and one slightly larger for the atmosphere).

You may wanna use this and you may not depending on the type of scene you need.

Planet Map:

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If you don't have a planet map, go into your paint program and paint the planet's terrain as if it were flat. Make sure the left and right edges (also top and bottom) connect and match up when wrapped around the sphere. Save this map as something like "Planetmap.iff."

Now paint Black (on this same image) the section of terrain that you want to be transparent. Make sure that nothing but the section that you want to be transparent is black. Save as "PlanetTrans.iff" and import it into something like Adpro and convert to a grayscale image and resave under the same name.

Mapping:

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Load the planet object and the two planet maps into Layout. Go to the surfaces menu and select Planet surface, then under the surface color section, choose 'T' and use your "planetmap.iff" as a spherical image map. Choose Automatic sizing and Ok.

Under the transparency section choose 'T' again and use the "PlanetTrans.iff" as a spherical transparency map, auto size and Ok.

Surface:

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You can get as detailed as you need, but for simplicity, use the default surface settings and add doublesided and smoothing. Now the black area of the planetTrans map should give you a transparent hole for that section of the planet.

Lightbeam:

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I'm not sure what kind of light beam you're looking for, but here is what my first impression was. Go into Modeler, load



the planettrans map as a back ground image (on the Y axis - Editors). With the point making tool, simply outline the black section of the map with points in a clock wise direction. Choose make.

Now that we have a polygon in the shape of the black section of terrain (you can turn the BG image off now), choose the extrude tool and extrude this polygon to the desired length (on the Y axis - Editors).

Enlarge the top polygon to the desired beam angle dimensions to achieve the 'V' shape of a light beam. Surface it as "Planetbeam" and save the object by exporting it out to Layout as "PlanetBeam.lwo." Once in Layout, position the beam properly at the right location of the planet.

Lightbeam surface:

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Choose smoothing, additive, transparent edges and doublesided. Set the desired color for the beam.

Choose 'T' beside Transparency and use the Grid texture (with a Line size of 1 - Editors) as a gradient (transparency) map (with a falloff value calculated by dividing the Y axis length of the beam by 100 and a center value on that same axis equal to its length - Editors). A texture value of (0% and a Transparency value of 100% - Editors) should do it... This will make the beam brighter at the light end and fall off towards the other end. Play with the settings (if the effect is reversed - Editors).

To break the beam up as if dust particles would do, set up a Luminosity fractal noise texture. You'll have to play around with the fractal sizes to get the desired effect and also the contrast and frequencies. (Set the Texture value at 100% and Luminosity at 40% - 60% - Editors). Set World Coordinates ON if you plan to move the light beam around. If not, and you want the dust itself to fly around, give the texture itself a velocity setting.

Final Touches:

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After saving all of the objects with there new surface settings, load a second copy of the planet and for this one remove the planettrans map. Save it as "PlanetPlain.lwo."

Set the two planets up to morph and turn the Morph Surfaces button ON. Use an object Dissolve Envelope to fade the lightbeam object in as the plain Planet morphs to the transparent hole planet.

Last thing to do is to put a light inside the planet with the desired flares and envelopes.

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## 1.81 Surface Settings For a Glass of Wine

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### Surface Settings For A Glass Of Wine

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QUESTION: I know how to make water in Lightwave, but I would like to make a glass of wine WITH WINE IN IT and I cannot figure out how to make realistic looking wine. The surface of the wine would be easy if I applied the same method as making water, but what about the rest of the wine? We should be able to see the whine through the glass, and MOVING. What settings are suggested?

I have been working on a drink bottle for a few days and ran into all kinds of problems but have since solved most of them. For a nice looking liquid I set the appropriate color for the drink. I used '0' for Luminosity, Diffuse level, Specular level, and Reflectivity (since mine was in a bottle, I gave the specular and reflective values to the bottle itself, not the liquid, but in your case you may need to give both of these some values). I used Transparency 85% and gave it a Refractive Index of 1.2 with Color Filter, Smoothing, and Double Sided ON. When rendering make sure you turn on Trace Refraction. My bottle has a 98% Transparency, a Surface Color of 225, 225, 225, 100% Luminosity, Specular level 100%, Glossiness = High, Refelectivity set at 15%, Refractive index 1.1, and I turned Color Filter ON, Smoothing, and Double Sided. I used shadow maps to cast a shadow and the final image looks excellent. Maybe you can incorporate some of this into your project. I just kept rendering test frames in low res, tweaking this and that each time until I got it right.

## 1.82 Dual layer Textures With Transparency

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### Dual Layer Textures Using Transparency

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QUESTION: What I'm trying to do is have the white part of an image be transparent to an underlying procedural texture and have the black part of the image superimposed on top of it. I've tried using a Transparency Map, but it makes the whole surface transparent where it's white, instead. What's the trick?

LW does not treat the various surface settings as separate, overlapping layers, but instead, as a hierarchy with Transparency being the highest (over-riding) attribute. Thus, to accomplish what you're asking requires that you have actual surface layers by making an slightly larger object from the original and use this to map your B/W image on to.

You can do this by taking your base object into Modeler and select all the polys assigned to the surface in question.

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Copy them to another layer and give them a different name, something relating to being a transparency. Put your base model in the BG and select a view that gives the clearest side view of the copied polys and model. SLIGHTLY move the copied polys out away from the center of the model, even a millimeter will do (use the Numeric button). If the copied polys surround the object (like a sphere), use the Size function and Numeric to increase the polygons a fractional amount, say a factor of 1.01 or so.

Save these polys as a new object and load it up along with the base model. Now you can use your Tx map OVER your underlying Surface map.

## 1.83 Making Seamless Texture Maps

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### Making Seamless Texture Maps

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Here's a good trick to render your own seamless Fractal Noise bitmap!

1. Start with a single rectangular polygon that fills your screen. Don't worry if it hangs off the edge.
  3. Create the surface you would like to have repeat including any fractal texture you want.
  4. Select Save RGB and render a frame.
  5. Run ADPro and load the image you just rendered.
  6. Use the Crop Visual operator to crop away all of the image EXCEPT for 50 pixels on the right side. Save this part of the image (50 x 480, if you used Medium Res) to the TEMP buffer.
  7. Load the original image again.
  8. Use Crop Visual to crop away the 50 pixels on the right side (leaving 702 x 480 in Medium Res).
  9. Set the Compose/Replace/Landscape cycle gadget to Compose (ADPro 2.5 only).
  10. Open the Backdrop Loader.
  11. Set Type to Gray, Mode to Gradient, Width to 50 and Height to whatever the height of the image is.
  12. Set the color of the two left rectangles to white (value 255) and the two right rectangles to black (value 0). This will create a grayscale gradient spanning 50 pixels from white to black. Select OK.
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13. The ADPro Composition Screen opens up. Select As Alpha.
14. When control returns, load the TEMP buffer.
15. The ADPro Composition Screen opens up. Make sure X and Y offsets are 0, Mix is 100, and Alpha is set to Alpha Memory.
16. Select Compose.
17. Save your finished image.

Why is this seamless? You've effectively rolled the image into a cylinder with a 50 pixel overlap. Thanks to the Alpha channel gradient, the left edge fades in as the right edge fades out.

A similar procedure can be used to make the top and bottom seamless, also.

If you find that 50 pixels looks rough on your textures, adjust accordingly: you can create a gradient up to 256 lines wide without repeating a single color, and thus have a wide, perfectly smooth fade from one edge to the other.

There's also a fairly easy way to do this in Toaster Paint, if you don't mind trying to work around the 1/4 screen limitation.

## 1.84 Diffuse And Specularity Interactions

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### Diffuse And Specularity Interactions

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QUESTION: How does Diffuse interact with Specularity and shadows?

Here is a quick way to think about the different surface attributes.

Picture a wooden ball. It's fully diffuse (light reflects off the entire surface). Paint it with varnish. It's now less diffuse. It gets "generally" darker, yet has the same color as before as you look at it where the light is directly perpendicular to the surface, but gets darker faster as the angle of incidence to the light increases). Now, buff that ball a little, and you start to see a foggy highlight. You have now increased the specularity. Polish the ball until you get a tiny, hard highlight. You've now increased the gloss, yet the diffusivity and color remain the same. Generally, the only time you'd reduce the diffuse setting on a surface is if you're trying to make it look varnished or shiny (shiny objects are never 100% diffuse). This goes hand in hand with the specular setting which determines the kind,

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size, and highlight strength the surface will have.

## 1.85 Using Additive Surfaces

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### Using The Additive Surface Button

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QUESTION: What is the Additive button on the Surface Panel good for? What exactly does it do, and what would be a possible use of it?

Lightwave Layout page 28 explains it all. It has been used successfully to create static electric fields by setting the object to black and applying a texture like Underwater with a light blue color and setting Additive ON. The manual gives another couple of uses for this setting.

