

## **IML-FAQ#11**

Ernesto Poveda Cortes

<b>COLLABORATORS</b>
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	<i>TITLE :</i> IML-FAQ#11	
<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>
WRITTEN BY	Ernesto Poveda Cortes	April 17, 2022
<i>SIGNATURE</i>		

<b>REVISION HISTORY</b>
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NUMBER	DATE	DESCRIPTION	NAME

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# Chapter 1

## IML-FAQ#11

### 1.1 Imagine Mailing List FAQ #11 - AmigaGuide format v1.2

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+=====+
| Imagine Mailing List |
| FREQUENTLY ASKED QUESTIONS |
|-----|
| Compiled By |
| Gabriele Scibilia |
| Michael B. Comet |
| Steve Mund |
| Mark Oldfield |
| Dave Wickard |
+=====+
```

#### What's New

#### Contents

This is the Frequently Asked Questions posting for the Imagine Mailing list. This posting is sent every so often to answer general questions that users of the 3D rendering software, Imagine by Impulse Inc. may have. It is aimed toward all users, especially newcomers to the program.

If you find any errors or have answers to other frequently asked questions that you would like to have included in this posting, please send e-mail to: [imlfaq@email.eag.unisys.gsg.com](mailto:imlfaq@email.eag.unisys.gsg.com) (FAQ List).

- Gabriele S.

But, Who made this nice hypertext version?

### 1.2 What's New

Last Update : April 8, 1996 Monday

Issue Number : 11

What's New : [Section 1, No 1](#). Updated HTML home pages list,  
updated BBSes list, updated



magazines list, general re-editing,  
updated FTP site informations

[Section 1, No 3. What was IML?](#)

[Section 1, No 4. What's the new Imagine Mailing List?](#)

[Section 2, No 42. Springs, spirals and coils](#)

[Section 2, No 43. Modeling tips](#)

[Section 2, No 44. Starting project](#)

[Section 2, No 45. Phong shading](#)

[Section 2, No 46. Lights](#)

[Section 2, No 47. Lights](#)

[Section 8, No 33. Asteroids](#)

[Section 8, No 34. Alien](#)

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## 1.3 Contents

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SECTION 1 - Support Products/Sites

1] [Imagine related:](#)

References/Help Books/Magazines/ftp sites,BBSes,  
Models/Textures (pics) materials, HTML home pages.

2] [How do I reach Impulse?](#)

3] [What was the Imagine Mailing List?](#)

4] [What is the Imagine Mailing List and how to get it?](#)

SECTION 2 - Modeling and Detail Editor

1] [How do I brush-map a ground plane?](#)

2] [How do I make glass?](#)

3] [The Slice command doesn't work or gives me errors.](#)

4] [How can I make a room so that the walls don't have cracks?](#)

5] [When I select a group of points in the DETAIL editor, all I can do is drag them...not ROTATE or SCALE interactively.](#)

6] [List of common Index of Refractions](#)

7] [How do you make mirrors?](#)

8] [How do I make 'metals' and what are some good gold attributes?](#)

9] [Is there a quick way to add faces to my object without using the Slice command?](#)

- 10] [How do I make 'wire-frame' objects?](#)
  - 11] [How can I create seashells?](#)
  - 12] [May I use more than four textures in Imagine v2.0?](#)
  - 13] [How do I make realistic clouds?](#)
  - 14] [How do I create visible light beams?](#)
  - 15] [How can I simulate underwater ambient?](#)
  - 16] [Does anyone have suggestions for emulating soft shadows?](#)
  - 17] [Can I create 2d/3d smoke effects? How?](#)
  - 18] [How Bones works?](#) (by Lesk and Mark Decker)
  - 19] [Halo around light sources: the glow effect.](#)
  - 20] [Can a reflective object inside a glass tube render properly?](#)
  - 21] [Help with Slice function](#) , By J. Goldman.
  - 22] [Fog object and global fog](#) : undersea fog spotlight.
  - 23] [Disco ball effect](#) : how simulate some sort of radiosity.
  - 24] [How can I create a candle flame?](#)
  - 25] [What are the differences between Spin and Sweep functions?](#)
  - 26] [Modeling strategies](#) : modeling hands, feet, etc...
  - 27] [How can I create neon lights?](#)
  - 28] [How can I get a checkered plane](#) with checks of different textures?
  - 29] [How can I simulate the effect of a bright light reflecting off thousands of tiny particles](#) suspended in air?
  - 30] [I still have questions about the bones feature](#) , let's say I had a "can" object of coke and I want to make it dance.
  - 31] [Constrain, freeze, release: inverse kinematics.](#)
  - 32] [Inverse kinematics: getting started](#) , By Randy R. Wall.
  - 33] [Phong edges](#) , By Charles Blaquiere.
  - 34] [How do I obtain a nice sparkle off the edge of a wine glass or chrome object](#) (By George deBeaumont)?
  - 35] [Imagine something hairy....](#)
  - 36] [Brick quickly](#) , By Conny Joennson.
  - 37] [Realistic glass](#) , By Lumbient.
  - 38] [Extruding 3D objects](#) , By Steven Blackmon.
  - 39] [Negative scaling: mirror feature](#) , By Gregory Denby.
  - 40] [How Smoothing tool works](#) (By Bill Dimech)?
  - 41] [Receiver, a Smoothing tool example](#) , By Gabriele Scibilia
  - 42] [Creating springs, spirals and coils](#) , By Stephen Gifford.
  - 43] [Modelling tips](#) , By Tom Granberg.
  - 44] [A first Imagine project](#) , By Gregory Denby.
-

45] [Phong shading: side effects](#) , By Gregory Denby.

46] [Lighting oddities](#) , By Gregory Denby.

47] [Lighting strategies for Imagine](#) , By Gregory Denby.

#### SECTION 3 - Forms Editor

1] After a Forms Editor object is loaded into the Detail Editor and manipulated, [it won't reload into the Forms Editor](#).

2] Forms Editor: [getting started](#) , By David Alan Steiger.

#### SECTION 4 - Cycle Editor

1] I made this [animation sequence in the Cycle editor](#) , but when I set it up in the stage/action editors, the motion of the overall object isn't there!

#### SECTION 5 - Spline Editor

1] I tried to import a Postscript font but I got a ['Vector not found'](#) error. What does this mean?

#### SECTION 6 - Animation, Stage Editor and Action Editor

1] Even though I move an Object/Camera/Light to a new [POSITION/ALIGNMENT/SIZE in the STAGE editor](#) , Imagine seems to 'forget' what I did!

2] [How do I use the Grow Effect?](#)

3] [How do I use the Tumble Effect?](#)

4] How do you get something to [roll \(at the right speed!\)](#) while following a path?

5] When I move a [Tracked Camera in the STAGE editor](#) , it doesn't realign and draw the Perspective view correctly!

6] When I increase the number of frames in an animation I find my [scene gets mangled in the first frame](#) . Why?

7] [How do I use the Sway Effect?](#)

8] [Depth of field](#).

9] [I'm having trouble creating a revolving light](#) (ala emergency vehicle), I am making an animation of a room which has hanger-type doors opening and I want to make a warning light which flashes when the doors open, By Peter Borchers.

10] [Inertia effect: overshoot](#) , By Charles Blaquiere and Milan Polle.

#### SECTION 7 - Rendering and the Project Editor

1] [Why do objects render fine in Scan-line, but disappear in Trace?](#)

2] I have a problem with [Filtered objects/fog and the Global Backdrop!](#)

3] My animation frames look fine, but when animated, they have [the 'crawly' effect](#).

4] What situations, parameters, attribute values, etc. require

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the most **trace rendering time**?

5] **How do I get rid of the 'Jaggies'?**

6] **How can I figure out pixel aspect for a given resolution?**

7] When making a **disco ball effect**, will a SPHERICAL light set at 255 be bright enough to cause visible spots on the surfaces in a scene?

8] **How long should it take to do a full trace picture** with perhaps one transparent glass on a Amiga 3000/25? Is 4.5 hrs too much?

9] **Is there any particular format that Imagine prefers?**

Ham? 32 Color? EHB? 24 bit 1000 x 1000?

10] I would like to use **conical light sources** with my rendering, is there anyway "see" in wire-frame where the light will fall?

11] **How important is lighting for a rendering**, and is there any 'preset' method used to get good results?

12] **Help with Fog**, How do I use it and how does it work?

13] **How can I render in Wide-screen/Letter-box format?**

14] I selected Spheres for my **particle object**, but all I get is a polygonal shape!

15] **Help with Fog**: if you place a fog object inside another, they cancel out, why?

16] The config file says something about '**oct-tree level**'. What EXACTLY is this about?

## SECTION 8 - Essence Settings and Other Attributes

1] **Electrical Arc** (Essence)

2] **Veined Marble** (Essence)

3] **Rough marble/rock** (Essence)

4] **Soap Bubble** (Imagine 2.0 and higher)

5] **Spaceship Panels** (Imagine 2.9 and higher)

6] **Bark, mountain, stone effects** (Imagine 2.9 and higher)

7] **Solar corona** (Essence)

8] **Solar corona** (Imagine 2.9 and higher)

9] **Sludge** (Imagine 2.9 and higher)

10] **Marble** (Imagine 2.0 and higher)

11] **Starfield** (Imagine 2.9 and higher)

12] **Photon Torpedo** (Imagine 2.9 and higher)

13] **Spaceship shield** (Imagine 2.9 and higher)

14] **Spaceship shield** (Imagine 2.9 and higher)

15] **All purpose ground cover** (Imagine 2.9 and higher)

- 16] [Steam engine, shafts of light](#) (Imagine 2.9 and higher)
- 17] [Fun with Fuzz texture](#) (Imagine 2.9 and higher)
- 18] [Water](#) (Imagine 2.0 and higher)
- 19] [Castle brick](#) (Essence)
- 20] [Cloth](#) (Essence)
- 21] [Fabric](#) (Imagine v2.9 and higher)
- 22] [Glowing fireball](#) (Imagine 2.9 and higher)
- 23] [Nebulae](#) (Imagine 2.9 and higher)
- 24] [Fire and ice](#) (Imagine 2.9 and higher)
- 25] [Quick & dirty way to make trees](#) (Imagine 2.9 and higher)
- 26] [Ship texture](#) (Imagine 2.9 and higher)
- 27] [Carpet](#) (Imagine 2.9 and higher)
- 28] [Plasma beam](#) (Imagine 2.9 and higher)
- 29] [Nebulae](#) (Imagine 2.9 and higher)
- 30] [Lightning](#) (Imagine 2.9 and higher)
- 31] [Fire](#) (Essence)
- 32] [Clouds](#) (Essence)
- 33] [Asteroids](#) (Imagine 2.9 and higher)
- 34] [Alien surfaces](#) (Imagine 2.9 and higher)

#### SECTION 9 - Miscellaneous

- 1] What the heck is BTW, IMO and other weird [abbreviations](#) ...
- 2] [Rendering and refresh times](#) are MUCH too slow, even with an accelerator. Are there any Basic tricks or hints to help?
- 3] [How long will before my renderings aren't ugly anymore?](#)
- 4] [Hex edit for Imagine](#) - High Res video mode change Amiga only
- 5] [What are Particles?](#)
- 6] [Everything about motion blur](#) , By Mark Allan Fox
- 7] [3D stereograms](#) , By Gary Beeton
- 8] [Working with bitmaps](#) , By Douglas Smith
- 9] [What are N.U.R.B.S?](#)
- 10] [What's a Blob?](#)

#### CLOSING - Closing statements and Disclaimer

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## 1.4 SECTION 1 - Support Products/Sites

1] Imagine related: References/Help Books/Magazines/ftp sites, BBSes, Models/Textures (pics) materials, HTML home pages.

-> [REFERENCES AND HELP BOOKS](#)

-> [MAGAZINES](#)

-> [FTP SITES](#)

-> [MODELS/TEXTURES LIBRARY](#)

-> [BULLETIN BOARD SYSTEMS](#)

-> [HTML PAGES](#)

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## 1.5 REFERENCES AND HELP BOOKS

"Imagine 2.0 User Manual", Impulse Inc, 1992.

(Yes....read the manual!)

"The Imagine Companion", David Duberman, Motion Blur Publishing,  
1991.

"Understanding Imagine 2.0", Steven Worley, Apex Software  
Publishing, 1992.

"3D Modeling Lab", Philip Shaddock, The Waite Group Press,  
ISBN 1-878739-52-2, 1994.

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## 1.6 MAGAZINES

These are some good graphics magazines, most of which focus on the Amiga computer. If anyone has some other suggestions please post them to the FAQ list!

"Amazing Computing for the Commodore Amiga" aka "Amazing Amiga"

P.O. Box 2140

Fall River, MA 02722-9969 USA

(508) 678 - 4200

(800) 345 - 3360

(508) 675 - 6002 (FAX)

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(A general Amiga computer magazine, focusing more on how to, hints and tips, programming, reviews of software and hardware (less ads and more meat than AW))

"Amiga Video/Graphics Magazine" (formerly AVID)

365 Victor Street

Suite "H"

Salinas, CA 93907

(408) 758 - 9386

(408) 758 - 1744 (FAX)

(A general Amiga computer magazine, focusing on both hardware, software, utilities and graphics)

"Amiga World"

P.O. Box 595

Mt Morris, IL 61054-7900

(800) 827 - 0877

(815) 734 - 1109

(A general Amiga computer magazine, focusing on both hardware, software, utilities and graphics)

"AV Video"

701 Westchester Ave

White Plains, NY 10604

(800) 800 - 5474

(914) 328 - 9157

(914) 328 - 9093 (FAX)

(An audio/video and computer magazine. Has articles about all types of video and graphics applications including the Amiga and Video Toaster)

"Computer Artists"

P.O. Box 2649

Tulsa, OK 74101-9632

(A magazine specifically for computer artists. Articles on software and methods from Amigas, PC's and MAC's)

"Computer Graphics World"

P.O. Box 122

Tulsa, OK 74101-9845

(800) 443 - 6632

(918) 835 - 3161 ext. 400

(918) 831 - 9497 (FAX)

(A general computer graphics magazine focusing on the latest technology from PC's to SGI's)

"Video Toaster User"

21611 Stevens Creek Blvd. AVID Publications,

Cupertino, CA 95014 273 N. Mathilda, Sunnyvale,

(800) 322 - 2834 CA 94086, USA

(A magazine focusing specifically on NewTek's Video Toaster device. Nothing related to Imagine, but some more neat pictures to look at!)