## 1.86 Simple Clip Mapped Christmas Tree

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### Simple Clip Mapped Christmas Tree

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Christmas tree:

What you need is an image of a tree. Make yourself a christmas tree shaped image, black on white. Using your favorite software, throw it through some sort of noise filter so that the black shape is still noticeable but it has grey and white holes all over it. The best way I can explain this "look" is the way the shadow of a tree looks during the summer, with the sun shining through the leaves. Try and leave it more solid towards the center (to simulate the trunk and increased density of leaves)

You will use this as a clip map in LW by taking 2 flat polygons and intersecting them at right angles. You'll have an extruded X shape. Clip Map your polygons with the image you created and set the surface color to a dark green. Now, when you view the tree at most angles (except from below or above) it will look just like a tree. BTW, this only works for trees at a distance from the camera... if it's going to be close, you either need more than two polygons intersecting, or you need to build a tree model... for this I'd suggest maybe looking for an arexx macro to do this...

There is no snow on this tree, so you might want to use a surface color map of the same image but colored so that there's a brown trunk and green and white leaves... then you might want to add some fractal noise as a diffuse map to "dirty up" the tree a bit... making it look more realistic. Under the clip map settings... make sure antialiasing and pixel blending is off... you also might need to toggle nega-

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tive image, depending on whether your original image was black on white or white on black.

## 1.87 Making 2D Cutouts With Clip Maps

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### Making 2D Cutouts Using Clip Maps

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QUESTION: How do I import an image or brush into Layout and convert it into a 2D cutout following the edges of the image (like a tree) rather than rendering the whole polygon?

Make a version of your brush in a paint program that is pure white where you want the tree to be, and pure black where it isn't. Now, save your brush with the same name and file extension .clp and use this brush as a Clip Map on a flat polygon object with Negative Image toggled on and no anti-aliasing or pixel blending (they cause problems with clip maps). Use your original brush as a planar image map with the same dimensions as the clip map and only the tree will be rendered.

## 1.88 Good Default Environment Scene

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### Good Default Environment Scene

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QUESTION: I have tried setting up a default scene which includes a ground object, a sky object w/clouds, and 2 lights that simulate sunlight. What are some suggested light settings and positions for these objects?

Step 1: In Modeler make a polygon 8 Km square, centered at 0,0,0. Change the surface name to "Ground" and save the object as "Grassy\_Field".

Step 2: Move the square in Modeler so that the Y value is 1000 meters. Flip the polygon. Change the surface name to "Sky" and save as "High\_Stratus."

Step 3: Go to Layout, load these two objects. Set the Camera position to 0, 1.6, 0 (for eye level) and create a key. Change the grid size to 10 or so.

Step 4: Go to the Effects menu, and enter the following:  
Turn off Solid Backdrop,  
enter these values for the backdrop colours:

```
Zenith: 15, 75, 125
Sky:    190, 190, 200
Ground: 190, 190, 200
Nadir:  15, 75, 125
```

---

Gradient Squeeze: 5, 5

Turn on Backdrop Fog, and choose Non-Linear 1.  
Set the maximum fog distance to 15000.

Step 5: For the grass, make these surface settings:

Colour: 80, 154, 59.  
Colour Texture: Fractal Noise  
Texture size: .2, .2, .2  
Texture Colour: 68, 91, 43  
Frequencies: 3  
Contrast: 1

Bump Map Texture: Fractal Bumps  
Texture Size: 100, 100, 100  
Texture Amplitude: 50%  
Frequencies: 5

Step 6: For the Sky, make these surface settings:

Colour: 255, 255, 255  
Transparency: 50%  
Transparency Texture: Fractal Noise  
Texture Size: 300, 300, 1200  
Texture Value: 150%  
Frequencies: 5  
Contrast: 1.5

(Remember to SAVE OBJECTS to anchor these settings to the objects)

## 1.89 Creating Electric/Static Fields

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### Creating Electric/Static Fields

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QUESTION: What settings for the Marble texture creates a static electricity-like field? I've gotten the Underwater texture to look pretty good, but think a bit of Marble velocity could accent or generate a totally new effect.

Here are some settings and suggestions:

Copy object and size it slightly larger than the original and give it a new surface name like "static." Use polygons and select half the object and name it "static1." Parent the object to original. Your original object probably has many surfaces, the slightly larger object only has two surfaces (for nice variations try slicing the object in to irregular shapes with surface names 'static2, static3... etc).

Settings depend highly on your object, which direction...etc

```
SURFACE 0,0,0 --> Texture = MARBLE
                TEXTURE CENTER Y = -5.0
```

---

```
T-FALLOFF Y = 10%
T-VELOCITY X = .01, Y = .01, Z = .07
TEXTURE COLOR = 224 201 0
FREQ= 3
TURB= 0.5
V SPACE 0.5
V SHARP 6.0
```

```
LUMINOSITY 200%
ADDITIVE ON
EDGE = TRANSPARENT
SMOOTHING ON
```

Now, do the same for "static1" but when you get to Texture velocity give it a negative direction. As you can see by having more than one surface we can give the illusion of bi-directional travel. If the object had more surfaces we could use an envelope to fade the texture in and out while changing the velocity (X,Y,Z) for each location. This gives the static energy discharge a little bit of presence.

## 1.90 Making Depressed Foot Prints

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### Making Depressed Foot Prints

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I have used grey scale anims of foot prints as Bump and Displacement Maps. Create the anim of the prints using Dpaint brush options to create gradient fills. Make two prints for left and right foot. Make simple brush anims of foot prints and stamp them along as big a picture as your memory allows. I used the anim as a Bumb Map for wide shots and the Displacement Map for zoomed in shots. Also I was creating an invisable man. If your object making the prints is visible, I would use the Displacement Map, allowing you to see the print for positioning.

## 1.91 Creating Force Fields

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### Creating Force Fields

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QUESTION: How did they create the electricity effect on Babylon 5 when a StarFury was disabled by a Minbari cruiser?

Mojo writes, in Lightwave Pro, that you use the Underwater texture on a slightly larger version of the object you want to have the electricty on. He mentions to change the Surface Color to black, select a bluish tint for the Underwater Color and make sure the object is Additive, which will cause anything black to be transparent and anything that's not (the water effect) to show up. You then parent this

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larger version to the original.

## 1.92 Simulating Backlighting Glows

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### Simulating Backlighting Glows Pre LW 4.0

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QUESTION: Is it possible to make object surfaces become lights?

Unfortunately, multiple light sources become computationally intensive very quickly. Therefore, unless you're running LW on a DEC Alpha or a Raptor, chances are you should avoid area or diffuse lighting like the plague!

One trick to give you the effect you want, for backlit letters for example, would be to use a Luminosity Map on the background behind them to simulate the light shining on it. You may also need to use a color map to desaturate the lit region if the glow is supposed to be very bright.

## 1.93 Studying Grid Value vs Falloff

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### Studying Grid Value vs Falloff

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It should be understood that grid spacing values represent the proportion of the texture size that the grid covers, ie, 0.5 is half the area, 0.75 is three quarters, 1.0 is all of the area, or a solid texture. If this is true, going above Line Size = 1 should not affect Falloff, since Falloff only affects the VALUE of the texture, not any of the other parameters.

However, following is a table that seems to demonstrate otherwise. The Grid Texture was rendered once with a Grid Size of 1 and a Falloff of 50%, and once with a Grid Size of 2 and a Falloff of 50%. No difference was seen. However, if you want a texture to start falling off a few meters from the center give it a texture value above 100%. Look at the comparison table.

(this one starts falling off VISUALLY at 1.5 meters)

| Texture Value | Texture Falloff | Value at |      |    |    |
|---------------|-----------------|----------|------|----|----|
|               |                 | Center   | 1M   | 2M | 3M |
| 100%          | 50%             | 100%     | 50%  | 0% | 0% |
| 400%          | 50%             | 400%     | 200% | 0% | 0% |

---

(this one STARTS falling off VISUALLY at 3 meters)

|      |     |      |      |      |      |
|------|-----|------|------|------|------|
| 100% | 25% | 100% | 75%  | 50%  | 25%  |
| 400% | 25% | 400% | 300% | 200% | 100% |

(this one STARTS falling off VISUALLY at 2.25 meters)

|      |          |      |        |        |    |
|------|----------|------|--------|--------|----|
| 50%  | 33.3333% | 50%  | 33.3%  | 16.7%  | 0% |
| 100% | 33.3333% | 100% | 66.7%  | 33.3%  | 0% |
| 400% | 33.3333% | 400% | 266.7% | 133.3% | 0% |

(assume a grid texture with grid spacing of 1)

Notice that the falloff in all cases is ABSOLUTE. That is, a 50%/meter falloff will reduce 100% to 50% in 1 meter, and 400% to 200% in one meter. So the 50%/meter means "reduce by 50% OF the value", NOT "subtract 50% FROM the value."

## 1.94 Using Grid Falloff

### Using Grid Falloff

The trick in working with the Grid Texture to make gradients using Falloff is to not think of the texture as a grid, but as a SOLID plane IF AND ONLY IF the grid line SIZE is set to 1 (100%). After that is done, Texture Size has NO effect on it, so it doesn't matter what they are set to.

Use Automatic Size to get the length of the object you want to apply a gradient to, end to end. The axis with the largest value is usually the same axis for the falloff value. The size value on this axis is also valuable in setting the Texture Center value. Use it to place the start of falloff at the far end of your object if its other end lies on Modeler's origin (0, 0, 0). Otherwise, use one half the value if the object is centered on 0, 0, 0. A negative value can be used to move the texture's center to the opposite end in these cases.

To calculate the Falloff Value, divide 100 by the length of the object as given in Texture Size by Automatic Sizing. This maps the falloff from 100% to 0% over the full length of the object. If a shorter gradient is desired simply increase the Falloff value; a longer gradient, decrease the value.

## 1.95 Realistic Lake Water And Waves

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Realistic Lake Water And Waves

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QUESTION: What is a good way to create good looking lakes?

Create a 1 meter square polygon, triple it, Array Clone it into a 100 x 100 mesh of a couple thousand triangle polys, and Merged Points. Displacement Map it using Ripples with 2 to 3 frequencies, an amplitude of 20-30%, and a wavelength and speed to match the size of the object. Using this method allows you to SEE the actual effect of the mapping in a wireframe preview.

Next, Surface Color it a lovely shade of blue, a fractal noise texture color slightly darker than the main color, a fractional velocity on the Y axis so that the shape of the texture changes as it intersects the mesh, a 50-80% medium speculativity (no color highlights), and 100% diffusion.

Then apply a fractal noise Bump Map texture at 100-200% amplitude at 1/10 - 1/20th the Surface Color fractal noise texture size and with a Y axis velocity at 5 times.

Place a Point light in front of the camera a couple 'hours' above the water's surface with lens flares ON set to Central Glow active only at 50-70%.

Renders show a nicely rolling, sparkly surface like a calm lake with 1 to 2 foot waves. The Bump Map is really the texture that makes it work, simulating the random choppiness of water while displacement ripples gives the gentle undulations of the slower larger waves.

## 1.96 Making Laser Beams

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Making Laser And Light Beams

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### LIGHTBEAMS

Simply make a 1 meter long DISC with 32 "sides" along the X axis. Select all the points of one end and STRETCH them equally in both directions so that they form a much smaller CIRCLE, giving you a truncated cone. CUT the two "end cap" polygons and apply a surface to the remaining side polygons something like "spotlight" and save or export this object as "spotlight." Center the small end at 0, 0, 0.

In Layout, define your spotlight object's surface:

```
Surface Color: (whatever color you want your lightbeam)
Luminosity: 100%
Luminosity Texture: Grid -- Falloff: 100 on X axis
Line Thickness: 1
```

---

Texture Value: 0%  
 Additive: On  
 Diffuse: 0%  
 No Specularity  
 Edge: Transparent  
 Edge Threshold: 2

The Grid texture creates a smooth falloff for Luminosity, getting darker until 0% luminous at the wide end of the lightbeam. Additive is a neat way to fake transparency. Any part of an object's surface that's BLACK is 100% transparent to anything behind it. So, with the Grid texture creating a gradient falloff to black, the lightbeam becomes progressively transparent without having to set up the Transparency Texture. The Edge setting of Transparent makes the sides of the lightbeam fuzzy instead of hard.

Now PARENT the small end of this object to your light (type=spotlight) and rotate it to match the beam's direction. Set the light's cone angle and edge to 10 degrees each.

#### LASERS

Make a V E R Y L O N G tube using the DISC Tool, default 16 sides. COPY and paste this down in the next layer and STRETCH the diameter to twice as large as the original. Select the first layer and surface the small tube beam as "InsideLaser." Select the next layer and surface the larger object as "OutsideLaser." Save or export as "LaserBeam."

Define the inside surface using Surface Color Fractal Noise, Luminosity 100%. Surface the outside using Transparency Fractal Noise at 100% Value, Edge to Transparent, Threshold = 2, Surface Color same as the inside color (or maybe something just a bit different), and Luminosity at 100%. Set each Fractal Noise velocity to a large setting so that the texture moves a large distance from frame to frame on whatever axis the tube was created.

## 1.97 Using An Image Map To Make Bricks

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### Using An Image Map To Make Bricks

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QUESTION: I need a 100 x 200 ft split-faced block wall (8" x 16" cinder block with an uneven rough face). How do I create one?

What you are going to have to do is to create a "repeating" bitmap to make the bricks. You can control how many times the map repeats by adjusting its Texture Size in the Texture control panel in the Surfaces menu.

Let's do the math: you have a wall that is 200 ft wide, and blocks that are 16" wide so, there will be 150 bricks across

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the face of this wall. The wall is 100' high and the bricks are 8" tall so, there will be 150 bricks up the face of the wall.

Let's say you create a nicely detailed bitmap that has 2 bricks across, and 2 bricks tall. You don't have to worry too much about the relative proportions of the bricks, but they should be fairly close to what you want. It would look something like this:

```

-----+-----
      |
      |
-----+-----+
                      |
                      |
-----+-----+

```

Make sure that when this map is butted up against itself on all 4 edges that it tiles perfectly with no visible seam. Keeping the mortar at the edges will help accomplish this.

Now, you have to position this on your wall. The trouble here is that you're working with inches and feet and Layout is strictly metric. This is no problem though -- you don't have to do any conversion. Simply do this... apply your bitmap to the wall, and choose "Automatic Sizing". This will take your 2 x 2 brick map and stretch it to cover the entire wall. Then, go into the texture size, and you'll see something like so:

```

X  60.96
Y  30.48
Z   1.0

```

What you need to do is to divide the X and Y numbers by 75 (150 is the number of bricks we need, and half of that because our bitmap is 2 bricks wide and tall). So, plug in these values:

```

X  0.8128
Y  0.4064
Z   1.0

```

Your wall should now be completely covered with appropriately sized bricks in perfect scale.

## 1.98 Making Neon Font Outlines

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### Making Neon Font Outlines

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QUESTION: I've been experimenting with creating glowing, ie. neon-lit objects, by extruding 2 disks along a path. What I'd like to do is use some regular PS fonts. The problem is

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how would I create a slightly larger copy of the text? The Size and Stretch functions will enlarge the font, but what I really need is an outline?

The easiest way to do this is by doing a bevel operation on the PS font. Make your letters with the Text command, then bevel the flat faces. Use a negative inset value to make the bevel come out LARGER than the letters (as opposed to the normal bevel's function, which is to make them smaller). Make sure you still assign a shift value so it'll be easier to select the polygons you'll want to keep. Next, select the polygons you don't want with Volume Include and Kill (k) them (this may possibly make some 2-point polys you'll have to delete from the Stats/2 sided panel).

The catch: this will only work if you need to enlarge something FLAT (like a normal bevel would be good for). The only way to make a path for the extrusions would be to select the outer points making up the bevel manually (in the correct order).

## 1.99 Making Babylon 5-Like Nebulas

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### Making Babylon 5-like Nebulas

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QUESTION: Anyone know how Ron Thorton makes those BEAUTIFUL Babylon 5 nebulas in LightWave?

One way is to paint the nebula in a 24-bit paint package using a spray paint or some other tool that paints with soft edges.

(Map it as a Luminosity and Transparency Cylindrical Map on an object made from half of a 1000 Km diameter sphere that has all but two rows of polygons above and below the "equator" cut. Set the Width Tiling to 2 so that the full width of the image fits into the 180 degree arc of the object it's mapped onto. -- Editors)

## 1.100 Sand Storms Using Procedural Textures

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### Sand Storms Using Procedural Textures

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QUESTION: I'd like to make a storm of some kind with wind blowing dust around and I don't know how to create this.

A moving fractal noise texture used as both a Color Map and a Transparency Map should do the trick used on sphere surrounding your pyramid. Depending on your camera placement, you might want to use more than one. If the camera is placed

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inside the sphere be sure and flip the polygons inward.

Study the cloud texture in the texture examples scene to get ideas on how to do this.

## 1.101 Making A Desert Landscape

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### Making A Desert Landscape

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QUESTION: I'm trying to make a desert-like landscape like one I saw on an Aminet animation called Waves. It used Displacement Mapping to give a flat plane a rippled surface. I've fiddled with this, but I can't seem to get the hang of it. How does Displacement Mapping work?

First Question... What are you using for your flat plane? A single square poly WON't work! You need a dense mesh of triangle polys so that their vertices can be displaced by your image map or procedural texture. To make one, make a 1 meter square flat poly, then triple it. Array Clone it to make a mesh grid (100 x 100). Don't forget to MERGE POINTS!

Displacement Mapping moves the VERTICES of polygons, deforming them to fit the luminance values of the image or procedural being mapped. Without thousands of points, Displacement Mapping can't work its deforming magic. Thus the reason a single poly with only 4 points can't be deformed.

Here's a tip... after setting up a Displacement Map using the RIPPLES procedural on this large 100 x 100 meter mesh of polys with a pleasing "ripples in the sand" effect, "Save Transformed" as another object. Now take this new "deformed with ripples" object mesh and apply to IT a Displacement Map of fractal noise on a large scale and amplitude in order to create your dune structures, the ripples "riding the waves."