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"Computer Gazette"

IHT Gruppo Editoriale S.r.l.

Via Monte Napoleone, 9 - 20121 Milano

(39) 02 - 895921

<http://www.iht.it/>

"Scientific Amigan"

Dept AZ, POB 60685,

Savannah, GA 31420-0685, USA

"Geoffrey William's Computer Artists & Videographer Report" aka "The CAV Report"

CBP, 1833 Verdugo Vista Drive,

Glendale, CA 90218

USA (818) 2409845

USA (818) 2409845 (FAX)

"XPress" aka "The Amiga CAD Newsletter"

8231 NE Paulanna Lane,

Bainbridge Island, WA 98110, USA

"Nonlinear Nonsense"

Cedar Software, PO Box 4495,

Wolcott, VT 05680

USA (802) 8885275

USA (802) 8883009 (FAX)

"3D Artist"

Columbine Inc. PO Box 4787,

Santa Fe, NM 87502-4787

USA (505) 9823532

USA (505) 8206929 (FAX)

(Magazine for users of 3D Studio, Lightwave 3D, Topas and other popular programs including low -cost pro gr ams. Topics includes modeling, lighting, camera work, character an imation , so und, and video)

"Amigator"

PO Box 26026, Nepean,

Ontario, Canada K2H 9R0

"Computer Grafica, Tecniche & Applicazioni"

Imago Edizioni

Via Trilussa, 40 - 00011 Bagni di Tivoli (Roma)

ITA (39) 0774 - 355886

"Computer Arts, The magazine of art, design and technology"

Future Publishing

30 Monmouth Street, Bath, Avon, BA1 2BW

UK 01225 442244

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mailto:computergrafica.img@agora.stm.it

"3D Design"

USA 1 - 800 - 829 - 250

"Computer Arts, The magazine of art, design and technology"

Future Publishing

30 Monmouth Street, Bath, Avon, BA1 2BW

UK 01225 442244

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## 1.7 FTP SITES:

There is now a new ftp site set up for Imagine related items including pictures, animations, tu tori als, objects, and help files such as previous postings from the list, and this FAQ.

There is a complete archive of the IML (well maintained by our friend Nikola Vukovljak <nvukovlj@ucc .su.OZ.A U>). C ur rently, our official IML archival site (The IML Landfill) is at ftp.wu stl.edu or wuarc hive.wustl.edu (128.252.135.4) in the path:

/systems/amiga/aminet/gfx/3d

The complete archives of the IML discussions are available for anonymous FTP in the archive directory as is the IML-FAQ (frequently asked questions).

In addition, there are always new Imagine-related objects, scenes, animation s and p rojects popping up. If You have a source for Imagine objects, renderings, gifs, etc. the IML is a perfect place to share this kind of information and the IML Landfill site is a swell place to put 'em where we can all check them out!

Note: New files cannot be sent directly here. Instead send any new files You wish to upload into the same directory:

/systems/amiga/aminet/new

Files here will/should eventually get moved to the proper location by the FTP site administrator. Don't forget to send a text file explaining the data You uploaded, and where it should be placed.

Aminet can be reached on the same FTP site (ftp.wustl.edu) under /systems/amiga/aminet. Num erous other sites also have the aminet directories.

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## 1.8 Models/Textures Library

Imagination Works

644 N. Santa Cruz avenue,

Suite 12, Los Gatos, CA 95030

USA (408) 3545067

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**Antigravity Products**

456 Lincoln Blvd.,  
Santa Monica, CA 90402  
USA (310) 3936650  
USA (310) 5766383 (FAX)

**Visual Inspirations**

809 West Hollywood,  
Tampa, FL 33604  
USA (813) 9356410  
USA (813) 9356513 (BBS)

**View Point Data Labs**

625 S. State street,  
Orem, UT 84058  
USA (801) 2293000  
USA (801) 2293000 (FAX)

**Micro R&D**

P.O. Box 130,  
721 "O" Street,  
Loup City, NE 68853  
USA (308) 7451246

**Syndesis Corporation**

235 South Main Street,  
Jefferson, WI 53549  
USA (414) 6745200  
USA (414) 6746363 (FAX)

[syndesis@beta.inc.net](mailto:syndesis@beta.inc.net)

**Modern Medium**

580 West 8th. avenue Eugene,  
OR 97401  
USA (503) 3434281  
USA (503) 3434325

**AniGraF/X**

PO Box 1715,  
Jacksonville, OR 97530  
USA (503) 7726525  
USA (503) 8570616

**VRS Media**

7116 SW 47 Street,  
Miami, FL 33155

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USA (305) 6675005

Richard & Esther Shapiro Entertainment Inc.

335, North Maple Drive,

Beverly Hills, California 90210

USA (512) 3281454

USA (512) 3281455

Cybergraf Synthiotics

PO Box 5851, Hanover Center,

Wilmington, NC 28403-0879

USA (910) 7625776

Digital Wisdom

Box 2070, Tappahannock,

VA 22560

USA (804) 7580670

USA (804) 7584512

Allegro New Media

387 Passaic Ave

Fairfield, NJ. 07004

201-808-1992

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## 1.9 BBS

Digital Pixel

USA (001) 416-2981487

Studio Amiga BBS

USA (001) 817-5572111

USA (001) 817-5572112

Toaster BBS

USA (001) 616-7912109

The Graphics Alternative

USA (001) 510-5242780

The Intersection BBS

USA (001) 410-7425452

Lightwaved BBS

USA (001) 510-2280886

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Vertech Design's Graphic Connection

USA (001) 503-5918412

You Can Call Me Ray

USA (001) 708-358611

Pisquare

USA (001) 301-7259080

The New Graphics BBS

USA (001) 908-4690049

GraFX Haus BBS

USA (001) 805-6831388

3000+ Amiga BBS

William Molducci

ITA (39) 0544-451764

3D On Line BBS

Renato Cretella

ITA (39) 089-855276

E.D.E.

ITA (39) 0373-86966

ITA (39) 0373-86023

Mimac IV NeXT Generation 3D House

Fabio Bizzi

ITA (39) 06-7802607

Public BBS

Francesco Di Battista

Luigi Cammuca

ITA (39) 06-9064423

Magicware BBS

Francesco Gambino

ITA (39) 06-52355532

Raytech BBS

UK (44) 1862-83-2020

Another Universe

Stethem Ted

USA (001) 206-6976999

Satlink

Norman Peelman

USA (001) 407-240-7781

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## 1.10 HTML HOME PAGES:

Craig

<http://web.mit.edu:8001/dalamar/www/basement.htm>

"Roberts 3D graphics"

<http://www.heathcomm.no/~robert/bilder.htm>

Fred Aderhold

"Fredster's Page"

<http://www.netrix.net/users/fredster/>

Steven Blackmon

"Steven's Synthetic deLights"

<http://www.websharx.com:80/~kinda/mainmenu.html>

Truman Brown

"HomeWoild"

<http://www.websharx.com/~ttbrown/warpwufg.html>

Mike Comet

"Mike's Home Page"

<http://inswww.ins.cwru.edu:8000/php/comet/comet.html>

Gregory Denby

"Greg Denby's Intersection"

<http://www.nd.edu/~gdenby/>

Andrew Denton

"The Andrew H Denton Art Site"

<http://www.eunet.ch/People/ahd/select.html>

Dan Farmer

"Dan Farmer's Home Page"

<http://www.websharx.com:80/~dfarmer/>

Jeff Fox

<http://lmg.com/upstage/bios/jeff.htm>

Stephen Gifford

<http://web2.airmail.net/sgiff/>

Stephen Gowdy

"Stephen J. Gowdy's Virtual House"

<http://d1.ph.gla.ac.uk/~gowdy/>

Tom Granberg

"Renderbrandt's Home at the end of the Universe!"

<http://www.heathcomm.no/~gfxdude/>

Dennis Grant

"Trog's Cave"

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<http://www.cycor.ca/TCave/>

Torsten Hiddessen

"Hiddi's Raytracing page"

<http://www.rz.tu-clausthal.de/~math/Raytracing.html>

Torgeir Holm

"Torge!r"

<http://www.powertech.no/~torgeirh/>

Conny Joensson

"Conny's Corner"

<http://www.is.kiruna.se/~cjo/>

Scott Kirvan

"Captain Video's Mountain Retreat"

<http://www.websharx.com:80/~cptvideo/>

Bob Landry

<http://www.n2.net/blandry/>

Glenn Lewis

"Glenn's Graphics Gables"

<http://www.c2.org/~glewis/>

Robert Mickelsen

"Secret Spot"

<http://www.websharx.com:80/~kahuna/>

David Nix

"Dave Nix Alias Page"

<http://www.visart.uga.edu/Alias/DaveN/daven.html>

Paul Rance

"Paul R's Home Page"

<http://metro.turnpike.net/P/paulr/index.html>

Jim Rix

<http://yakko.cs.wmich.edu/~jim/>

Rob Sampson

"Home Page for RobSampson"

<http://home.aol.com/robsampson/>

Udo Schuermann

"The World Wide Walrus!!"

<http://www.wam.um.edu/~walrus/>

Sharky

"Shark's Cove"

<http://www.aloha.com:80/~sharky/>

Louis Sinclair

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<http://www.winternet.com/~rundio/>

Ian Smith

"Ian Matthew Smith's Home Page"

<http://www.ncinter.net/~iansmith/>

Christopher M. Stoy

<http://michelle.me.psu.edu/sloth.html>

Greg Tsadilas

"GreG's Electric Dreams"

<http://www.websharx.com:80/~greg/>

Walter Turberville

"Walter (Jay) Turberville (III)'s Home Page"

<http://www.primenet.com/~wturber/>

Rick Beilfuss

<http://www.cswnet.com/~vview/>

Curtis White

"TechnoSoft"

<http://www.teleport.com/~cwhite/>

Andrey Zmievskiy

"Silicon Space"

<http://www.websharx.com/~silicon/>

Craig

<http://web.mit.edu:8001/dalamar/www/basement.htm>

3D Artist

"3D Artist Magazine Home Page"

<http://www.3dartist.com/>

Amiga Technologies

"AMIGA Technologies Homepage"

<http://www.amiga.de/>

Babylon 5

"The Lurker's Guide to Babylon 5"

<http://www.hyperion.com/lurk/lurker.html>

Beyond Imagination

"Beyond Imagination Homepage"

<http://uptown.turnpike.net/H/Herbert/>

Bit.Movie

"Bit.Movie Web"

<http://www.cli.di.unipi.it/bitmovie/>

Future Publishing: Computer Arts

"Computer Arts Homepage"

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<http://www.futurenet.co.uk/computing/computerarts/INDEX.HTM>

IHT Gruppo Editoriale S.r.l.

"Computer Gazette"

<http://www.iht.it/>

IML

"Imagine Mailing List Archive"

<http://d1.ph.gla.ac.uk/~gowdy/Amiga/IML/>

Mesh Mart

"Mesh Mart Home page"

<http://cedar.cic.net/~rtilmann/mm/index.htm>

NewTek

"NewTek"

<http://www.newtek.com/>

POV-Ray

"Persistence of Vision Ray Tracer"

<http://povray.org/index.html>

ReBoot

"The ReBoot Home Page"

<http://uts.cc.utexas.edu/~ifex534/main.html>

Scala

"Myxa Corporation Web Park"

<http://www.scala.com/>

Silicon Graphics

"Silicon Graphics' Silicon Surf"

<http://www.sgi.com/>

Toy Story

"Welcome To Toy Story"

<http://www.toystory.com/>

Viewpoint DataLabs

"Viewpoint DataLabs: Welcome"

<http://www.datalabs.com/>

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## 1.11 SECTION 1 - Support Products/Sites

2] How do I reach Impulse?

Impulse Inc.

8416 Xerxes ave. North

Brooklyn Park, Minnesota 55444

USA

(612) 425-0557

(800) 328-0184

FAX: (612) 425-0701

CompuServe: 72662,3330

CompuServe: 76004,1767 (Mike Halvorson)

WWW: <http://www.coolfun.com/>

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## 1.12 SECTION 1 - Support Products/Sites

3] What was the old Imagine Mailing List

(From the old Imagine Mailing List Sysop, Dave Wickard)

The Imagine Mailing List is a wide variety of Amiga computer artists sharing friendship and knowledge. The main thrust of the List is the Imagine renderer. Subjects discussed though have varied widely. There are discussions of Imagine and it's competitors, Imagine wish lists for future versions, 3D rendering principles in general, single frame recording techniques and many more.

With first day users thru battled scarred veterans :-)) there is someone at Your level of knowledge on the List. We are always glad to see questions from every level of user. So often a simple and seemingly embarrassingly easy question will lead to an interesting comment on a related topic.

New products, both hardware AND software, are discussed as to their relationship with Imagine and Amiga 3D rendering.

Names of Amiga luminaries dot the list, and often join in to lend their insights without the usual "noise" of a USENET newsgroup.

There are over 300 individual sites receiving the Imagine Mailing List, and they include many networks, BBS systems, user groups, and individual computer artists from literally around the globe. We share one thing. Interest in each other's work with Imagine.

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## 1.13 SECTION 1 - Support Products/Sites

4] What is the Imagine Mailing List and how to get it

(From the Imagine Mailing List Sysop, Perry Lucas)

Imagineers,

welcome to the Imagine Mailing List (IML). Users from around the world gather here to discuss different topics of the Imagine rendering package from Impulse. Users share their tips, tricks, ideas, concerns, compliments, dismays, tutorials, FAQs, and many other subjects here on the list.

Currently all 502 members are known as "Imagine Subscriber" on the list. To fix this and make maintenace easier in the future, I ask that You send a message to:

LISTSERV@SJUVM.STJOHNS.EDU

and in Your body of message, write (do not include brackets):

REG [First Name] [Last Name]

Now that You have done that, I bet You want to know how to send messages to the list. To do this, a messages to the IML should be addressed to:

IMAGINE@SJUVM.STJOHNS.EDU

There are several nice features of the LSOFT listserver that You should be aware of, more informations on LISTSERV commands can be found in the LISTSERV reference card, which You can retrieve by sending an "INFO REFCARD" command to LISTSERV@SJUVM.STJOHNS.EDU.

If a friend wants to subscribe or You want to leave the IML, send a message to the listserv address with the following in the body of the message:

SUBSCRIBE IMAGINE [First Name] [Last Name]

UNSUBSCRIBE IMAGINE

Happy rendering...

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## 1.14 SECTION 2 - Modeling and Detail Editor

1] How do I brushmap a ground plane?

The problem with brushmapping a ground plane is that the ground itself is off 90 degrees in relation to its' axis for proper brush placement. (Add a primitive plane, a ground and co mpare them). The following will properly set a ground wrap:

1) Add a ground object, select it, go into attributes, select a brush to use.

2) You will now be in a requestor for the type of brushmap and placement etc...

3) Select TRANSFORM AXIS

4) Click on ALIGNMENT and set X = -90. Leave Y and Z at 0

5) Click on SIZE and leave X = +640. Set Y = +2, Z = +400

6) Click on POSITION and Leave X = -320, Y = -200. Set Z = +1

- 7) Click on PERFORM.
- 8) If you want the brushmap to repeat forever click REPEAT.
- 9) Click OKAY.

Your brushmap will now be placed correctly. You can of course resize it on the X/Z axis if you wish for scaling purposes.

Basically step 4 re-rotated the brush axis properly and 5 and 6 fixed the size and position which Imagine screws up since it thinks it's brushmapping on the other axis.

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## 1.15 SECTION 2 - Modeling and Detail Editor

2] How do I make glass?

You can use the following Attribute setting for a default glass:

RED GREEN BLUE VALUE

COLOR 0 0 0 \*

REFLECT 0 0 0 \*

FILTER 255 255 255 \*

SPECULAR 255 255 255 \*

DITHERING \* \* \* 255

HARDNESS \* \* \* 255

ROUGHNESS \* \* \* 0

SHININESS \* \* \* 0 (Very important see below!)

PHONG = ON

INDEX = 1.50

FOG LENGTH = 0.00

This should give you glass.

One thing many people get confused by is:

1) Shininess must be set to ZERO. If you set this to anything but 0, the FILTER setting will not work. This is just the way Imagine works since FILTER usage assumes shininess automatically.

2) No background. To get glass, you need surroundings. If you render a glass cup on a pure black screen, you'll probably just see the highlights. Adding global colors for Scanline and Ray Trace will give your object something to refract.

3) Ray Trace. To get refraction of surrounding objects exactly, you need to Trace, though scanline WILL approximate

refractivity.

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## 1.16 SECTION 2 - Modeling and Detail Editor

3] The Slice command doesn't work or gives me errors.

Due to the complexity of doing a 3D slice, sometimes Imagine gives errors, or actually crashes during this operation.

Things to do if you plan on using this function are:

- 1) Save \_ALL\_ currently loaded object BEFORE trying to slice.
- 2) If you get an error, move one of the objects slightly and try again. Moving one of them may yield a working slice.

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## 1.17 SECTION 2 - Modeling and Detail Editor

4] I'm making a house which has many rooms and thus many walls, what is the best way of adding walls to the house so that they leave no cracks in the corners ?

Three possible methods ---

1. You can design your walls to be nice dimensions like 100 or 1024 instead of 383.38. Place your axis at the corner of each wall. Then, to get seamless joints, use "snap to grid" in the project editor which will instantly adjust your walls to a perfect fit (If wall lengths are multiples of the grid line spacing).
  2. Create a 2D outline of the floorplan and extrude it up. Then simply pop a ceiling and floor on it. The floorplan could be created either in Imagine or even a paint program and then auto-traced. This means you will have to bust up a few polygons to add the windows and doors, but that is a minor task if you have a complex floorplan.
  3. A cheesy option is to make your walls too big. Then INTERSECT them. You get a mess BEHIND the wall, but if you don't look there, you'll never see it.
-

```
wall 1 |
-----+--
\|/
bug-eyed O.O | wall 2
monster v
|
|
camera X
```

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### 1.18 SECTION 2 - Modeling and Detail Editor

5] When I select a group of points in the DETAIL editor, all I can do is drag them... it doesn't let me ROTATE or SCALE that clump of selected points.

Imagine will let you move selected points, as well as rotate and scale them. The limitation is that you cannot do this interactively in Version 1.1 or earlier by using the mouse: The Transform command does the manipulation. The picked points can be translated, scaled, rotated, and positioned INDEPENDENTLY of the rest of the object. Rotations and scalings all use the object's axis as a reference point. Absolute positioning will move the FIRST point you pick to the location you choose, and the rest of the picked points will be translated an equal amount. Interactive dragging is accomplished using the "drag points" mode.

Note: Versions 2.0 and later support interactive point editing.

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### 1.19 SECTION 2 - Modeling and Detail Editor

6] List of common Index of Refractions (and not so common too!)

(All items except Vacuum are in alphabetical order)

(STP = Standard Temperature and Pressure)

MATERIAL Index

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Vacuum .....	1.00000 (exactly)
Air (STP).....	1.00029
Acetone .....	1.36
Alcohol .....	1.329
Amorphous Selenium .....	2.92
Calspar1 .....	1.66

Calspar2 .....	1.486
Carbon Disulfide .....	1.63
Chromium Oxide .....	2.705
Copper Oxide .....	2.705
Crown Glass .....	1.52
Crystal .....	2.00
Diamond .....	2.417
Emerald .....	1.57
Ethyl Alcohol .....	1.36
Flourite .....	1.434
Fused Quartz .....	1.46
Heaviest Flint Glass .....	1.89
Heavy Flint Glass .....	1.65
Glass .....	1.5
Ice .....	1.309
Iodine Crystal .....	3.34
Lapis Lazuli .....	1.61
Light Flint Glass .....	1.575
Liquid Carbon Dioxide .....	1.20
Polystyrene .....	1.55
Quartz 1 .....	1.644
Quartz 2 .....	1.553
Ruby .....	1.77
Sapphire .....	1.77
Sodium Chloride (Salt) 1 ....	1.544
Sodium Chloride (Salt) 2 ....	1.644
Sugar Solution (30%) .....	1.38
Sugar Solution (80%) .....	1.49
Topaz .....	1.61
Water (20 C) .....	1.333
Zinc Crown Glass .....	1.517

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## 1.20 SECTION 2 - Modeling and Detail Editor

7] How do you make mirrors?

The trick with mirrors (or especially chrome-like objects) is not setting the attributes of the mirror correctly, but making sure that the environment is set up so something will be reflected into the camera.

If a mirror is TOO reflective, the mirror can actually become invisible! This is because the mirror's own flat glass/metal flat coloring is overwhelmed by all the reflected light. You see a PERFECT reflected image, so the object itself isn't shown. This is especially true with flat mirrors.

Some attributes that give a nice mirror polish:

RED GREEN BLUE VALUE

COLOR 150 150 150 \*

REFLECT 200 200 210 \* (a bit of a blue tint)

FILTER 0 0 0 \*

SPECULAR 255 255 255 \*

DITHERING \* \* \* 255

HARDNESS \* \* \* 255

ROUGHNESS \* \* \* 0

SHININESS \* \* \* 0

PHONG = ON

INDEX = 1.00

FOG LENGTH = 0.00

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## 1.21 SECTION 2 - Modeling and Detail Editor

8] How do I make "metals" and what are some good gold attributes?

One thing you can do to make your objects look more like metal is to give them a specular setting close to the main color of the object, but higher in intensity. One mistake is to often make the specular a pure white. This makes objects look more like plastic than metal. For example, if you are trying to make gold, don't make the specular pure white, but try a bright yellow or yellow/orange cream color.

Another problem is that many metals reflect the world. For example a chrome ball is pretty much just a shiny mirror. Thus, if you want to make realistic metals you will need to at least simulate reflection. This can be done by adding a global reflect map, doing a true ray trace or even just setting sky colors in the stage editor.

You can use the following Attribute setting for a default gold:

RED GREEN BLUE VALUE

COLOR 205 205 80 \*

REFLECT 180 160 125 \*

FILTER 0 0 0 \*

SPECULAR 255 255 160 \*

DITHERING \* \* \* 255  
 HARDNESS \* \* \* 255  
 ROUGHNESS \* \* \* 0  
 SHININESS \* \* \* 0  
 PHONG = ON  
 INDEX = 1.00  
 FOG LENGTH = 0.00

This should give you something close to gold. Note that the reflect values are fairly high. You may wish to lower them to see how it would look if you don't have anything to reflect etc...

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## 1.22 SECTION 2 - Modeling and Detail Editor

9] Is there a quick way to add faces to my object without using the Slice command?

Here is a neat trick to add faces. This method works best with an object that is basically concave (such as a circle).

1] Make the outline of your object, i.e.: points and edges.

2] Extrude the object a distance away.

3] Pick all the points that were just made...i.e.: The ones that now comprise the back face. Using Bounding box selection would probably be helpful.

4] Choose Join!

5] Translate the now 1 pt back on the Y axis by the distance you extruded from, and position the point somewhere in the center of the object.

The object is now a solid faced object with all faces connected to one point on the center, just like the primitive disk object.

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## 1.23 SECTION 2 - Modeling and Detail Editor

10] How do I make "wireframe" objects?

There are at least two methods to simulate wireframe objects using Imagine (version 2.9 or higher), the first is memory expensive, it uses the Latticize function, the second uses new Death Star textures family (again, only 2.9 or higher):

- Use the Latticize function and enter a value of about -0.05 in the requester. This will turn your entire object into a wire-

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frame, made up from narrow tubes. If you just want part of the object wireframed, then select the edges you want in Pick Edges mode and perform the Lattice from there. This adds a lot of extra polygons though, a sample primitive sphere (24x12 sections) needs 14,608 bytes before, 92,224 bytes after the Lattice function.

Here's another way for creating the wireframe with square or rectangular wireframe openings:

- Set the objects filter values to 255, 255, 255. Apply one of the Death Star family of textures to the object. Set the Bevel Filter value to 0 (zero). What you get is the bevel portion of the texture showing only. Voila! "Wireframe". Of course, you may or may not want to adjust the bevel width and the bevel slope.

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## 1.24 SECTION 2 - Modeling and Detail Editor

11] How can I create seashells?

Tutorial by Gabriele Scibilia:

The following 10 steps show how obtain a scallop sea-shell (or something similar to it!):

- Add axis

- Add lines like this (use front view):

z

\_\_ ... | ... \_\_

.\_| | \_| +---x | \_| | \_.

-130 .... 0 .... 130

- Invoke the extrude req:

to length 200

scale x 0.5

sections 10

- Add a primitive tube: radius 120

- Scale down the tube: 70% only y (shift-y)

- Adjust the tube position to cut the extruded shape like this:

\_\_\_\_\_

/\

^^ top view

/\_\\_\_\_\_\_/\_\

||

---

cutted cutted

- Select extruded shape then tube and slice them
  - Delete resulting objs except the 2 'planes'
- ('planes' should be part.2 and part.3):

-----\  
part.2 /-----\  
and this top view

-----\  
/\

part.3 /\

\\_ \_/  
-----

- Select first part.2 and then part.3, join them
  - Invoke mold req and conform to sphere:
- sphere radius 100  
object radius 320

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## 1.25 SECTION 2 - Modeling and Detail Editor

12] May I use more than four textures in Imagine v2.0?

Yes and no, to use more than four textures using Imagine v2.0 You can use 'Add axis' function, define texture/s (the axis one/s) with 'Apply to children' gadget on. Now You can group the axis to the object to avoid four textures limit, just one note: this little tip has some side effects with layered textures, just try it.

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## 1.26 SECTION 2 - Modeling and Detail Editor

13] How do I make realistic clouds?

There was several way to simulate 2d "non-realistic" clouds to use as background, You can:

- a. map some digitized pictures on a plane or a semisphere  
(or use a so called scenery generator and/or a mandelbrot generator utility like FractInt);
- b. use a mix of textures like filter noise and color noise

(i.e filnoiz2, colrnoiz2, Imagine v2.9+) on two planes,  
the nearest to camera with white shades, the second with  
gray ones (isnt it overcast?).

How about realistic 3d clouds? I can advise You to map (with flat color map and flat filter map) or to use textures (the ones above) on many planes or shapes one behind the other, it can be a little tip.

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## 1.27 SECTION 2 - Modeling and Detail Editor

14] How do I create visible light beams?

Here it is an extract from a discussion between Charles Blaquiere and P.Sauvageau:

PS> I have find that the best way to make visible light is to use

PS> conical shaped bright objects. I use linear texture to augment

PS> transparency along the y axis, so the cone is semi-transparent

PS> (160-160-160) at the source and full transparent (255) at the end.

CB> In addition, you could use the Ghost or Fakely textures; they

CB> would give you more control over the transparency falloff. This is

CB> off the top of my head, BTW; I haven't actually tried it to see if

CB> it gives better/worse results than plain ole fog.

PS> One thing that I have done is to use FilterNoize applied on a

PS> parent axis, with "Apply to children". When I rotate the light

PS> cone, I do not move the parent axis. This way, you will see the

PS> light beam moving in an immobile cloud of irregular smoke or fog.

PS> One of the problem I encoutered is that Filter Noise seem to

PS> override the linear transparency setting, so the beam do not appear

PS> to vanish as it come farther from the light source.

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## 1.28 SECTION 2 - Modeling and Detail Editor

15] How can I simulate underwater ambient?

(little tip by Curcio Nicholas)

Enter the detail editor and follow these six steps:

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1. Take a sphere and make it a blue color;
2. Remove approx. the top 2/3 of the sphere;
3. Apply the "crumpled" texture (3.x);
4. Apply the "transpar" texture (3.x);
5. Add an axis, and make it white light source;
6. Place the axis above the piece of sphere and group them.

Enter the stage editor, place this object high above your scene; the light coming through the crumpled spots makes a great underwater effect.

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## 1.29 SECTION 2 - Modeling and Detail Editor

16] Does anyone have suggestions for emulating soft shadows?

Again, there are many working methods to simulate soft shadows using Imagine, try these:

- Place two lights in the exact same location. One will have the normal intensity that You want to illuminate Your scene & cast shadows. The 2nd light is less intense and doesn't cast shadows.
- Create a ring of about 10 lights each at 10 percent intensity in a ring. These will create soft shadows as if from 1 100% intensity light source. It does slow down rendering a little to have that many more light sources to have to calculate.