## 1.102 LightWave And Toaster Specific BBS's

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### LightWave And Toaster Specific BBS's

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Here are several BBS's that I call frequently and are worth every penny.

Ron Kramer's Obstical Illusion: (616) 791-2109 (Michigan)

The Lightwaved BBS: (510) 228-0886 (Florida)

NewTek's BBS: (913) 271-9299 (Kansas)

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## 1.103 NewTek BBS Number

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NewTek's BBS Number  
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QUESTION: What's the number to the Newtek BBS?

Newtek BBS : 913-271-9297

(also mirrored as an Internet FTP via ftp.newtek.com

login name = ftp, login pswd = your email -- Editors)

## 1.104 Paths From An Extruded Object

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Motion Path From An Extruded Object  
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QUESTION: I know you can take a camera or object motion path and create an object that follows that path, but is there a way to create an object first and then create a motion path for the camera that follows the shape of the object? I want to create the object first, then have the camera move through it.

If you create your object with a curve (ie via rail extrude) the Path-To-Motion macro will take that curve and write out a motion file.

## 1.105 Saving A Scene Layout As One Object

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Saving A Scene Layout As One Object  
-----

QUESTION: Does anyone know of a utility that will save a Lightwave scene's objects as a single object? If not, how can one save all the objects in a scene as one object, without having to rebuild/reposition them manually in Modeler?

- 1: Load up the scene you want to save as a single object.
  - 2: Go to the Objects menu, and for each object in the scene, use the SAVE TRANSFORMED function to save it under a simple temporary name in a common directory.
  - 3: Clear the scene, and enter Modeler.
  - 4: Load each object you just saved from Layout into Modeler, in ONE layer. Since you saved them from Layout with SAVE TRANSFORMED, the objects will load into modeller with the size, orientation, and placement they had in layout.
-



5: Save this new object out.

Note that this will affect any bitmap placements on object surfaces, and may affect various textures as well. You will likely have to reload the new object into Layout and inspect and adjust some of the surfaces.

## 1.106 Saving Hollywood FX Objects

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### Saving Hollywood FX Objects

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Concerning saving scenes from Hollywood FX, when you install the program, it creates a "Work" directory in the Toaster directory. It should be something similiar for the stand-alone version.

In that Work directory, there are 3 directories: Images, Objects, and Scenes. The Images and Scene directories are accessible and filled at all times so you can access the scene directory at any time. The Object directory is empty.

Hollywood FX accesses the objects as it needs them for each individual scene it renders. This means that the only objects that are in the Object directory are the ones that Hollywood FX is using at that time. While rendering, Alt-M out of the render and use a directory utility to look in the HFX Object directory to get your objects.

Remember, after each render Hollywood FX deletes the objects from the Object Directory. If you want to save every object that Hollywood FX uses, you'll have to load each scene file and start to render, Alt-M out of the render, then save the temporary objects in use into a diefferent directory. You can then abort the render and start the next, etc.

## 1.107 The Internet LW Mailing List

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### Internet LightWave Mailing List

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Sent an e-mail msg to:

listserv@netcom.com

with the following in the body of the msg:

SUBSCRIBE listname address

where:

subscribe = the word subscribe,

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```
listname = lightwave-l ...for the LightWave list,  
          toaster-l   ...for Toaster list,  
address = YOUR internet e-mail address.
```

## 1.108 Common Errors From Boolean Usage

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### Common Errors From Boolean Usage

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QUESTION: Have any of you been getting the error message: Polygon Partitioning Error: Add Small Offset To Data And Retry Again? I get these A LOT when using the Boolean Union function. It usually happens when dealing with polygon counts in the thousands.

2 reasons and a tip:

Reason 1: Boolean functions REALLY don't like non-planar polygons, including degenerate polygons -- polygons in which more than one of the points occupy exactly the same coordinates.

Reason 2: Boolean functions aren't much happier with separate polygons for which one polygon has one or more points occupying the same coordinates as one or more of the separate (unmerged) points in the other polygon.

Merge Points in the area of the boolean operation for the operation, then break the polygons into separates again if that's what your model calls for.

TIP: Select only those polygons that will be directly affected by the boolean operation. This will generally speed up boolean ops tremendously, giving you that partitioning error without the wait. ;-)

## 1.109 Tips On Using Boolean Operations

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### Tips On Using Boolean Operations

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When using Boolean operators make sure you ALWAYS check for doubled points. Some operators leave 2 points where there was only one and some do not. Subtract is one of the them that does. Always Merge Points after using Boolean operators just to be sure.

## 1.110 Basics On Using Rail Extrude

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 Basics On Using Rail Extrudes
 

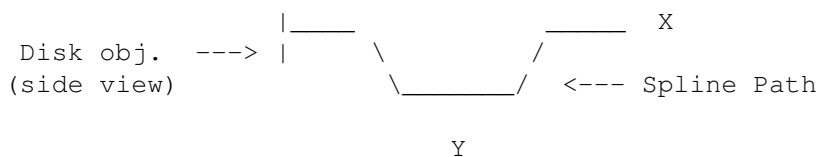
---

QUESTION: I got LWPro magazine, and spotted the tutorial on spline usage, but I didn't get as much out of it as I would have liked. What are some tips on Splines and perhaps a real application example?

Without getting too technical or detailed, here are some examples:

Making Handle bars for a bicycle:

Use the Sketch tool in the objects menu to make a curve in a handle bar shape, like this:



Below the Sketch button, select Make. Now that your spline rail is made, go to the disk tool and make a flat disk about 1" in diameter on the X axis like above. Be sure to make this in another layer with the spline in a background layer so that you can position the center of the disk exactly where the first starting point of the spline (indicated by the diamond symbol when you use Polygon select at the bottom of the screen).

Once every thing is in place, choose the Rail Extrusion tool from the Multiply menu. For now, just try the default settings and hit OK. The disk should have extruded along the spline curve, creating smooth bends in the bar (disk).

Note: If the polygons are turned the wrong way in the finished product, you can flip them back or flip the disk before performing the extrusion. Also, for a more realistic set of handle bars, try manually entering the points into position and then selecting the Curve button under the Tools menu to create a spline from the selected points.

Try pulling the ends of the spline into the negative Z axis and then perform the extrusion. If you do this, you'll have to reposition the disk so that it's aligned with the spline. The object that is to be extruded must be at the starting point of the spline, and whatever angle the object has relative to the spline, it will be maintained throughout the extrusion, so be sure to have it positioned properly.

With this technique in mind you could make the bicycle's frame, a water slide (by extruding a U shaped polygon along a winding spline), or a high banked turn for a race track (by extruding a short and wide rectangle).

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## 1.111 How To Make A Spring Object

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### How To Make A Spring Object

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QUESTION: How can I create a spring object?

Rail Extrude is what you want. Make a spiraling spline curve and in another layer with the spiral curve in the background layer, make a small disc and orient it so that it points along the path. Click Rail Extrude.

(Or, you could use this easier approach. Make a small flat 1 mm circle poly on the XY axis and offset -40 mm on X. Select Clone on the Multiply panel and under Numeric enter Clones = 360, Angle = 3600, Y axis Offset of 20 mm, and all other fields defaulted. Click OK, and Make. A perfect spiral spring having 10 turns and 36 sections per turn will be created -- Editors).

## 1.112 How To Make a Wood Screw

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### How To Make A Wood Screw

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QUESTION: I'm trying to model a screw and was wondering if anyone has any ideas on how to build the tapered part of it? How would you go about making the threads that winds down to a point?

Create a notch cross section using the Disc tool with only 3 sides so that it looks like "<".

Use the Lathe command with an offset equal to the height of the notch, an end angle of a say 3600 degrees (10 rotations)

Use Taper to "wind it down"

1. Make a flat triangle (use disk with 3 sides and no depth)
  2. Rotate it if needed so that one side is parallel with the axis of the screw.
  3. Move the triangle away from center in 1D, 1/2 the width of the base of the screw.
  4. Lathe 360 degrees with an offset of exactly the width (or less) of one side of the triangle. The offset determines the pitch of the screw. What you now have is, to coin a phrase, "one turn of the screw."
  5. Clone as many as you need to make up the length of the screw, offset exactly half the length of one turn.
-

6. Taper.

This will make a wood screw. For a machine screw use a trapezoid on it's side instead of a triangle and don't taper.

### 1.113 Making A Drill Bit Object

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#### Making A Drill Bit Object

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QUESTION: What's the easiest way to make a drill bit object?

Create a bit cross section by making a flat disc with 2 half circle notches cutout on either side. Extrude it with lots of segments, then use twist to make the notches spiral down the length.

Finally, use a boolean subtract to cut a point on the tip. Make sure to triple all non-planar polys before the boolean.

### 1.114 Using Toaster Arexx and Modeler Macros

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#### Using Toaster And Modeler Arexx Scripts

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QUESTION: Can someone tell me how to use the Arexx port of the Toaster and LightWave's Modeler?

What you need to do is doubleclick on the RexxMast icon (for os/3.0). It's probably best to just drag it into the WBStartup drawer so that it executes on startup. You can find RexxMast in the WorkBench system drawer.

Most of the LW scripts are run from Modeler along with all of the Modeler scripts. To do this you have several options.

- 1) Click and hold the Macro botton in Modeler's object menu. You will see a list of macros (arexx scripts). You can pull the mouse down through the list untill you reach the one you want to run.
  - 2) At the top of this list, you will see these options:
    - Configure List, Configure Keys, Direct Command
    - A) Configure List allows you to add/delete, along with a few more options) macros to and from the list mentioned above.
    - B) Configure Keys allows you to add and delete macros to and from you're F-keys. Simply click on one of >> buttons and a requester will pop up showing you all of the macros in the lwm directory. Choose one and that
-

macro will now be assigned to that particular F-key.  
Very useful for macros that you use a lot.

C) Direct Command allows you to execute a macro by clicking on the >> button and choosing a macro from the requester or possibly by entering a rexx command. The later I'm not sure about.

3) As far as the TPaint scripts, go into TPaint and hot key back to the WorkBench by hitting the left Amiga-M keys. Open a shell and type the following:

```
RX HD3:Toaster/Arxxx_Examples/TPaint/TPBars.rexx
  ^          ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^          ^
```

Drive/Partition - Complete path to the script - Script name

Read the scripts in a text viewer before executing. Usually the authors will have a description of the script and sometimes instructions in the header.

## 1.115 Avoiding Bugs When Metaforming

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### Avoiding Bugs When Metaforming

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QUESTION: If I triple an extruded font and later metaform the object, when I render why are there many strange errors on the face sides? I want to build rounded letters.

There appears to be a bug in Metaform which flips polygon surfaces under certain conditions. For example, when the polygons get real small, or when the surface face is slightly non-planar.

Try to avoid this problem by using un-tripled polygons only during Metaform. This seems to help. It means you have to use 4 point polygons only, but this is not difficult if you plan from the beginning for it.

Tripling polygons prior to Metaform also increases object "stiffness" and mutes the Metaform process, sometimes profoundly. Better results are obtained when using only 4 point polygons.

## 1.116 Metaforming A Phone Handset

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### Metaforming A Phone Handset

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James Hastings-Trew, 126 Willow Street, Saskatoon, SK Canada  
S7J 0C2 FidoNet 1:140/90

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The documentation that accompanies LightWave 3.5 does not go into too much detail regarding the function and use of the "Metaform" subdivide tool in LightWave's Modeler. I have created this step-by-step tutorial to illustrate the use of this important, but underdocumented feature of the software. By following this tutorial I hope that you will gain an understanding of the use of the metaform tool.

This tutorial assumes that you are very familiar with Modeler 3.5 and have experience with creating points, polygons, and modifying and manipulating objects.

The object that you'll create in following this tutorial is the handset from an old-fashioned telephone. These handsets were highly rounded, sculpted objects that would be difficult, if not impossible, to properly model with the standard lathe and extrude tools. The metaform subdivide allows us to construct a very crude approximation of the shape we want using simple-to-work shapes and tools, and then creates the smoothly changing contours based on the geometry of our original shape.

Step 1: To begin, create a rough outline of the general shape of one of the handset's ear/mouth pieces.  
(see~Figure~1)

Looking at Figure 1, you'll see that I've used the minimum possible geometry. There is a point placed only wherever the curve of the final object will change direction.

Step 2: Lathe this shape but use only 8 segments. This will be adequate for the metaform tool to turn into a completely rounded shape and allows us to work with very simple object geometry.  
(see~Figure~2)

Step 3: Rotate this shape 22.5 degrees which will straighten out the object so that we can easily add the handle.

Step 4: We need to make sure our geometry is as simple as possible. This means we must reduce the number of polygons as much as possible. Looking at Figure 3 you will see that the top and bottom of the shape consist of 8 triangles meeting at a point in the center. This is a result of the lathing operation in Step 2. Using the right mouse button, lasso the top polygons then cut and paste them into another layer. Press "k" on the keyboard to kill (Remove) these polygons, leaving only the points. Select and delete the middle point and then construct 3 polygons from the remaining points.  
(see~Figure~3)

You need to make sure that the polygons you create

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for metaforming contain no more than 4 vertices. This is optimal. Cut the polygons you have created, return to the original object, and paste them.

Step 5: Repeat Step 4, but perform the operation on the lower 8 center polygons. Lasso the polygons, cut them to another layer, kill the polygons, and delete the center point. Construct 3 new polygons and cut and paste them into the original object.

Step 6: We need to create a hole to which we can attach the handle of the handset. Metaform objects must consist of an external "skin" only -- there can be no "internal" polygons. Therefore, we cannot simply make a handle and let it overlap into the ear/mouthpiece of the handset -- it must be attached to it and be part of the surface. The best way to make a hole is to remove a polygon from our shape. However, if we were to remove an entire side, the handle attachment would be too large. Therefore, we are going to "slice" the object at a point to create a point at which we can cut the hole. Go to a new layer, and set your original layer to the background. Create a two point polygon that cuts through the object slightly below center.  
(see~Figure~4)

Return to the original layer, and select the layer with the two-point polygon as the background layer. Use Drill in the Tools panel to "Slice" the object on the Z axis. At this point, it would be a good idea to Merge Points on the object so far.

Step 7: Select the polygon on the top right-hand side and delete it.  
(see~Figure 5)

Step 8: Rotate the entire object -12 degrees.

Step 9: Move the entire object to the left.

Step 10: Mirror the object.

Step 11: Select the points around the "holes" that we created in Step 6.  
(see Figure 6)

Note that there are 8 points selected. Copy these points and paste them in a new layer.

Step 12: Create additional points to create the framework for a crude handle for our handset, which will join the ear and mouth piece.

Step 13: Create polygons between these points to create the handle.

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Remember that when picking points to create polygons they must be selected in clockwise order if the polygon's normal is to face you in the view you are working in, and counter-clockwise if it is to face away from you.

Step 14: Cut the handle and paste it into the original layer which contains the ear and mouth pieces.  
(see~Figure 7)

Merge the points. At this point, we have a good, but crude, approximation of our final shape. It is constructed entirely of 4 vertice polygons. It would be a good idea at this point to check the orientation of these polygons and flip any that are facing the wrong way. Once you begin metaforming this shape you will have too many polygons to deal with in trying to fix normal directions then!

Step 15: In the Polygon panel, select Metaform under Subdivide. You should end up with something that looks like.  
(see Figure 8)

Step 16: If your object is going to be far from the camera, you can skip this step. If your object is going to be seen in close up, then I suggest that you repeat the above Subdivide/Metaform operation again. This will improve the smoothness and make the it more realistic.

Step 17: Choose Polygon selection, go to the Display panel, and select Stats.

At the bottom of the Statistics display, you will see buttons marked "+" and "-" next to an item called "Non-Planar." The metaform function has a tendency to create non-planar polygons, which can cause rendering errors. Pressing the "+" button here will select all non-planar polygons in the object. Then you can go to the Polygon panel and choose Triple to divide these non-planar polygons into triangles.

Step 18: Apply surfaces and save your object.

I hope that this tutorial has helped you realize the potential of the metaform tool.

## 1.117 Metaforming Organic Forms

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Metaforming Organic Forms

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QUESTION: I have the old Motion Man object, but I also need

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to create other types of living creatures. I've been working with rail extrusions, multiple RE's, patches, lathing, etc., and can't achieve the nice flowing curved shapes of a living creature. What tool am I missing that can do the job?

SUGGESTION:

Use METAFORM, and make sure everything is made of 4 point polys on your first subdivision pass. Also, make sure your polygons are SINGLE SIDED, with points merged after operations like extrude, etc., and that there are no internal polygons left in the interior of the object(s) you create.

Metaform's smooth curves and easy interface make creating believable organic models comparatively easier (and better looking) than using tools like CSG Booleans.

TIP: "Constructing creatures with bi-lateral geometry"

Working on creatures in separate parts is a good time-saving idea. I like to start with the head first, which helps me get a feel for what the rest of the body should look like. It's always a good idea to save any changes in a separate file as you go. Once you have a head, you can use it over and over in different metaform projects. Working in scale is always a good idea and helps if you can find real-world measurements for your objects.

All you need now is one arm and one leg, created in the same 4 point manner. I like to trade off between doing these parts so that it saves me from going mad and lets me take a fresh look at the other parts when I go back to them. Make sure to save each revision as you go in case you need to go back if the software gets cranky and messes with your object. For example, if Merge Points merges TOO MANY points, then you may have accidentally ruined your object for Metaform. To check, copy the metaformed object and paste into an empty layer and give it one pass with Metaform. If it looks weird, you may need to start fresh (re-boot) and load up your last saved version. This is the safest way I've found around this problem.

TIP: Putting it together

Use mirror to make a copy for the appendages on each side of your meta-object and position them in the rough positions you want. The only object you need at this point would be a chest area, which everything is connected to. All it really is, is a box that has been subdivided by other boxes on its surface. Cut out the polys between where your arms, legs, and head will attach. There should be NO polygons between the attachment!

Make sure the point number between the objects match, so that you have a fully attached part. Use WELD or merge points to connect the parts. Some manipulation of your objects will be always be required, no matter how well you

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pre-plan. Save your work and then test render a single pass metaform or your new object to look for rendering errors. Parts that are not fully attached will have a sharp looking line around the joined area. This should help you hunt down the offending area, so you can fix it later.

TIP: Muscles and surface details

A humanoid chest has pecs and abdominal muscles. These can be easily created by using BEVEL (set data options to create four point polys first!) if its only one polygon, or EXTRUDE if its a group of polygons that you need to either push to pull from the meta\_object's surface. Make SURE to KILL ("k" key) all internal polygons when you entrude. Merge points after such operations, and before you start moving points around.

Test render to see if the angle of your bevel and the distance away from your "chest" made the proper curves you desired. Its hard to second guess just how metaform will create a smoothed object, but it does get easier with practice.

Remember to name your surfaces as you go. Metaform makes far too many polygons to be able to manipulate effeciently later on, should you choose to wait to surface your finished object.

Due to the curves that are created by metaform, the surfaces you define will be pulled and stretched in ways you may not prefer. You will have to use the new hide tools to help you clean up and perfect your surface names to fit the curves better since your original object was made from box-like shapes.

TIP: FINE TUNING YOUR META\_OBJECT WITH BONES

If you want a higher polygon count for animation with bones, set the data options for polygon creation to quadrangular. Select metaform, and your object will be smoothed without the strange "spiderwebbing" that metaform seems to do on its second subdivision pass. This cleans up the form for better kinematic motion without inducing weird rendering artifacts, which are especially noticeable with shadow mapped lights.

When you've reached the level of polygon density you desire, simply tripple your four point polys so that you have the needed triangles to animate properly with bones.

It's a good idea to test render the metaformed object, since the smoothing operation of Metaform can be hard to predict, and it might take some pushing and pulling of points (or reconstruction) to get the look you want. Remember to save as you go, and have fun!

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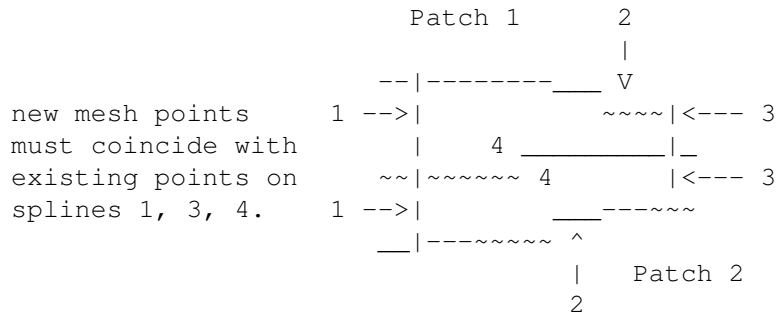