- Simulate soft shadows by using a bunch of lights closely placed on a plane (not a plane object, just a mathematical plane) perpendicular to the stuff You want rendered. You may get some banding doing this, but with enough tweeking, the results are pretty good. Note: The total amount of light coming out of this light-pack should add up to no more than 255 in any one color if You're using non-diminishing light sources. For example, if You are using 10 light sources and you want a white light, set all the color params to 25.5. It's easiest to build all the lights by using axes in the detail editor and then group them (don't forget to make them all shadow casting).

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## 1.30 SECTION 2 - Modeling and Detail Editor

17] Can I create 2d/3d smoke effects? How?

Tips by Andrew Andrew McDonald:

I've just been playing with the Nebular texture to create a little animated smoke. Works great, and I just thought some of you with 3.0 might make some use of this info.

Remember to render fog objects in front of a background object, and that this texture will apply to the area bounded by the texture axis, not the entire object. Scale the texture axis to affect the shape of the fog.

General Notes:

Noise 1 seems to affect the quality of the swirls. Higher numbers adjust the thickness and reduce the transparency. Noise 2 affects color transitions, color intensity of nebular color as set in texture requester, and color mixture, or grain. Grain appears as a very pointillated surface, as if there are thousands of dots of color rather than a smooth gradation or defined boundaries between object and nebula colors. Higher numbers of Noise 2 intensify the nebular color and increase grain.

Fog length and the 'T' value work together to determine amount and density of the fog appearing on the object. For stills I would set the 'T' value between .6 and .8, object fog length at .1, and adjust the 'Fog Length at T' to get the right density of fog. I would use the 'T' value combined with some of the noise values to create a fluctuating fog, or even to morph from a dense fog to one very nearly dissipated.

A nice, swirly smoke might use the following attributes in the nebular texture requester. I used these on a sphere primitive with diameter of 300, so use that number as a reference to fog length.

Object color: R:150 G:150 B:175

Object Fog length: .1

Nebular attributes:

Fog Length at T:500

T:.8

Noise 1 Magnitude:5.0

Noise 1 Velocity:1.0

Noise 2 Magnitude:.2

Noise 2 Velocity:10.0

R:150 G:100 B:225

The texture axis forms a square completely inside the sphere object, whose corners touch the inside surface of the sphere.

Tutorial by Massimiliano Marras:

- Detail editor

- Add primitives: sphere

- Attributes: color 255,255,255 fog 140

clmoiz texture:

color 140,140,140 r,g,b,color vary 0

- Particles: cube

random align

interpolated

dimension 150 units

- Save obj

- Action editor:

- Add particle effect to loaded sphere (to all anim frames)

emission

travel dista 200 units

scaling 1

time to terminal h 2

elasticity 50

time to terminal z TOT/2

velocity .5

min angle x -5

max angle x 5

wind velocity 5

wind angle 33

wind start TOT\*(-1)

wind stop TOT

emission 95%

SET ALL OTHER VALUES TO 0

TOT = number of tot frames

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## 1.31 SECTION 2 - Modeling and Detail Editor

18] How bones work (by Lesk and Mark Decker)?

Tutorial by Lesk:

- Detail editor:

- Add primitives: tube

Radius = 30

Height = 300

Circular sections = 12

Vertical sections = 3

close both bottom and top

Looking the front view You should have a similar shape:

.....

||||| top section

.....

||||| mid section

.....

||||| base section

.....

Note that when we refer to a section that means the points above and below are selected. For example, the top section is:

.....

|||||

.....

The last row of points is used twice, once for top section and once for mid one.

- Select tube
- Mode, pick faces
- Pick method, drag box
- Shift select top section (points above and below)
- Functions, make subgroup, tip1
- Deselect faces
- Shift select mid (all pts above and below mid faces)
- Functions, make subgroup mid1
- Deselect faces
- Shift select base section
- Functions, make subgroup base1
- Deselect faces
- Shift select top and mid section
- Functions, make subgroup midall
- Deselect faces
- Shift select top, mid, and base
- Functions, make subgroup baseall
- Deselect faces

If you think about this for a minute it will all make sense especially concerning how this thing is going to bend.

- Mode, pick groups
- Pick method, points
- Object, add axis
- Select this axis
- Move axis to center of tip1 (top section)
- Deselect axis
- Object, add axis
- Select axis
- Move axis to center of mid1 (mid section)
- Deselect axis

- Object, add axis
- Select axis
- Move axis to center of base1 (mid section)
- Deselect axis

Now comes the tricky part the order here is very important and

You may have to try this a few times until it works just right.

Use the find requester and choose the axis in the base section, doing it this way should make the order correct.

- Mode, pick object
- Select axis for object
- Shift select axis in base1
- States, group
- Deselect
- Select axis in base1
- Shift select axis in mid1
- States, group
- Deselect
- Select axis in mid1
- Shift select axis in tip1
- States, group
- Deselect

What You have done here is simply grouped your axis. You now want to make certain that these axis are in the proper order so that when You bend say Your finger, they move just like Your finger would top to bottom. If they are out of order it will still work but it would look like some double jointed contortionist...

Go back to group mode and check this out, and make very certain that the order is right. Click on the tip axis and it should be the only one blue. Deselect it and click on the axis in the mid section, both it and tip axis should be highlighted. Deselect them and click on the axis in base1 and all three axis should turn blue. Now the hard part: go back to pick object mode and then click on the object axis, it should be blue with a yellow line connecting it to the base1 axis.

If none of the above is correct all progress is at a halt, go back, remove all the groups and try it again this order is important!

So either clear it all out and start the project over or go back to group mode, select an axis and ungroup, repeating until everthing is ungrouped. Make sure there are no groupings at all! Then go back to object mode pick and sadly start again. You will get this, it just takes a little practice. Also this is not a replacement for the manual read through it so You have the concepts, believe me it will really help.

Now having that done correctly we can move on make sure nothing is selected and go back to pick group mode.

- Select axis in tip1
- States, bones subgroups

bigsub: browse tip1

smallsub: browse tip1

- Select axis in mid1
- States, bones subgroups

bigsub: browse midall

---



smallsub: browse mid1

- Select axis in base1
- States, bones subgroups

bigsub: browse baseall

smallsub: browse base1

- Save entire object/group now

If you think about this it really makes sense what has happened at this point.

- States, create default state
- Select buttons shape and grouping
- States, create start state
- Deselect all
- Select axis tip1 and rotate in the x 30 degrees
- Select entire object
- States, bones update
- States, create bendtip1
- Select axis in tip1 and rotate another 30 degrees in x
- Deselect all
- Select axis in mid1 and rotate it in x 30 degrees
- Select entire object
- States, bones update
- States, states create midbend
- Deselect all
- Select axis in tip and rotate 30 degrees in x
- Select axis in mid and rotate 30 degrees in x
- Select axis in base and rotate 30 degrees in x
- Select entire object
- States, bones update
- States, create basebend
- Save entire group again
- States, make stateanim

start

15

bendtip

15

midbend

15

basebend

15

start

---

0

- States, play stateanim

I sure hope this works for You and if You find any errors or things that just don't work feel free to let me know.

Tips by Mark Decker:

I learned a few things that might help somebody else along:

1. Once you are in Pick Objects, pick first the parent axis, then the child axis. In Lesk's tube example, if the axes are numbered from top to bottom, first pick axis number two, then hold down shift and pick axis number one and group. Next pick axis number three, then hold down shift and pick axis number 2, and so on down selecting the object itself followed by the "root" bone and grouping them last. When I first tried this I was using the bounding box to pick both axes at once, and I think it may have been picking them in the wrong order.

2. It helps immensely to move any axes out of the way (shift M moves the axis of an object but leaves the object in place) so that they do not overlap while grouping. Once the grouping is correct, you can move the axis back into place without affecting the grouping.

3. Subgroup assignment is probably the trickiest procedure and was at the start the hardest part for me to grasp. It has not been well explained to date, but I'll see if I can help without muddying the waters any further. Each axis gets two subgroups assigned to it, helpfully referred to as "Big" and "Small". To the best of my understanding, the Big subgroup is the set of all faces which will be affected by motion of the axis. If a face is not in the Big subgroup, its never going to change no matter what that particular axis does. The Small subgroup is a subset of the Big subgroup, which means it can only contain faces which are also in the Big subgroup, but usually won't contain all of them. The Small subgroup moves and rotates with the axis, but all of its faces keep their shape and orientation with respect to each other. So if the faces outside the Big subgroup don't change, and the faces inside the Small subgroup don't change shape, all that's left is

he faces which ARE in the Big subgroup, but ARE NOT in the Small subgroup. These faces form the actual joint, and actually stretch and deform to keep the other two sets (the outside and the Small subgroup) smoothly connected. Maybe an example will help. Think of a robotoid arm with no fingers, no wrist. It has two parts, a forearm and an upper arm, and hence two bones (axes). The parent axis (bone) sits at the center of the shoulder, with its Z axis pointing at the elbow. The child axis sits at the center of the elbow, with its Z axis pointing at what in a more highly evolved robotoid would be the hand. You need two subgroups for each bone. Lets start with the forearm. The Big subgroup for the forearm will include all of the forearm and just a little of the upper arm above the elbow, enough to allow the joint to stretch to maintain a smooth connection. The Small subgroup will contain most of the forearm, up to just below the elbow. The faces around the elbow which are in the Big

subgroup but are not in the Small subgroup will be the ones which stretch and deform to allow the joint to connect smoothly. On the upper arm, the Big subgroup will contain all of the forearm, all of the upper arm, and a little of the shoulder it is attached to. The Small subgroup contains all of the forearm, and most of the upper arm up to just below the shoulder. Again, it is the faces between these two where all of the deformation takes place.

4. Once your grouping is all set up, go back to Pick Groups and pick the actual object which is the parent of all these bones. All the axes should be turn blue (in the default color scheme) to indicate that they have been picked as well. Then create your "DEFAULT" state, being sure to select both Shape and Groups. You may need to select properties as well if you want to do brush or texture tacking, but I'm still having problems with this myself, so I'm not sure.

5. In order to manipulate the bones, you need to be in Pick Groups mode. You have to pick the axis you want to manipulate, rotate (or move) it, and accept the change. To see the result you have to pick the base object again (still in Group mode) and select Update Bones and it will then warp your object to conform to the new bone positions.

This has gotten a lot more long winded than I intended, but I hope it helps clarify a few things for someone.

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## 1.32 SECTION 2 - Modeling and Detail Editor

19] Halo around light sources: the glow effect.

There are several ways of doing this. The first method works under version 2.0 and 3.0, it takes the most work, but looks terrific if done correctly. The second method works under 2.0 and 3.0, and is easier, 3.0's version looks better due to the textures involved. The third method use Lens Flare and works only under 3.0.

You can refer to an easy example, a simple lightbulb. Think 2D for a bit, remember that the visible lightsource described is the type You'd see on film. What's a light look like? Well, there's a central disk of light that seems to be a constant brightness, the bulb itself. As You go further outward a secondary disk of light surrounds the central disk: this is the first halo, it is roughly twice twice the size of the central disk. It fades out rather quickly, it's, essentially, the part of the light that "burns" the film. Go further outward. There's a second halo, it's very dim and eventually fades out. This halo varies in size, but can usually be set to eight times the size of the original disk. This is the halo that is create when the light is dispersed by atmospheric conditions. So with that in mind:

Radial texture method:

- Create a disk using Imagine's standard disk parameters.
- Copy the disk and scale the new one by a factor of two.
- Copy the larger disk and scale the new one by a factor of four. You should now have three disks of varying size.
- Position the disks so that the smallest is in front of the middlesized. The middlesized is in front of the largest.
- Make the smallest disk Bright with a Color of 255, 255, 255.

Also, make it a lightsource.

- Apply Radial textures to the middlesized and largest disks.
- The middlesized disk should be Bright and have a Color of 150, 150, 255. The Radial texture should be set so that the disk's transparency is set to 0, 0, 0 at the center. Create a transition distance over the radius of the disk so that transparency is 255, 255, 255 at the disk's edge. You want the disk's color to fade as it moves toward the edge of the disk.
- The larger disk should be Bright and have a Color of 255, 255, 255 and a Transparency of 170, 170, 170. Set the Radial texture so that the color fades to total transparency (255, 255, 255) at the disk's edge.
- Transform the smallest disk's axis ONLY. Bring up the Transformation Requester, Rotate the Z axis 180 degree. Select the Transform Axis Only button and Perform. The disk's Y axis should be pointing exactly opposite the other disks' Y axis.
- Group the three disks together using the smallest disk as the Parent.

This is a basic "Light w/halo" object. When rendering it be sure to always point the Y axis at the camera. It's easy to do: just Align Y axis to Track to Object Camera. Render that, and see what You get. In this example the smallest disk acts like the bright lightbulb, the second disk acts like the film burn area, and the third disk acts like the atmospheric dispersion area. The object, being 2D, has some limitations.

A primary limitation is that this object only works well in Scanline situations, this is because in Trace Mode the two larger Radial mapped spheres block the smaller disk's light travelling backwards. To work around it create an axis, make it a Lightsource, place it behind the larger disk, group it to the smallest disk. It isn't infallible, however...

Experiment with values. The Color values given above were for a standard high intensity lightsource. Always remember what Your lightsource would look like in the real world.

Fog method:

- Create a primitive sphere.
- Make it Bright with the Color values 255, 255, 255.
- Copy the sphere and scale it slightly larger than the original sphere primitive.
- Make this sphere a Fog object by experimenting with Fog Length values. Color it as necessary.
- For those with Imagine v3.0 assign the Ghost texture to the foggy sphere, experiment with values.

If You're using Imagine 3.0 You can use the Sparkle texture. If You've downloaded Milan's textures (BTW, Thanx, Milan!) there is one itx in there that is useful, but my memory fails me as to the name. I don't have Essence, so I don't know what there might be in there. Hope this helps...

Here it is a more accurated step-by-step tutorial to create a glowing point light source based on this "Fog method":

- Create a primitive sphere (Radius: 10.00).
- Set the Fog Length value to 3.00.
- Add the Ghost (Imagine v2.9 or higher) texture as follows:

Column One Two

```

_____
1500 0
1 0
0 0
0 0
0 0
0 0
0 0
0 0
0 0
0 0

```

- Add Fakely texture:

Column One Two

```

_____
0 80
0 80
0 200
0 130
0 130
0 255

```

0.95 0

0 0

- Make the object a Light Source.

Lens flare:

You could use the Lens Flare effect that comes with Imagine 3.0, just disable the flaring and have only the halo turned on. Easy.

Add a light in Imagine Stage Editor. "T" to transform the Axis. Make the size much larger than the default, make it 200 or even more. In the Action Editor, add the Lens Flare Global FX. Render!

This has always been in Imagine, but the default size is just too small! Remember, don't scale the light, transform it using "T" or Action Editor.

For added effect (actually, in lieu of the FX if You're pressed for render time... but the two TOGETHER work great...) create a ball or tube around Your light and make it Bright and Fogged. Track to camera. Render!

Follow this steps to create the light streak:

- Add a primitive tube (Radius: 10, Height: 100, 4 sections).

- Rotate y, 90 degrees.

- Translate axis only z, 50 units.

- Set axis Align to 0, 0, 90.

- Set axis Size to 10, 10, 10.

- Drag box, multi pick left most section points, scale them by a scale factor of 0; repeat for the right most section and for central one points.

- Multi pick the two other sections points and scale it 75, x only.

- Enter Attributes requester and set Light parameters (Red Intensity: 600, Green: 600. Blue 1500, Round Shape, Parallel Rays).

- Modify the following attribs:

COLOR REFLECT FILTER SPECULAR

R 70 0 0 0

G 144 0 0 0

B 255 0 5 0

Dithering Hardness Roughness Shininess Fog lenght Phong

255 0 0 0 5.00

- Add GHOST:

Column One Two

\_\_\_\_\_

200 0

0.7 0

0 0

0 0

0 0

0 0

---

0 0

0 0

Remember the Global Lens Flare effect and modify the light streak y axis size to affect halo size; You could use this to simulate explosions, just modify the size and use some sort of explo anim brush filtered mapped plane.

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### 1.33 SECTION 2 - Modeling and Detail Editor

20] Can a reflective object inside a glass tube render properly?

You have discovered one of the famous "behind glass" raytrace bugs that have ALWAYS plagued Imagine. You also cannot get a glass attribute inside a glass attribute object to render! There is NOTHING you can do but try to fake the effect (i.e. wrap a brushmap around your sphere to imitate the surroundings, maybe a global brushmap would work?)

A possibly solution is to copy your glass tube and scale it slightly smaller or larger so you get a double-walled tube. You have to use a global map and an animated chrome spheres going up the tube. They all reflected the global map correctly.

So, what you should do is to make the glass-tube have both an inner AND an outer wall (make two tubes, one slightly smaller than the other and join them to a single object). Then put your chrome ball inside.

The secret is that the ray has to travel trough two (2) faces with glass-attribute-settings (or any other transparent material for that matter).

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### 1.34 SECTION 2 - Modeling and Detail Editor

21] Help with Slice function, By J. Goldman.

Slice is so weird. Here are a few things I've discovered about Slicing.

Interestingly, you can Slice anything. You do not have to have multiple objects to perform a slice.

So what? Well, most of the slice problems I've run into arise from messed up object geometry. For instance, say you want to use boolean functions to create a complex object, \*NEVER\* Join and Merge objects you want to later Slice. It doesn't create sliceable geometry, always Slice objects together and then Merge, this usually insures good geometry.

To find out whether an object will perform well under a Slice, perform Slice on the single object itself, if you get errors the object will not Slice well in the future.

If that single object actually separates into multiple parts it means the object didn't have continuous geometry to begin with. Usually because of duplicate points. It probably won't slice well in the future.

Here's an example. Slice a primitive sphere, it should result in one sphere.

Now take two spheres, Join and Merge them and Slice. You'd think it would act like a single object. It should Slice to itself. If you do not get an error you'll get multiple objects proving that the object geometry was bad.

In any case you must fix the geometry. If your object errors you are fairly screwed unless you have a saved copy of the object with good geometry (i.e. an object saved before a function messed with its geometry).

---

If your object splits into multiple objects you must Merge those objects to create continuous geometry. Here's where I'm not sure what is really true. Can someone confirm this?

If you Merge an object duplicate points are not eradicated, if you Merge an object in Points Mode duplicate points WILL be eradicated. Is this true? If so, then to Join Sliced objects you should Merge objects AND points.

So, as advice try Slicing each individual object to be sliced. Make sure those are okay. If they are, Slice 'em. Merge (or Join and Merge) the resulting objects/parts the way you want (deleting unnecessary parts), and Slice the new object. If THAT'S okay then the next Slice should work.

I've gotten into the habit of testing the 'Sliceability' of every object I will Slice and every object I have Sliced. I rarely run into problems.

The one downside to Slicing everything (as opposed to just Joining) is that your poly count goes way up.

Imagine does need a better Slice/Boolean function...

Of course, if it's an edge to close to an edge problem you could just offset one of the objects to be sliced slightly...

Hope some of this helps...

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## 1.35 SECTION 2 - Modeling and Detail Editor

22] Fog object and global fog: undersea fog spotlight.

Tips by Dylan Neill:

I was reading through an old IML archive and saw that someone said that fog objects didn't work in global fog. Well I got news for you! It does! So I've made a little underwater scene with low rolling hills along the ocean floor and a submarine that appears from out of the fog. Ok so heres how you make a cool fog spotlight...

- Add a primitive cone (and leave it OPEN at the bottom for the best effect)

- Press F1 to select it

- Go into attributes

- Set the fog length to 50

- Make it bright

- Add the ghost texture with these settings:

150 fog length at T

1 T

- Hit OK and OK to get back to the detail editor

- Add an axis

- Select it with F1

- Go into the transformation requester

- Click position and type 100 in the Z box. Then OK

The axis should be sitting on the top of the cone.

- Rotate it -90 degrees around the X axis so that the Y axis

points down into the cone.

- Press s and scale the whole axis object by a factor of 1.56 and press space

- Press s then l then shift Y to and scale it by a factor of 2.

The Y axis should now reach all the way down the cone.

- Go into attributes

- Click light

- Click on point source, round shape, cast shadows

- Click OK

- Add the light texture 'softedge' with default settings

- Click OK to go back to detail editor.

- Select both the axis and the cone and select group

- Save it

And now you have a fog spot light to rival those of Lightwave. One thing to note though is that you must keep the wide end of the object hidden in what ever you're lighting up. eg. if you are pointing it at the ground, scale it so that the wide end is underground. You can make another one which has a closed bottom but it doesn't look rounded like this one. Render two, side by side and find out.

Notes by Randy R. Wall:

Well, I can tell you why you think the fog object is working and that's because you have the ghost texture added to it, but I can tell you if you take this texture off the object it will not render the fog thicker for the object. In fact even with the Ghost texture it still doesn't look completely correct at the edges. Try using it with a thick global fog and you will see what I'm talking about.

It does produce an effect similar to what one would expect, and in a light fog would probably work just fine. But I wouldn't go so far as to say fog objects do render correctly. Try a fog object with a nebula, fogtop or fogpaint textures and you will see that the fog object becomes clear in spots.

Anyways, I'm not knocking your fog spotlight. It probably works great. It looks familiar to something I posted a tutorial on for 2.0 a long while back. But modified a bit for 3.0. Not that that's what you did. I'm just saying it looks familiar, but then many effects do.

But Fog objects by themselves still do not make the fog thicker.

But on the other side this can produce a nice shield effect for something.

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## 1.36 SECTION 2 - Modeling and Detail Editor

23] Disco ball effect: how simulate some sort of radiosity.

Alan Gordie:

Last night I was trying to do a disco ball effect, you know like saturday night fever:)

I made a primitive sphere and scaled and rotated selected points to make angular patches on the sphere then made it reflective 90% and put it inside of a box (extruded plane) then aimed two lights from 2 angles. Ok so far, but...

...when I render, I can see the reflection of the light on the wall in the sphere, but the light shining off the sphere is not hitting any of the walls...argh



Is this something which Imagine cannot do or am I doing something wrong?

Curcio Nicholas:

No raytracer (that I know of) can do this. To reflect lights you need a radiosity raytracer. These aren't too common and take forever to render scenes.

What you could do is make some sort of transparency map (or use the `transpar.itx` texture with something else as I did with the underwater lighting) and put a light source inside the disco ball so that the light shines out from the ball.

Goldman:

Actually, it's something ray-tracers in general can't do. Scenes are rendered opposite to convention. That is, a ray is traced from the camera to a light, not from the light to the camera. Therefore, light reflecting off of objects, bouncing, and in turn hitting other objects is not possible.

A technique exists, called Radiosity, that attempts to simulate "real-world" lighting effects. Unfortunately, Imagine (as well as the majority of commercial software on the market) does not have this rendering capability. It's just as well since the process is extremely processor intensive (read: takes a loooong amount of time), though the results can be stunning..

Since 3D visualization is just a simulation anyway, you can fake the effects with several well placed lights or textures.

I suppose you could make an inner sphere with lots of holes in it. Stick a point lightsource in this and have the whole thing rotate. It wouldn't be the best method (points of light would be sharp), but it would do.

Anyone know what would happen if you made a sphere totally transparent, but totally reflective? Would a lightsource (with shadows enabled) pass through it? Would the object look like glass from the outside (because of the high reflectancy) at the same time? If so, then take your original sphere object, give it 255, 255, 255 filter, and 255, 255, 255 reflect values. Hopefully, the inner sphere will act as a gobo/cookie thing while the outer sphere gives the impression of the disco-ball glass.

Craigh:

Sorry, ray tracing doesn't work that way (usually)...You need radiosity. The portion of the wall will check to see if lights are pointed at it when it is being shaded, but will NOT check to see if REFLECTED light is impinging upon it.

One way to do this:

Use Scanline rendering (or ray-tracing, but make sure the new lights are outside the disco ball if using ray-tracing). Set up a cluster of multi-colored blinking spotlights inside the disco ball that rotate with it and point outward.

The original lights will illuminate the disco ball and the new lights will illuminate the wall with the spinning/blinking effect seen in your favorite disco-theque! This will also allow you to use a nice lens flare since the new spinning spot-lights will occasionally point directly at the camera!

Randy R. Wall:

No Imagine won't bounce light off of objects (yet). But you could probably make a good fake for it using a Sphere with the RadWind and Transpar textures. And an axis set to a point source light inside of the sphere.

I haven't tried this but am sure with some work it would shoot little squares all over your walls as you rotate your disco ball. One problem I can think of is you may not be able to have the nice reflective look that the object you have already tried. But then with the correct setting it might be possible. Maybe the metal texture set to chrome on the sphere as well might help?

I'm only guessing with all of this but do believe the Transpar texture will be the key to success.

Randy R. Wall:

Well, sense I had nothing else to do I thought I'd give a quick try at that Disco Ball and see if what I thought would work would.

I think it works pretty nice, but there were a few things I did not try sense I wanted to post something for you before I hit the sack.

Anyways, heres what I did for a fairly simple Disco Ball, but one that still looks and works nice.

- Add a Sphere
- Load the Chrome Attribute
- Add the RadWind texture and set it to:

Radial Scale -1.0 Color 1 R 255.0

Z Scaling 3.0 Color 1 G 0.0

Sweep Division 20.0 Color 1 B 0.0

Fraction 'On' 1.0 Color 2 R 255.0

Dist Travelled 0.0 Color 2 G 255.0

Min Spacing 0.4 Color 2 B 255.0

Max Spacing 0.4 Reflect Adj 1.0

Transparancy 0.0

The colors can be changed to what you like, but its a good idea to have one a darker color so that when the Transpar texture lights the walls with the little squares some of them will be darker than others.. It maybe a good idea if you are going to have a couple of colored lights hitting the Disco Ball to use a grey color like 100,100,100 for the dark color and 255, 255, 255 for the lighter color.

Anyways on to the rest of the Disco Ball.

- Now Add the Transpar texture and leave it at the defaults

- Now Add an Axis to the center of the ball and set it to a

Point Source Light and Cast Shodows.

Now your ready to render it.. If you don't have a lot of things to reflect or lots of glass objects you maybe able to speed things up by setting the RSDP in prefs to 2. If you do have a lot of things to render than set it to what need be. But if you want to test out the Disco ball so you can set it up how YOU like it then I would recomend putting it in a box with an open end for viewing and set RSDP to 2. This should work fine for these test.

The only thing I found I didn't like about it is the squares are all the same distance apart, but the dark and light colors help break this up a bit as well as having the windows Min & Max Spacing fairly large. You could make these smaller to make the Ball look a bit better but I didn't like the sqaures on the walls so close together when I did this. But then I was testing it in a fairly small box.. I think in a larger box it might look quite good. Especially if there were other things in the room for the squares to interact with.. Anyways something for you to play with..

Well I hope you like the looks of it. I tried the Mosaic texture on it and that looked pretty cool too, but not quite right. I think these Disc Ball actually have many different shapes on them so the produce different shapes on the ground. But the Mosaic texture was a bit to much. I was going to try a combination of a couple of texture, but thought it would take a while to play around with this and really only wanted to see how my suggestion would work sense I was only guessing about it. And sense it did work I figured I'll leave the playing around with the textures for you..

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## 1.37 SECTION 2 - Modeling and Detail Editor

24] How can I create a candle flame?

Tips by Torgeir Holm:

Take your basic candle-flame ellipsoid shape and add the following attributes:

Fog Length: 0.10

Texture: Ghost

Fog length at T: 400

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T: 0.8

Texture: FogTop

Fog length at T: 200

T: 0.5

Noise Magnitude: 0

Place the axis so that the origin is in the tip of the flame and the bottom of the bounding box is 2/3 towards the bottom of the flame. With the Z axis pointing up.

Texture: Fireball

Color1: 255,255,100

Color2: 200,030,000

Noise: 0

Reflect&Filter 1&2: 0

Place the axis so that the origin is in the bottom of the flame and the end of the Y axis is in the tip.

BTW: my object was about 60 units wide, and 150 units tall.

You can now add a child axis in the middle of your flame and make it a lightsource.

To animate this, make sure the Y axis points upward (do this before adding textures, as their placement is relative to the axis), and move the the object up along a wavy path with conform to path. Then move the path back down a mirror copy of itself, so that the flame stays in the same position. Makes a really nice and realistic candle-flame.

Tips by Mike Rivers:

If you have version 3.0 or higher, here's a free candle tip:

- Make a brushmap with a vertical gradient from the white (top) to black (bottom).

- Then make another brushmap that is solid white. Apply the gradient map to the candle as a 'reflectivity' map and apply the solid white map as a 'reflection' map. This makes the candle stick glow like a real lit candle.