```

:           : bot XY splines   :           :
-----:-----:-----:-----:-----:-----
tail : rear half : front half : rear : front: head
:           :           : neck : neck: & beak

```

Now, select the 4 splines defining the contour of each major shape and click on Patch (Multiply), see below. Setup the requester. Click on UNDO if the results aren't satisfying, repeating until a smooth mesh is EVENLY spaced on the set of splines. Make note of the settings and enter them in for the next set of four splines. The KEY is to get all the new points created ON one set of splines to meet up "exactly" with the last patch so that a MERGE POINTS function can unify the polys where their edges meet on a spline.



When all sets of splines have been patched correctly (checking the polygon normals as you go), select only the splines (Display/Stats) cut and paste 'em to a new layer and save them if you haven't already.

Merge Points using Automatic first. Go back and Merge them again using Absolute, setting the value to an appropriate distance based on the size of the object. Use the Volume enclosure to limit the merges as smaller distances will be needed as the mesh converges on small sections (like the beak and tail in my example).

If the object is symmetrical on an axis (like my example of half a body side looking down on the XZ) then mirror the other half and merge points (Auto) again.

Wa La... Spline Patched object!

### 1.119 Overcoming Self-Crossing Bevels

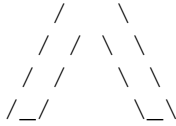
---

Overcoming Self-Crossing Bevels

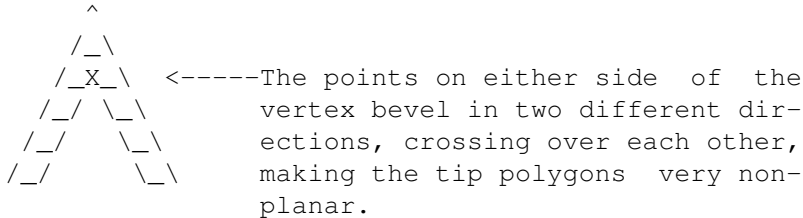
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QUESTION: I'm in the middle of a large flying-logo animation and having a problem modeling the main part of the logo. When Beveling acute angles like this:





... it looks like this:



Is there any way to fix this?

In descending order of difficulty:

- \* Edit the overlapping points of the bevel by hand. Or before beveling:
- \* Move some points to round off the sharp vertices.
- \* Move any points close to a vertex away from the vertex to allow more room for the bevel to clear itself.
- \* Delete any points close to a vertex.

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Your best best with complex shapes is to bevel outwards. This means setting the Shift and Inset to NEGATIVE numbers to generate a bevel AWAY from the selected poly rather than impinging on it.

You do have to mess around to get the right face polys back again, but it's not too terribly difficult. An outer bevel will have none of the same problems creating self-crossings. 4.0 Modeler has a new option to generate outer bevels since they are so useful.

## 1.120 Understanding Non-Planar Polygons

### ----- Understanding Non-Planar Polygons -----

QUESTION: What exactly are non-planar polygons? Why do they pop up when bending or stretching objects? The manual does not go into detail about non-planar poly's and why they are created exactly.

According to February 1994's issue of VTU, and some experimentation:

A non-planar polygon has 4 or more points that do not make a flat surface. If you have 3 points in a polygon, no matter

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where the points are you will have a flat surface unless it is degenerated by having more than one point occupying the same location.

Some good rules to follow as you build objects:

- 1) Merge points as you build and join each piece if you use booleans, cut, paste, mirror, etc.
- 2) Also always check with the stats menu as you build for non-planar and degenerate polygons, especially if you're using drag, twist, taper, stretch tools, etc.
- 3) Always triple the non-planar polygons. Unless you want to cut it or rebuild it.
- 4) Building a clean object means faster render times, less RAM usage, and less time figuring out the problem.

The tools mentioned here are merely examples to give you an idea of the type of operations that cause these non-planar polys. Hope this clears things up a bit for you!

## 1.121 What Are Detail Polygons?

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What Are Detail Polygons?  
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QUESTION: In the LW object file description Allen Hastings posted, there's a mention of Detail polygons. I've never heard of them before. The manual says nothing about them, either. Anyone know what they are and do?

Detail polygons are a hold over from Allen's earlier program Videoscape 3D.

Detail polygons are polygons which are 'attached' to other polygons such that they always render after the polygons they are attached to. This made sure that the Z buffer did not wipe these out during its distance calculations. They're useful for things like putting markings on things like the sides of an aircraft fuselage or on a road sign.

Detail polygons are a remnant of VideoScape, LightWave's predecessor. It's best to think of them as a workaround that hasn't been needed for a long time now. LW still loads objects that have them, though. An example is 3D:Objects/Computer/FloppyDisk (I think that's one of the objects that at some point came with LW).

## 1.122 What's The Maximum Points Per Polygon?

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### Polygon Maximum Points

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QUESTION: What is the limit to the number of points and polygons that an object can have? The manual does not make this clear.

You can have up to 65,535 ( $2^{16} - 1$ ) points and polygons in one object. At one time there was a limit of 200 vertices you could have in one polygon, but the manual now says, "There is no limit to the number of vertices a polygon may have. However, we recommend that single polygons be limited to no more than 16,000 vertices." I'd stick with 200 as a rule of thumb anyway.

## 1.123 Melting Font Logo Treatment

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### Melting Font Logo Treatment

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QUESTION: I would like to melt a gold surfaced logo and was going to take it into Modeler and attempt to dissect and deform it into another object (equal polygon count) and try to morph them. Any other suggestions?

Your idea is good, but a lot of work. You could achieve almost the same effect much more easily by simply using two objects, one of the logo -- the other of the melted pool. Have the logo drop slowly through the floor as the object of the melted pool grows larger under the logo (use the same surface with fractal reflections and move the texture down the logo and have the mottling expand outward as the pool grows). As ice melts it doesn't change its form much, other than shrinking (melting takes place primarily at the bottom where the puddle is growing). You could even shrink the logo slightly as it melts. Much easier than morphing into a melted version of the logo.

## 1.124 Advise On PAR Video Capture

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### Advise On PAR Video Capture

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QUESTION: Consider I only have S-VHS equipment, I have trouble getting my PAR to playback captured S-VHS video at a decent quality and I fear Betacam footage won't fare any better. What is the secret to getting the PAR to playback clean video?

There are two things you can do to make sure the video you record onto the PAR is the highest quality:

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- 1) Start with good quality source material, free from noise. Starting with BetaCam is a good way to go, since anything done to a professional level with that kind of equipment will be free of the noise and composite artifacts that makes the PAR work harder to compress the video.
- 2) Get the fastest hard drive you can afford for the PAR. A Micropolis 1.7 Gb should allow you to capture video at a high Q and Block limit setting.

There are other ways to do what you want. You could capture the video as "position only" or rough-work frames for use in positioning things in LightWave, and then render the scene out with a black or colored background that can then be luminance or chroma-keyed over the original video source. This would totally eliminate any recording problems with the PAR because you would not be using the PAR version of the video to produce the final job. To do this, you would not only need to rent two BetaCam decks, you'd also need some type of chroma-key equipment to combine the PAR animation with the original source video. However, you'd get the best possible final quality that way.