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## 1.38 SECTION 2 - Modeling and Detail Editor

25] What are the differences between Spin and Sweep functions?

(By Pierfrancesco Parente and Robert Byrne)

Spin uses the Z axis of the object as the pivot point and the first and last points should be at the same X coordinates otherwise the object will be lop-sided. Sweep, on the other hand uses the first and last points of the outline as the pivot.

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If You Spin this object the top will be closed with its centre offset. If You Sweep it the top will be open and symmetrical.

You have to remember:

- BOTH Spin & Sweep use the Z axis as the pivot;
- Sweep rotates ALL the points of the outline around the pivot;
- Spin rotates all the points of the outline BUT the first and the last ones, which just remain in place.

Spin is useful when trying to build a closed top/bottom lathe object (paying care that the first and the last points of the outline fall right on the Z axis), since Sweep fails in this. Also Sweep is to be used when the outline to be spun is a closed one (e.g. when making a torus of a circular outline) since Spin is definitively not recommended for this.

SP & SW always rotate the object along the local Z axis of the object, so You can obtain different kind of rotations by moving or rotating the object's axes only (select "Transform Axes Only" in the Transformation Requester or press the Shift button in interactive mode).

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### 1.39 SECTION 2 - Modeling and Detail Editor

26] Modeling strategies: modeling hands, feet, etc...

I've noticed a few questions asking how to model complex shapes such as hands, feet, talons etc. I use a variation of the rotoscoping technique to model some very complex objects.

The way it is done is to first digitise or draw a 2D version of the object You want to model (to model a humanoid I've used a digitised version of Leonardo DaVinci's drawing so I'll use that as an example). The picture must be a two colour iff (for Amiga users) with the shape filled completely. Use the detail editor's Object/Convert Iff/Ilbm menu selection, and click on Don't Add Faces (You can let Imagine add faces if the object is not too complex, but it's risky).

Extrude the resulting shape to the default values, then create a primitive plane with as many points as you think You will need for the object (for DaVinci's human I used the default 10x10 plane). Scale the plane until it's at least twice as big as the object (no

need for precision), and move it so that the bottom quarter cuts through the middle of the extruded object (to minimise problems with Slice) . Then shift-pick both objects and select Object/Slice from the menu.

Once slice has done its stuff You'll be left with all the objects grouped together. Switch to Pick Object mode and pick and delete all the objects except the cutout shape. Extrude the cutout to the default values, except with 3-6 rows depending on how complicated Your object need be (I used 4 for DaVinci's human). Go to Pick Points and Drag Box mode and shift-pick the top layer of points, scale them to make a rounded profile, and do the same for the back.

Shift-Move the axis to the neck and use Pinch, Shift-Move the axis to just below the chest and use Taper.

Switch to Pick Faces mode and go the bottom of the legs. Shift-Pick the lowest faces at the front of the legs (use Fracture if You need more points), extrude to form feet, and voila - a (very rough) bones-ready human.

I already have a few heads, hand and feet (made the same way) ready to splice onto any human I make, and I find it handy to keep this rough shape in my objects collection. With a bit of detailing it can be made into a variety of different people.

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## 1.40 SECTION 2 - Modeling and Detail Editor

27] How can I create neon lights?

Tutorial by Mike McCool:

Using a path, created in the shape of the desired neon, I extruded a disk (align Y to path, and the more sections, the smoother the tube will look -- but the longer it'll take to render).

Next, I extruded a second disk, smaller than the first, but along the same path. What You want is a tube within a tube.

Invoke attributes on this second, inner tube, and make it the desired color of your neon. Also, make it a Bright object.

Invoke attrib's on the first, outer tube, and leave it the default color, all white, and in Fog Length, type in 100. You want it a fog object. The fog tube gives the neon its 'glow.'

Delete the path, and group these objects, and You've got Your neon tube.

Here's where the fun begins, and the appearance of Your tube will depend on how You plan to use it. For that NeonCool pic, ala Aminet, I made all the inner tubes, the colored ones, lightsources. This works fine for neon floating in black space -- but if You want it to actually illuminate something, or have it sit in front of a wall, or a backdrop picture, you have to be more subtle with your lighting. Otherwise, You'll be completely washed out with colored light, and the effect of the neon tube will be lost.

I uploaded another pic to aminet; I think it's in pix/trace, and it's called LouvreAtHome, in which my 'cool' neon letters are mounted on the back wall of a room. To get the right effect of glowing tubes, I found it best to have only a couple of the letters of the 'cool' sign actual lightsources (I picked the o's, for symmetry). I added an axis to the original 'o' object, made it a Lightsource, with a color to match the color of the desired neon.

You've played with lightsources already, so you know it takes some tweaking to get the desired effect. You don't want the neon to wash out the entire scene, so experiment with the Lightsource options (Control Falloff, Diminish Intensity) to get the look you want.

Please note that I do NOT deserve credit for this method. My tutorial is based on a compilation of advice from several Imaginoids. I'd list their names, but that portion of my brain that retains relevant memories was accidentally drained during a routine flush operation.

Tutorial by Granberg Tom:

Make Your Object, make it bright, put the fakely texture on it, adjust the colors to Your liking. Bright color in the center and a darker one at the edges.

If You use tubes (disk) object as Your base for extrude's, it will not make any difference to where your camera is placed, due to the fakely texture it will make the vectors facing the camera brighter than the others (vector normals). Now go to the Action

editor and add the haze global effect, type in the same values You've put in for the side color in the fakely texture. This way You get a good neon effect even in scanline.

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## 1.41 SECTION 2 - Modeling and Detail Editor

28] How can I get a checkered plane with checks of different textures?

Two planes are used to create the effect.

The plane on top has it's object attribute filters values set to 255, 255, 255; it has the CHECKS2 texture applied to it also. You may apply the first texture to be used on the checker board.

The plane on the bottom, positioned 0.5 units below the top one has the second texture You'd like to use, the CHECKS2 texture isn't needed: the filtering of the first plane allows the second plane to show through were the CHECKS2 does not apply its color values.

You can also let the top plane filter values 0, 0, 0 but change these in CHECKS2 parameters.

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## 1.42 SECTION 2 - Modeling and Detail Editor

29] How can I simulate the effect of a bright light reflecting off

thousands of tiny particles suspended in air?

A lot of You have been talking about using a fog object to simulate the effect of a bright light reflecting off thousands of tiny particles suspended in air (well thats what it is). Here is a sort of short thing You can try to further the effect:

- Add a cone.
- Make it white and bright.
- Add the textures FILTNOIZ and MNTTOP.
- Add the MNTTOP texture, align the Z axis so its running down

in the direction of the light. Adjust the length of the Z axis so the axis reaches all the way to the end of the cone.

Make the texture color white, the filter 255, 255, 255 and reflect 0, 0, 0.

Now comes the fun part: the noise settings can be anything, anyway use numbers that are relatively low, i.e. magnitude .5 and velocity 1.0.

The filter noise is really just an addition to help make the texture appear blochy. Why? Because "the distribution of particles in an area is not perfect throughout the entire area but rather, more highly 'active' in some, although the average of the area is generally the same as other areas", anyway, add the texture and make the Z axis align with the cone (like the previous texture). Then make the "size" larger in the Z direction than in any other. Finally make the amount of noise high to cut up the spheres.

The effect should fade with distance and have the little bloches. The MNTTOP texture should go second not first in the list.

Well, you could always add an empty axis as the parent of Your object and apply the textures to this parent axis. Make sure the "Apply to children" button is activated in all textures and You have a group where the actual beam of light is free to move but the textures will stay fixed in space. Now You can animate Your object through states without touching the parent and the textures will follow world coords, producing the spotlight-in-smoky-room effect You want.

Any fog textures that need to go on the object itself (such as Fog Top, or Ghost) don't need to be mapped to the parent. These could go directly on the cone, since they don't deal with the noise effect, but rather with the fog length of the object. Adding the nebula texture to the parent might look good though.

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## 1.43 SECTION 2 - Modeling and Detail Editor

30] I still have questions about the bones feature, let's say I had a "can" object of coke and I want to make it dance.

Tutorial by Rick Valleyview:

I have plans for writing a tutorial to make an animated figure (bones, constraints, edge fill, etc), all that's needed is time.

For now I'll assume You know the basics of bones.

Let's make a can with 3 sections. To make bones work decent You should at least have 1 or 2 sections in between Your bone sections (the more sections, the smoother the bends). So we'll make a can with 7 vertical sections.

Put an axis at the bottom of section 1 (the bottom one), section 4, and section 7 (top). In the attribute requester name them bot, mid, and top.

Enter Pick Group mode. Click on mid, then top: Group them. Click on bot, then multiclick mid. Group them. Click on the can axis (which now becomes the parent), then multiclick bot. Group them.

Make this Your "DEFAULT" state.

Pick Face mode. Multipick the top row of points (faces of top of can). Make this Your Small Bone Subgroup for the "top" axis. Multipick the top 3 sections of the can. These are Your Big Bone Subgroup for "top". Multipick the top 4 sections of the can. Make these Your Small Bone Subgroup for "mid". Multipick the top 6 sections of the can. Big Bone Subgroup for "mid". Multipick all sections of the can and make Your Small Bone Subgroup for "bot". We'll also use all sections for Big Bone Subgroup for "bot". This allows us to deform the whole can without moving the "bot" axis.

There are two ways to twist our can.

Direct method:

Pick Group mode. Pick "top" or "mid" and rotate them around Z. Click on can axis. Click on "Update Bones" menu item. We can also rotate around X or Y to bend the can over. Try it.

Set "State" to "DEFAULT".

Inverse method:

Pick Object mode. Pick can axis. "Freeze" all world axis. Pick "Constrain" menu item. Pick "top" axis. Rotate and see all 3 axis rotate different amounts. Pick Group mode. Pick can axis and "Update Bones". Again You can also move, which affects all the bones to bend the can.

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## 1.44 SECTION 2 - Modeling and Detail Editor

31] Constrain, freeze, release: inverse kinematics.

Let's first look at bones. Bones objects are like a family, You start with a parent, then have children, grandchildren, etc.. Any bones object can have any number of children but will have only one parent.

There are two ways to manipulate bones objects, directly (there probably is a better word) or inversely.

When You move an object directly, You're moving from a parent's point of view. Any manipulation to You affects all of Your children, grandchildren, etc.. In Imagine You do this by picking in "Pick Group" mode any bones axis and manipulating it. This will also move, rotate, etc.. any bones objects that are down the family tree from it.

When You work inversely (Inverse Kinematics) You are working from the child point of view and affecting all of the way up the family tree. In Imagine You do this by clicking on the "Constrain" menu item.

For example, take a human-like object.

In direct mode click on the thigh "bone". Rotate it and the shin bone and foot bone move with it.

In inverse or constrain mode click on the foot bone. Rotate it and all of the other bones in the body move. This is because You are affecting up the family tree, and parents always affect down the tree to the other children.

This is where "freeze" comes in.

First click on the hips bone (?) and click on "freeze" menu item. Check all of the axis in world. This freezes the hips from moving. Now go back, click on "constrain", move the foot bone. The shin bone and thigh bone move with the foot bone but nothing else. You can also use "freeze" to only limit movement to certain axis. In the above example You could keep the shin bone to move only as a knee would bend. Some programs even allow You to limit movement in an axis to a certain number of degrees or range of movement.

As it seems to me, direct mode is useful to pose a figure or object in an unusual pose or where placement is more on looks than on exactness. Inverse mode is useful to position a piece of an object in a certain place.

For example, use direct mode to position a cheerleader's arms. Use inverse mode to place a person's foot up on a step.

Make sure You watch what mode You are in! Direct mode use Pick Group mode and inverse mode uses Pick Object mode.

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## 1.45 SECTION 2 - Modeling and Detail Editor

32] Inverse kinematics: getting started, By Randy R. Wall.

Well I am pretty new to the Kinematics in Imagine but I'll get You started so that You can experiment. First make three axis making one and then copy it and paste it down twice. Now pick Axis.1 and then set it's Z position to 50 (using the Transformation requester). Now set Axis.2 Z position to 100. Select the bottom Axis and the Axis.1 just above it by using the Shift key as You select it. Group them together and then click anywhere on the screen to unselect these Axis. Select the middle Axis.1 and the top Axis.2 and group them together. Ok this is a basic bone structure or group, if You select the bottom Axis while in Pick Groups mode all of the axis will be selected. So with this I can explain to You SOME simple kinematics... at least enough to get You started.

Go into Pick Objects mode (Kinematics will only work in this mode). Select the bottom Axis and and then select Freeze: in the Freeze menu set Rotation World X, Y and Z on. Set Constrain and select the top Axis.2 of the group and press M. If You are in the quad view (all four views showing) You can go in the top view and rotate Your pointer around the Axis. You will see that all the axis follow the pointer as You move it but the bottom one stays stationary and does not rotate with the others. If we unset the Rotation World X, Y and Z it would follow along with the other axis. If we wanted to limit this group more we could do the following.



Set ALL axis so Rotation World Y and Z are set, un-set the bottom Axis's Rotations. Select the top axis and try rotating the pointer around the axis in the top view, as You can see the axis now only move along the Y axis or should I say will only rotate on the X axis. As we have limited its movement by only letting it rotate on X. Hit the spacebar, undo this and select the Right View Bar.

Now we can make the axis move in a more controllable means. Select the top axis again, press R and then X and move the pointer to the right slowly till the axis angle is at 45 degrees. Imagine will tell You this at the top right corner of the menu bar. The top axis will rotate on its X axis. Press M and move the pointer to the left and slightly down. As You can see the top axis keeps its alignment of X and all the other bones or axis bend to make it look like a finger bending. This may cause a problem if You move to far but You can either try moving it back and try again or hit the spacebar, select the middle axis and press R then X to rotate the middle axis into the correct position.

If You wanted to stop the bottom axis from causing this problem You could Freeze its World Tranlations and then move or rotate the top axis to the position or alignment You want and, un-set the bottom axis Translations and Rotate its axis on X to rotate the whole group. Or to do a similar effect keep Your top axis free to move and rotate, You could rotate the middle axis into the angle You want and then Lock it's X Joint, select the top axis and move or rotate it's X axis. By doing this the bottom and middle axis stay aligned to each yet still follow the top axis and leaves the top axis free to manipulate...

Ooops! typo on my part it should read: set ALL the axis so Rotation World Y and Z are set.

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## 1.46 SECTION 2 - Modeling and Detail Editor

33] Phong edges, By Charles Blaquiere.

Remember that Phong shading interpolates the surface normal between the current face and the neighbouring face, if the connecting edge is not flagged "sharp". An example:

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| 0
| 1
| 2
| 3
_| 4
5
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When modelling a wine glass, You'd typically have long faces on the sides of the glass, leading to tiny faces representing the top surface of the rim (obviously, my diagram is upside-down. Mmmm, let's make our object a glass cover that fits over the cheese tray. Yeah, that's it).

The numbers represent some abstract kind of angle, with 0 representing surface normals that point to the right, and 5 those that point downwards. You see how the surface normal changes all over the large face, from 0 to 5, all because of the tiny rim. This causes the "flat areas seem to bulge like pillows" problem familiar to new 3-D users.

The standard ways to get around this are:

- define the connecting edges as sharp. This is fine, if You want a sharp look to the corner.
- create intermediate faces between the vertical and horizontal faces.

The second strategy will soften the effect, but the long vertical face's surface normal will \*still\* vary towards the normal of the next, almost-vertical, face.

In my modelling bag of tricks I have a solution that allows me to have my cake and eat it too: perfectly flat-looking areas where I want them, soft corners where I want them, all with a minimum of faces to keep object complexity down.

I just model the large, flat area in two parts, and make the edge part really skinny. I can then leave all edges soft, so there won't be any discontinuities, yet the large flat area will look perfectly flat.

l0

l0 l = large flat area (one set of faces)

l0

l0

l0 I = another set of faces, parallel to the large

l0 set. Should be very narrow, just running

\_\_\_\_\_l2.5 along the Edge that connects to the horizontal

5 3.7 face.

In this case, both "l" and "I" faces have a surface normal of zero, and "\_" faces have a surface normal of 5.

The "\_" and "I" normals vary from 5 to zero as expected. The big difference, however, is that the "l" edges have normals that vary FROM ZERO TO ZERO. Badabing, badaboom.

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## 1.47 SECTION 2 - Modeling and Detail Editor

34] How do I obtain a nice sparkle off the edge of a wine glass or chrome object (By George deBeaumont)?

I've got a quick thought on how to achieve a sparkle type of effect in an animation. Presumably You want something less intense than a lense flare, but something more than a simple specular highlight... the result of what one would see in real life from some minor imperfection or poorly seen detail on a rotating reflective object.

I'd approach it this way:

- Create a primitive disk with even number of sections (lets use 12). Select every other point (pick points mode) and scale down (result = six point star).

- Apply the Fakely texture to the sparkle object, TYPE NUMBER = 2 (this will affect the filter value of the object only), CHANGE THRESHOLD = 0.9 (this will make the sparkle object visible only when it directly faces the camera), SIDE RGB = 255, 255, 255, FRONT RGB = 0, 0, 0.

- Group the six pointed star to the object needing the sparkles. Make sure to orient it such that it becomes visible (directly faces the camera) at the desired point in Your animation. Each sparkle object will now remain invisible until its plane is perpendicular to the Y axis of the camera.

Anyway that's the basic idea. You'd probably want to use multiple sparkle objects (with slightly different orientations) and keep them relatively small. You might want to experiment with other shapes as well.

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## 1.48 SECTION 2 - Modeling and Detail Editor

35] Imagine something hairy....

Hair in Imagine...

I've been working on a 'fur ball' character and have found that though You can produce hairy like objects from a distance with careful use of brushmaps and sometimes a little fog to soften the edges, the only way to really get good looking hair in Imagine is to use particles.

Try a default sphere, make it a particle object and point it to an object file containing a single triangle polygon, set align to faces and random object size.

Make the base of the triangle about half the height of the triangle, it should be oriented with the sharp point up the Z axis. Set the filter values of Your sphere to about two thirds clear and brush map a browny/black patchy image (Your hair map) onto it using spherical mapping. No specularity/ref lect/shine should be used. Try a quick render and resize the axis to produce a better covering of hair, also adjust sphere filter value to reduce the effect of the triangles particles looking like triangles (additive effect of filter layers).

With a little tweaking this produces a very good fluffy ball. You might want to place a dark solid sphere inside the hair to make it look solid.

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## 1.49 SECTION 2 - Modeling and Detail Editor

36] Brick quicky, By Conny Joennson.

(Based upon a "3D Artist" article by Alex Lindsey)

The idea was that he wanted to make a whole wall made of individual blocks (or slabs, if You like) of stone, and they had to be \_very\_ detailed because that's what his customer had ordered.

The "how-to" was written for Form-Z on the Macintosh (yurk, spit!) but the technique proved to be apliquable (pun) on Imagine as well. And here it is:

- Start up a (new if You like) project
- Go to the Detail Editor
- Add a primitive plane (200, 150, 1, 1) and pick it
- Zoom the perspective view so that the plane covers the whole view
- In attributes, add the Clouds texture with default settings
- Quickrender, this will take \_quite\_ a while
- Save the quickrender somewhere
- Delete the plane
- Add a new plane (200, 150, 20, 15) and pick it
- Go to Pick Points mode and select pick method Drag Box
- While holding the shift key drag a box around all points but those at the outmost edges of the plane

- Translate the picked points -10 units in Y
- In the top right and low left corner will be a couple of polygons that will still lie flat along the original position. If You like (and I personally did) You can delete the edges that are lying flat and add two new (correctly oriented) faces in each corner
- Go to Pick Groups or Pick Objects mode
- Select the Applique function, and use the cloud quickrender that You saved just a little while ago
- In the applique requester select transform axes, Translate the brush +5 units in X and Z. Size it 10 units smaller than the original values in X and Z
- Accept these settings and wait for the plane to be appliqued. If You are not satisfied with the result you can always "undo" it and applique it all over again using another Y size for the brush

- Now You should have the basic shape of a rough cut rock block

To make it all really look like a rock block you will have to colour it rockily (maybe using the concrete texture or - as the guy who wrote the article - a colour cycled and filtered version of the clouds brush) and You will also need to use a good bump map to simulate the grains and pores in the rock's surface.

I tried to use the leather texture to simulate the pores but that was no hit, I can tell You.

What I can tell You is that Alex L. managed to produce some very realistic rock blocks using this method, and given some time to experiment with this technique I am sure that I will be able to do so too.

The exact same technique could be used for making a basic landscape. I still haven't tried that, but I will (when I can find the time...). Perhaps using the Mountain Top texture... hmmm...

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## 1.50 SECTION 2 - Modeling and Detail Editor

37] Realistic glass, By Lumbient.

This uses Imagine v3.3 mapping features.

Revelations:

Yesterday I was sitting there with a plastic glass (is that possible?) and I picked it up, stared in amazement. I said to myself, "that's why Imagine can't create glass". What I had seen was specular spots from every light in the room cast on the material not in spots but rather linear, up and down along the surface. Well I know Imagine can't do this, so I set out to try to fake it (geez that's all why nowadays is fake everything). Well I also noticed that the specularity along edges (like the rim of the glass or the bottom edge) is very hard and intense. The final thing I noted is the way it reflects more light at the extreme angles formed by the viewer and the cup at the sides (yeah I don't understand what I said either :) ) what I mean is look at the sides of a glass, see the sides are more reflective than the front.

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Application:

Here comes the fun part. I made a map that was 1 x 200 pixels that had black and white spots along it (more white than black). This is the Hardness map for the cup and the Reflect map. Then I made another map that had the same dimensions but this time has black, white, blue, and tan spots. This was the Specular map. Finally I made a 200 x 1 pixels map (yes that's it, it's not backwards) this time I had 1 pixel of black at the top and a few of black at the bottom then I blurred them. This is the second Hardness map. Apply the last map first with full intensity. Then apply the Specular map with a mix value of 0.75 and then the second other Hardness map with a mix value of 0.40. Finally add the Reflect map with a mix value of 0.80. Also I applied a tif named "clouds.tif" (some of you may have this) as an Environment map with a mix value of about 1. I applied another Environment map: the same map used for Specular with a mix value of 0.50.

ALL of the maps with the exception of the Environment maps are cylindricly mapped.

The object attributes are:

COLOR REFLECT FILTER SPECULAR

R 255 40 250 150

G 255 40 250 150

B 255 50 255 140

Hardness Roughness Shininess Brightness Index of refraction

24 0 0 0 1.01

Location:

I decided not to place it on a checker board floor :) Instead I made a ground plane and placed the texture BATHTILE on it. The plane is also shiny. Above the scene are two spotlights casting shadows. The camera is placed just above the rim about a foot away.

Well there it is!!! The values for the maps may have to be altered and for some like the Hardness map the color may have to be inverted.

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## 1.51 SECTION 2 - Modeling and Detail Editor

38] Extruding 3D objects, By Steven Blackmon.

Extruding 2D objects into 3D objects has obvious uses. Not so obvious is the purpose of being able to extrude fully 3D objects like tubes and spheres. This tip/trick demonstrates the use of this technique to add solidity to objects that normally appear paper thin.

The basic example assumes little knowledge of Imagine. It does assume that you know how to move from editor to editor, and that you know the basic layout (i.e. what and where the user gadgets are, what a requestor is, etc.). All steps are described in extreme detail that may be mind numbing for more advanced users of Imagine.

The goal of this example is create a tube with thick sides.

- Enter Detail Editor. Add a primitive tube to the workspace.

Use the default settings for all tube parameters, make sure the Close Top and Close Bottom buttons are unmarked.

- Pick the tube.

- Bring up the Extrusion requestor, enter 150 in the Length

entry box, make sure You hit the return key to make the change active, leave all other settings as is and Perform. You should now see two tubes joined by faces at the top and bottom.

The key to this step is making sure the extrusion length is large enough so that the new points do not overlap the original object.

- Change to Pick Points mode, use either Lasso or Drag Box picker to pick all the points in the second tube (the one near the top of the screen in the Top View). Make sure you DO NOT pick any of the points in the original tube.

- Once You have the second tube's points picked, enter the Transformation requestor. Click the Translate button, and the cursor will now appear in the X: entry box. Leave X: set to 0 and change the Y: entry to -150 (don't forget to hit the return key) and then hit the Perform button. The second tube created by the Extrusion in step 3 should be on top of the original tube. Make sure You leave the second tubes points picked. You will then have to repeat step 5.

The key to this step is to set the Y: translation value to the negative of the value You entered for extrusion length.

- Now You need to Scale the points in the second tube. Either hit the Scale user gadget, or just hit the 's' key. Once in Scale mode, hit the 'z' key to prevent scaling along the z-axis. Move the mouse to the left with the left button depressed until the Scale Factor in the status bar reads 0.80, hit the spacebar to finish.

- As a final cleanup step, enter Pick Edges mode. Use the Drag Box in the front view to pick all the edges along the top and bottom of the tube. Don't forget to hold down the left shift key for multi-pick mode. Make Sharp Edges. Constant update subscribers can choose Edge Filter from the menubar and simply accept the defaults once in Pick Edges mode. This will pick all the edges that should be made sharp. Then choose Make Sharp Edges.

Congratulations, Your tube now has thick walls! Try this technique on other objects. For example, instead of a tube, try using a sphere. Make sure to delete some of the points on the sphere, or the extrusion step will simply make an unattached copy of the sphere. Better yet, choose Latticize accepting the default settings. Once You have a latticized sphere, perform steps 2-7. The only change is in the scaling step. Leave all 3 axes active, set the scale factor to 0.98 or 0.96. This procedure will create a THICK lattice that is much more realistic.

The advanced example assumes a working knowledge of Imagine.

We are going to use a temporary project file, use the Shredder F/X to fracture a heavily subdivided sphere, save a snapshot in the Stage Editor, extrude the fractured sphere in the Detail editor, then recenter and scale the new points.

- Enter the Projects Editor. Create a New Project called 'TEMP', or some similar name.
  - Go to the Detail editor and add a heavily subdivided sphere (Circle and Vertical divisions = 36, Stagger Points: ON) and save it.
  - In the Action editor, set the Frame Count for the temporary project to 30. Add the sphere and set Start Frame=1, End Frame=30.
  - Add the Shredder F/X to the sphere. Change the settings until You have a sphere You like. You will have to jump back and forth between the Stage and Action editors, tweaking the numbers until You get a fracturing You like in one of the animation frames. OR You can try the following Shredder settings, which look good in a 30 frame animation at frame 7:
    - \* Start frame: 1 End frame: 30
    - \* La Machine: ON
    - \* Maximum triangles in Group: 8
    - \* Start / End time (seconds): 0.0, 1.0
    - \* Explosion Timing Delay (%): 10
    - \* 'Hold at' frame number: 0
    - \* Bounce: ON
    - \* Flip on Bounce: ON
    - \* Ground Z position (Imagine units): -100
    - \* Use Average bounding sphere: ON
    - \* Elasticity Min/Max (%): 5.0, 15.0
    - \* Initial Velocity range Min/Max (m/s): 1.0, 1.0
    - \* Triangle Rotations Min/Max (rot/s): 0.0, 0.1
    - \* Particle Trajectory Min/Max (degrees): 0.0, 45.0
    - \* Final Scaling Factor Range Min/Max: 1.0, 1.0
    - \* Imagine Units per meter: 20.0
  - In the Stage editor save a Snapshot of the fractured sphere from the desired frame. If You're using the settings above, take the snapshot in frame 7.
  - In the Detail editor, Extrude the fractured sphere 150 units. Pick the newly created points with either the Lasso or Drag Box.
  - Translate the new points via the Transformations requestor -150 units along the Y axis.
  - Scale the new points by 0.1 in all three axes.
-

With a little texturing, You have the basic busted spheres from Steven's Emergence picture.

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## 1.52 SECTION 2 - Modeling and Detail Editor

39] Negative scaling: mirror feature, By Gregory Denby.

I know You all know that but....

When an object is scaled to -1 on any of its axes, via the Transformation requestor, it is mirrored on th at/those axis/axes. This means that one only needs to model a portion of an object that has axial symmetry. If You make the axis the exact center of an object, such as a human face, when You have finished modelling the right side You only have to do a few things to finish the left side. Copy the object, open the Transformation requestor and scale to -1 on the "x" axis. The object will now have been reflected. Paste the original side back in and Join the two parts. Tah Dah!

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## 1.53 SECTION 2 - Modeling and Detail Editor

40] How Smoothing tool works (By Bill Dimech)?

This uses Imagine v4.0 Smoothing tool.

I have just been playing with the new Smoothing Tool option in Imagine. This is very powerful and I got so excited I had to post this little tutorial that shows some of its power.

In the Detail Editor:

- Add a default torus.
- Add a sphere with a radius of 100 units.
- In the front view: move the sphere about 150 units in the X direction so that the left side of the sphere intersects about half way through the right side of the torus.
- Pick the two objects and Slice (ALT-x) them (You may need to raise the sphere a touch if You get the intersecting edges error).