## 1.125 Understanding PAR Q And Block Settings

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### Understanding PAR Q And Block Settings

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QUESTION: Does anybody know what level of video quality you can record to the PAR with a TBCIV? I only have S-VHS and have trouble getting super clean video out of the PAR. If I raise the Q level and Block setting to the point where a single frame looks great, when I try to capture a stream of video, I get the "Block Setting Exceeded" message.

Here's the problem, when you are recording an animation from Lightwave to the PAR, the PAR software has the time to try to maximize the Q-Level setting to fit your block size on a frame by frame basis. When you are trying to digitize video, the PAR has only 1/30th of a second to digitize and store each frame. Therefore, it can only try one quality setting, and that one quality setting has to fit the entire recording for good and bad frames alike.

Super clean video (ie. very little signal noise) will allow you to set a very high quality setting when digitizing. Dirty (noisy) video will force you to use a very low quality setting. The reason? The hardware does not have the ability to discriminate between noise and detail. The compression algorithm used (JPEG) is set up to maximize detail retention and loose the most on large flat areas of slowly changing colour. Lots of noise in the signal makes JPEG "think" there is lots of detail. Your compression goes into the toilet and the number of blocks it takes to store each frame

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on the PAR hard drive exceeds the block limit that you set. Clean video compresses very well, so you can set a higher quality level and still meet the block limit for storing the frames.

There are a couple of ways to help the PAR with marginal video. One way is to "compress" the dynamic range of the video by playing with the TBC IV's proc-amp settings. By raising the black pedestal and lowering the brightness you're compressing the contrast range (dynamic range) of the video signal. This has the effect of minimizing noise and detail, and makes the signal slightly easier to compress. You can regain the full dynamic range by processing the frames through ADPro or Imagemaster to regain image contrast before you use the frames as a series of backdrop images in a LW rendering. This will cause a slight banding in the image (depending on how severely you killed the contrast to begin with) but this is less objectionable than the JPEG artifacts you'd get by lowering the PAR's Q-factor to record the same signal at full dynamic range.

Another way to help the PAR out is by filtering (softening) the video before it gets to the TBC IV and the PAR with an external video processing box. You'll lose image sharpness, but again, this is less objectionable than JPEG artifacts.

The best way is to just have super clean video to begin with. A good camera, good tape, and betacam equipment should do the trick here.

## 1.126 Making Explosion Image Sequences

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### Making Explosion Image Sequences

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Here's a poor mans way to make "digitized" explosions.

Paint about 5 frames of an explosion in Brilliance. DPaint, Toaster Paint, Alpha Paint, or Black & Decker Paint works well, too.

These 5 images are just just "key frames" to make a 90 frame explosion created using Morph Plus to make 'tweens'. True, it's not the BEST solution but it is A solution.

Painting 3 frames of burning fire and morphing them into a 60 frame loop is another application of this technique.

## 1.127 Making Real Explosions For LW Mapping

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### Making Real Explosions For LW Mapping

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Here are some ways to make miniture explosions for highspeed filming that can be used as image sequences for LW effects.

Try a baloon with some Acytelene inside it (NOT TOO MUCH) get a long fire cracker wick and some string to secure it (acytelene floats). This is actually an implosion/concusion type detonation which is what a large spaceship would do. If you don't happen to have a ready supply of Acytelene, Calcium Carbide in water produces Acytelene gas. It's available from many camping gear stores for use in lamps.

Use the magnesium innards of a flashbulb and hang it from a black ceiling and ignite it electrically while filming in very high speed from below. This technique, very similar to the explosion technique in Star Wars, works very well and doesn't require a pyro license (to my knowledge).

One part Potassium Chlorate (KClO3) to 3 or 4 parts 4x powdered sugar make a violet/purple fast burning flame with LOTS of white smoke.

Pure Benzoyl Peroxide (the stuff in Clearasil) burns like a miniture petroleum fueled explosion or oil fire with LOTS of black sooty smoke and yellow orange rolling flames.

DISCLAIMER:

Professional explosion effects are an exact science. Don't do this at home, whether you are an adult or not. Call a pyrotechnic engineer, they're in the yellow pages. Anyone doing pyro effects for stage shows can setup something PRE-DICTABLE. These guys have all kinds of great tools. One candidate is the flash pot driven by condensed air. They have special containers, look like big hydraulic pumps. The powder is electrically ignited on the top, the next instant the cylinder shoots air up into the flame creating a rolling fireball.

## 1.128 Pixel vs Object Aspect Ratios

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Pixel vs Object Aspect Ratios  
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QUESTION: After reading the thread on the whole aspect ratio debate and modeling a flat plane to fit the camera/video aspect ratio, I've got one question: How did the 1.346:1 aspect ratio get calculated? What's it based on in the "real world?"

It comes from the real-world width-to-height ratio of a single framestore or Toaster RGB IFF pixel.

When using a VIDEO image in LightWave, this aspect ratio has to be accounted for to maintain the proper aspect ratio of the frame of video. If you were to model a panel that is

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exactly 752mm x 480mm (RGB pixel dimensions) and automatic size an image having 752 x 480 pixels onto that panel, the panel would cause the image to be distorted horizontally when rendered since the panel does not fill the dimensions of the screen due to it's construction using square units and not units corresponding to the shape of the image's pixels. One non-square pixel would be rendered in the shape of a square millimeter. That right there is your problem, the metric dimensions in LightWave are perfectly square, but the image being mapped isn't.

The extra work of creating objects with the 1.346:1 ratio in mind is ONLY necessary when mapping captured video/still images onto them.

For example:

In modeler, make a box with the following settings in meters

|   | Low    | High  | Segments |
|---|--------|-------|----------|
| X | -1.346 | 1.346 | 1        |
| Y | -1.0   | 1.0   | 1        |
| Z | 0.0 *  | 0.0   | 1        |

\* If you want depth for this box and to make that depth the same as the width, enter the same values as for X

Surface this box as "Screen" (or your choice), and save it.

To position it (using the flat box example, with no depth), set the object's Z position in Layout as 3.2 - the same as the camera's Zoom factor. Make a keyframe, and you're set.

Now, if you had made the box with the same depth as it has width, you would have to position it at 3.2 meters plus half of the depth of 1.346 meters, or  $3.2 + .673 = 3.873$ , to get the front face of the box to exactly fill the screen.

In this way, you can make a 3D transition from one source to another by starting the animated 3D transistion effect on the same frame that you cut to the animation from source 1 and ending the transition on the same frame that you cut to source 2.

## 1.129 Arexx Script To Render Multiple Scenes

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Arexx Script To Render Multiple Scenes

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Here is a program I wrote to allow batch rendering of LightWave scenes.

```
/* This program batch renders user specified LightWave*/
/* scene files. By Dan Bloomfield */
```

---

```

address 'LightWaveARexx.port'
say 'How many scenes do you want to batch render? '
pull SceneNumber
do Loop=1 to SceneNumber
say 'What is the name of Scene number 'Loop''
pull SceneName.Loop
end
say 'Specify directory path for saved frames '
pull DirPath
say 'Now Batch Rendering'
do Loop=1 to SceneNumber
'LoadScene Scenes/'SceneName.Loop
'SaveImages 'DirPath'/'SceneName.Loop
'Render 1'
end
say 'Batch Render done. Rendered 'SceneNumber 'files.'
exit

```

Save the above script as "BatchRender"

To launch this program from a shell just make sure ARexx is active and type:

```
rx BatchRender
```

To render Framestores instead of RGB files just substitute the 'SaveFrames' command for the 'SaveImages' command.

## 1.130 LockedChannels Usage For Modeler Arexx

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LockedChannels Usage For Modeler Arexx

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QUESTION: Could a programmer describe how 'LockedChannels' is implemented? What are the codes for XYZ, HPB, ScaleXYZ?

The "channels" in LockedChannels refers to the XYZ and HPB buttons in the Mouse section of the Layout interface. The <int> following LockedChannels contains bit fields for each of these. From within ARexx, the value of the bit fields can be tested by the BITAND() function like this:

```

a = readln( file )
if word( a, 1 ) = "LockedChannels" then do
  channels = d2c( word( a, 2 ) )
  if bitand( channels, n ) ~= 0 then
    /* channel n is locked */

```

The table of values for <n> is:

```

'0001'x Move X
'0002'x Move Y
'0004'x Move Z
'0008'x Rotate H
'0010'x Rotate P

```

---

```
'0020'x Rotate B
'0040'x Size/Stretch X
'0080'x Size/Stretch Y
'0100'x Size/Stretch Z
'0200'x Move Pivot Pt X
'0400'x Move Pivot Pt Y
'0800'x Move Pivot Pt Z
```

(The notation '0001'x is the ARexx way to write the packed binary image of a number using hex digits. ARexx ordinarily stores numbers, like everything else, as text strings.)

## 1.131 Setting Up GigaMem For LW

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### Setting Up GigaMem For LW

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(Gigamem must be properly customized for Lightwave so that you don't get those "not enough memory," "no memory for Z or RGB buffers," etc. messages)

If Gigamem doesn't work on your system, you don't have a functioning MMU. If it does, then you will need to customize it for Lightwave and Modeler as follows: Go into Advanced Settings for both of these two applications and make sure the settings are:

```
buffer      4.0 <-- this varies depending on your real memory
cache       300 <-- this varies depending on your real memory
attribute   0   <-- this is the default
mask        1   <-- this is the default
minsize     10 <-- this setting is the critical one!!!
```

Your buffer and cache settings may vary due to the exact amount of real memory on your specific machine (they affect performance) but the other settings of attribute, mask and minsize MUST be set as above for both Modeler and Lightwave.

P.S. There is another virtual memory manager on AMINET for anyone who does not have GIGAMEM called VMM and it now works with an '030. Some have reported that it works much better than GigaMem, too.

## 1.132 VT4000 Software On An A2000?

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### VT4000 Software On An A2000?

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QUESTION: Can the Toaster 4000 (3.0) system be loaded onto an old A2000 with the 2.0 card?

No! The VT4000 software for the 4000 card ONLY works on a

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A4000 system with the VT4000 card. NewTek DOES have the newer 3.x version of the Toaster software for the A2000 with the 2.0 card. Should be quite reasonable to get the upgrade, now that 4.0 is shipping!

### 1.133 Self-Crossing Bevels Conclusion

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#### Self-Crossing Bevels Conclusion

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In a couple of previous posts by JG and SF, they suggested bevelling OUT to avoid the problem on sharp convex portions of an object's outline. This works (I'm somewhat reluctant to debate the point with these guys) however, if the object also has sharp concave areas, it will cause the same sort of crossed up polygons in those areas.

Ah, but there's a big difference - the crossed polygons that occur in concave areas when beveling outward are hidden inside the object. Unless the letters are transparent, the object will look perfect when rendered. I agree with JG and SF that outside beveling is the way to go, with thick fonts as well as thin.

I would also like to follow up on the beveled font smoothing angle issue. Beveled fonts are a great example of why I put in an adjustable smoothing angle in the first place. There's no need to bother with separate surface names for faces vs. bevels (although that's not a bad idea for other reasons), or point-doubling along the borders of the faces, just to prevent smoothing from the faces to the bevels. Instead, just set the max. smoothing angle to 40 degrees or so. Some people complained that such an angle might prevent smoothing on the curving sides of letters, but you'd have to be using a really crude font for that to happen. In most fonts, the angle between the segments making up a curve will be more like 15 degrees or less. In situations where more extreme angles are found (such as the indent on the right side of a capital "B"), you really want a sharp crease in the shading, so lowering the smoothing angle will help there too.

-AH

### 1.134 How Does Adaptive Sampling Work?

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#### How Does Adaptive Sampling Work?

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LW does appear to use all three colors in the edge detection during adaptive sampling, but the red must vary by twice the threshold, and the blue by four times the threshold. If any of the three colors exceeds its limit, the pixel is anti-aliased.

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This was figured out experimentally by rendering a scene with nothing in it but a diagonal polygon with a color gradient on it (and a reticule) against a black background, one each for red, green, blue, and yellow. Note was taken of where the AA stopped and checked the color value of the gradient at that point. The numbers came out almost exactly to threshold for green, 2x for red, and 4x for blue.

### 1.135 Solid Drill vs. Boolean Subtract

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Solid Drill vs. Boolean Subtract

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QUESTION: What are the main differences between Solid Drill Tunnel and Boolean-Subtract? From what I read, it seems that only the surface names affected are different.

Solid Drill only creates a hole in existing polygons, no NEW polygons are created. Boolean Subtract creates new interior polygons. It is like the difference between cutting into a hollow object (drill) and a solid object (subtract).

### 1.136 Dual Surfaces Using Object Morphs

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Mixed Dual Surfaces Using Object Morphs

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QUESTION: How do I add multiple textures to a surface in LightWave when they have to be created using the same surface channel like Color or Diffusion?

One way to combine two (and only two) textures is to set up a morph from an object to a copy of the same object with different surface names using Surface Morphing turned ON and the Morph Envelope set to 50%.

### 1.137 Basics On Using The Patch Function

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Basics On Using The Patch Function

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QUESTION: I'm having problems getting the PATCH command in Modeler to work. Anyone have any quick tips that might point me in the right direction?

You must have a completely enclosed area bounded by three or four connected spline curves. To connect spline curves, either start a curve from a point on a pre-existing curve or select a point on each curve and use Merge or Weld.

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Curves are connected if they share a point, but it doesn't have to be the start or end point. If you use the sketch command to create curves, they'll sometimes look like they share points, but if you zoom in far enough you'll find that they don't. Make sure the curves completely enclose an area and directly select the curves before using patch. The requestor that pops up allows you to specify the number of polys generated (ie. a 10 x 10 grid would have 100 polys). Patches defined by 4 curves will generally render smoother than those defined by only three.

### 1.138 Simple Patch Help

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#### Simple Patch Help

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The easiest way to learn how patching works is by creating 4 points in one window as if they were the four corners of a square. After creating all 4 points, deselect all of them. Next, starting in the upper left corner and working clockwise, select 2 points and hit Control-P (or the Make Curve button). After you make the first two into a Curve, make sure they're deselected and select the upper right point and the lower right and repeat. Do this until you have four curves which all will share end points.

Once you have your four curves, practice selecting them and using the PATCH button (Control-F) to patch them. Try undoing and changing the parameters and repatching.

### 1.139 Mores Basics On Using Patch

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#### More Basics On Using Patch

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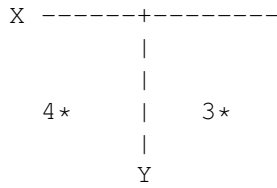
Patches work with spline curves. Look at it this way, a spline is actually a piece of bent metal that boat makers used to use to tie wet pieces of wood to, leaving them tied like that for a few days. The tension of the ropes pulling on the wood towards the curved metal (Spline) would eventually make the wood take the shape of the spline.

So, in Modeler from left to right make four points (X axis). With them highlighted, go to the Tools menu and select Make under the Curves section. This will make the Spline Curve out of these points.

```

      |
1*   |   2*
      |
      |

```

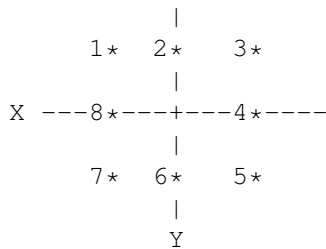


(Front View)

Now, if you select Polygon from the bottom of the screen you should see the spline curve highlighted. Deselect all points and go back to the Tool menu. Select points 1 & 2 and click Make (Curve). Select points 2 & 3 and click Make. Select points 3 & 4 and click Make. Select points 4 & 1 and click Make. Now you have an enclosed square of spline curves. Even though they look straight they are considered spline curves.

If you now select Polygon from the bottom menu, you should see the splines highlighted. With all highlighted, select Patch from the multiply menu. A requestor will pop up. Just click OK. You should see those splines turned into a wireframe mesh.

It's time to experiment. Do the exact same thing as above only add a middle point to each set of points like below.



Deselect all points and go to the Tools menu. Select the points like before only in threes. Select points 1, 2, & 3 then click Make, etc.

With Points on the bottom menu still selected, use the Drag tool in the Modify menu and drag the middle points back into the Z axis. Now choose Polygon from the bottom menu and make sure that all of the splines are highlighted. Go to the Multiply menu and Patch these just as before. You should've gotten a wavy wireframe mesh this time. What's happening is that the splines are forcing the mesh (defined by the Patch requester) to take the shape of the curves!

Try using half circles next time, or use the sketch tool to draw the splines and then patch them! The thing to remember is that the splines have to ENCLOSE a volume of space, ie. be connected end-to-end, for this to work. You can only patch only 4 splines at one time.