- In Pick Object mode: select the newly created intersecting bits between our two objects and delete them. We want the original outer torus and sphere parts only.
- Pick the torus and sphere objects and use the Join command to create one object.
- Merge it (this is important!!! If You do not merge, it will not behave as expected).



Now for the fun stuff:

- Select the new Smoothing Tool option from the functions menu:

change the iteration value to 20 and apply it to our new object.

Notice how nicely the join has been smoothed. WOW! Great potential here. You can apply the Smoothing over and over to increase the effect.

Ok, that's not all..... This next bit shows up best if the perspective view is in Shaded Mode:

- Pick our object, change to Pick Faces mode and Pick ALL faces.

- Fracture it.

- Now select the Smoothing Tool option from the functions menu

again, set the value to 10 and ensure that Lock Perimeter is on.

Click on OK.

When You apply this to our object, look at the Shaded View as this really shows up the benefit of this feature (if lock perimeter is off the object will distort. Start to merge into a blob: yet another great feature).

Note, the Smoothing Tool works in Pick Faces mode as well as Pick Points and Pick Object.

You can select a range of points or faces to localise smoothing if necessary (i.e. to the intersection of the two objects only etc).

Try out this Pick Faces / Fracture / Smooth routine on the SKULL object that came in the Digimax directory, WOW!! Finally, an easy way to clean those ugly DXF files that come from those other packages.

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## 1.54 SECTION 2 - Modeling and Detail Editor

41] Receiver, a Smoothing tool example, By Gabriele Scibilia.

This uses Imagine v4.0 Smoothing tool feature, it is based upon a Lightwave Metaform tutorial by James Trew.

In the Detail Editor:

- Add axis at 0, 0, 0.

- Pick select, Lock to grid (grid size is 20 units), Add lines.

- Click left mouse button to the following coordinates:

0, 0, -40; -20, 0, -40; -60, 0, -20; -80, 0, -40;

-100, 0, -40; -100, 0, 0; -60, 0, 60; 0, 0, 60.

- Enter Mold requestor, Sweep: sweep angle 360, 8 sections.

- Copy and Paste object.

- Transformation, position the new object to 460, 0, 0.

- Transformation, align the new object to 12, 0, 90.

- Pick the original object and align to -12, 0, 90.

Now we model the handle:

- Add axis at 200, -25, 50.

- Pick select, Lock to grid, Add lines to:

80, -25, 0; 40, -25, 60; 180, -25, 80; 300, -25, 80;  
 420, -25, 60; 380, -25, 0; 280, -25, 20; 200, -25, 20;  
 80, -25, 0.

- Enter Pick edges method.
- Pick the upper 3 edges (multipick), Set edge line.
- Pick the remaining edges, Fill to edge line.
- Pick object method.
- Extrude the shape 50 units.
- Pick all faces, Fracture.
- Pick object, multipick all objects, Slice.
- Delete the intersecting resulting objects.
- Join and Merge all objs.
- Pick all faces, Fracture, Smoothing tool, smoothing factor to 10.

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## 1.55 SECTION 2 - Modeling and Detail Editor

42] Creating springs, spirals and coils, By Stephen Gifford.

Well after seeing a discussion on the difficulty of making spirals in Imagine I decided to do a little experimentation. Here are the results. The following tutorial does not contain any groundbreaking discoveries but for those who may be interested....

How to make yer' basic snail shape in 60 seconds or less!

- Add a primitive disk in Detail, and accept defaults.
- From Pick Points mode, delete center point.
- Still in Pick Points, select remaining points and move circle to the left in front view so that edge of circle touches disk's axis.
- Still in Pick Points, rotate all points -90 degrees in X axis.
- From Pick Object mode open Functions/Mold/Extrude requester, change Y Rotation to 720, X Scaling - 0, Y Scaling - 0, Length 60.00, Sections - 40. Select OK and tadaaa!

By adjusting Length of Extrude and Y Rotation You can get a different look. No kidding!

Yer' basic coil or spring in under 60 seconds or less!

- Add a primitive disk, set Radius to 10 and points to 12.
- Turn on coordinates, from Pick Points mode in front view move all points 50 units to left of axis (put mouse in center of axis when moving points to judge distance of 50 units).

- Rotate all points -90 Degrees in X axis.
- From Pick Object mode open Functions/Mold/Extrude requester, change Y Rotation to 2000, Length to 200, and Sections to 200, select OK and voila!!!

If You want to make more of a spring shape simply change the disk shape to a rectangle and repeat above instructions. Changing spring shape to have proper sharp edges however is not easy and will take more than 60 seconds.

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## 1.56 SECTION 2 - Modeling and Detail Editor

43] Modelling tips, By Tom Granberg.

[Hide points.](#)

[Hard edges.](#)

[Splitting joined objects.](#)

[Lightning: small craft lights.](#)

[Bitmap texturing: hull plates.](#)

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## 1.57 SECTION 2 - Modeling and Detail Editor

Hide points.

When modeling complex objects, You often need to hide points cause they clutter Your work space. When You are building the different parts of Your object, and do this from the very beginning. Pick faces and make them subgroups, this way You get two very important advantages:

- You can hide each subgroups from Pick Points mode by selecting Hide Points and then select Pick Subgroup;
- You often find that making edges sharp is not always that simple but one method is to use the above technique. Go to Pick Edges mode and select Pick Subgroup, You get a choice to pick the outline (boundary) edges of that specific subgroup.

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## 1.58 SECTION 2 - Modeling and Detail Editor

Hard edges.

The Edge Filter tool is very usefull but sometimes it does not do what You want, especialy on complex "twisted" objects. I found You can actually use the tool in a reverse order: pick all edges, make them all hard, use the Edge Filter to pick the edges You want be smooth.

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## 1.59 SECTION 2 - Modeling and Detail Editor

Spliting joined objects.

Sometimes You have made a object or get one that is joined in a way that You cant use. Trying to pick the faces You want can be a real nervwrecing experience by trying to hide and hazzle around to get those faces. Well, here is a fast and painless method: allmost all joined objects have one thing in common, they consist of a non-consistant "mesh" and this is a fact You can use to Your benefit. Go to Pick Faces mode and pick a few faces on the part You want to split into a new object, then use the Pick More tool until Imagine stop picking more faces. Warning, some objects DO have a consistant "mesh", if this is so You are forced to use the old method, by hiding and picking by hand. Ofcourse a smart thing is to first check for subgroups....

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## 1.60 SECTION 2 - Modeling and Detail Editor

Lightning: small craft lights.

If You look at a spaceship, aircraft, boats, etc, You'll see a lot of small lights on it. To put them on a 3d modell is a piece of cake, but to constrain it so it doesnt light up Your scene as a nuclear explosion, the easiest way to this is to turn on shadow casting. This will severly damaging Your rendering time. But if You use the controlled falloff flag in the light attribute, You can control where the light will no longer affect anything. This is done by scaling the axis "shift scale" the lenght of the axis is where the light will have effect.

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## 1.61 SECTION 2 - Modeling and Detail Editor

Bitmap texturing: hull plates.

The key element is not so much the shape but the surface variance. Our eyes are very good at telling us what's fake and what's real, and often tricked by "unseen" details. These details are not always easy to do. Imagine v3.x have some new and very usefull bitmap mapping tools that will help us with this.

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If You download some of my bitmaps at the 402u page, You can easily see what I mean.

When You use a bitmap for the main surface, take a duplicate and use a image processor to highten the contrast by about 25-40%. Use the first as a color map, I almost all the time put dirt on it as well. If the map has to many hard details "white spots" use the mix/morph and fade it a bit until it feels right. Put on the second enhanced image and use it as a specular map.

For further details duplicate it and use it as a hardness map. The two first mapping methods however gives the most dramatic change in the "look", the hardness mapping only adds a faint effect, that is sometimes needed. But if You dont specificy need it, don't, use the overall hardness setting instead, since further mapping will increase Your rendering time.

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## 1.62 SECTION 2 - Modeling and Detail Editor

44] A first Imagine project, By Gregory Denby.

Menu items will appear in ALL CAPS. Various Imagine objects or features will appear with the first letter Capitalized.

1. Project Editor

2. Detail Editor

3. Action Editor

4. The Stage Editor

5. Project Editor, rendering Sub-Project  
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## 1.63 SECTION 2 - Modeling and Detail Editor

1. Project Editor

After starting Imagine, and "esc"aping the opening screen, the Project Editor appears. In the upper bar, the status reads "No Project open". Use PROJECT/NEW to start one. A requestor, "Project Name" will appear. Chose any name You like, but this tutorial will use "First". Type the name in the string gadget at the bottom, and hit enter/return. All Imagine requestors require pressing enter/return to record the information. Next, pull down EDITOR/DETAIL\_EDITOR. This will move You to the Detail Editor, where You'll make some objects.  
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## 1.64 SECTION 2 - Modeling and Detail Editor

### 2. Detail Editor

When in the Detail Editor, use the menu OBJECT/ADD/PRIMITIVE and click on Sphere. Accept the default settings, a sphere will appear in the view windows at position 0, 0, 0. It will already be "picked" and colored orange. Now PICK\_SELECT/PICK\_SELECT. The object turns blue, You may now click on the button along the bottom that reads "Mov" or hit "m", the Sphere turns into an amber box. Click the mouse in the top view, drag to one side. The amber box will move aside. Press the Space bar and the sphere re-appears.

Once again, use the menu OBJECT/ADD/PRIMITIVE and click on Tube. Change only the height setting, click in the box, type 300, and hit enter/return. As above, the Tube needs to be moved away from its initial place. This time, click on the Front View, click on the button along the bottom that reads "Mov" or hit "m". Pull the amber bounding box down about half its height, and press Space.

You might also have used the OBJECT/TRANSFORMATION command to move the Tube. If You had, You would have needed to click on the Position button and typed -150 in the Z gadget. After hitting enter, and clicking Perform, the Tube would have moved to this position.

Now use the menu OBJECT/ADD/CLOSED\_PATH. An oval Path will appear around the Tube. The Sphere will later follow this Path to move around the Tube.

Adding some color to the objects will make the final animation a little clearer. Move the mouse cursor in any view until it's over the axis of the Sphere, click there to activate the Sphere and then pull down the menu FUNCTION/ATTRIBUTES or press F7. The Attribute requestor will allow You to adjust color, roughness, textures and many other parameters. In this example, only the color will be changed. Click on the Color button, type 255, 0, 0 in the red, green and blue boxes (hit return after each). As You'll see in the color swatch, the Sphere is now red. Click OK to exit the requestor.

Repeat the above with the Tube but make the color blue.

The objects need to be saved. The Tube should still be selected. When You OBJECT/SAVE, the requestor will allow You to find the "first.imp" project. When You click on that line, You'll see the sub-directory "object", click on that. Type "tube" in the bottom string requestor and hit return to save the Tube there. You might have placed this anywhere, but it is easier to remember if objects are associated with their Projects. Upon return to the Detail editor, use OBJECT/DELETE to remove the Tube from the work space.

Now click on the Sphere and repeat the save and delete routine. Finish by saving and deleting the Path. Now it's time to pull down PROJECT/ACTION\_EDITOR.

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## 1.65 SECTION 2 - Modeling and Detail Editor

### 3. Action Editor

The Action Editor allows You to set the length of animations, add various actors, set global parameters and apply special effects. In the upper left hand corner there is a box labelled "Number of Frames" which is set initially to 1. Click in this box, enter 36. You'll see that You now have 36 frames available for an animation.

Upon entry into the Action Editor, two actors are already present, these are the Camera and Globals. The Camera has several values already defined for the first frame. By default, You are in the INFO mode, which allows You to inspect and change values assigned to any actor. You may click on any of the defined bars, Size, Position, and Alignment, and view or change the default entries. At this point only look at the values for the Camera and Globals.

Next use FUNCTION/ADD to start placing the actors You created in the Detail editor. Click first in the upper left corner of the first vacant row below the Global actor, under the frame number 1. On the far right, the word Actor should be highlighted. The

Status bar above should say "Starting frame is 1. Choose ending frame". Move across to frame 36, click again. You'll now be presented with three options, namely Normal Object, Light Source, and Axis. Click Normal Object. The requestor that pops up should still show the name of the last object saved, the Path, with Sphere, Tube and Path available in the upper list. Click OK. Another requestor will appear which could allow You to add State and Motion data but just hit OK for now.

Move down another row, and, as above, add the Normal Object Sphere from the list in the requestor. Repeat for the Tube object. At present, all the objects are loaded in at the same co-ordinates as those from which they were saved in the Detail editor. In a few moments, the Sphere's position will be altered.

You still need to add a Light Source and an axis to which the Camera will track. You should still be in the ADD mode. When You define the Actor bars, this time You'll select Light Source and Axis respectively, just accept the default values presented.

You now have all the actors for the animation. You still need to define the Sphere's position among the frames and where the Camera points. Change to FUNCTION/DELETE, find the Camera alignment bar. When You click on it, it will disappear. Now FUNCTION/ADD, click over frame 1 and then 36. You will be asked to chose among Tween alignment or Track to Object. Select Track to Object and type Track in the resulting string requestor, the Camera is now instructed to follow the axis named Track throughout the animation.

Go to the Sphere, use FUNCTION/DELETE and remove its position. Now FUNCTION/ADD a position bar from frame 1 to 36, when asked to choose among Tween Position or Follow Path, select Follow Path. Type Path in the requestor. The Sphere will now be positioned incrementally along the Path during animation.

The next operations will occur in the Stage editor.

**IMPORTANT:** use PROJECT/SAVE\_CHANGES!!! Otherwise the work You have just done will be lost. You may now exit to the Stage via the menu function PROJECT/STAGE\_EDITOR

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## 1.66 SECTION 2 - Modeling and Detail Editor

### 4. The Stage Editor

Upon entry into Stage You'll see the three objects You defined in Detail. The Camera is visible in the Front View as a circle with a small line sticking out of it. To see where the Camera is focused, use DISPLAY/CAMERA VIEW. The image in the Perspective view now shows what the Camera is seeing. You should be too close to see anything but the Tube. In the Front view, click on the Camera, in order to activate it for moving. Once selected, use DISPLAY/ZOOM\_OUT several times. Click in the right view, use the "Mov" button on the gadget bar, the camera now turns amber. Drag it towards the left in the Right view, at the same time note how the bounding box representation changes in the Perspective view. When the Camera can see everything, hit the Space bar to drop the Camera.

This position must be saved. First it's necessary to place Imagine in the "local" mode. Press the "Loc" button on the gadget bar to do this, use OBJECT/POSITION\_BAR. Next PROJECT/SAVE\_CHANGES. The Camera's new position has now been recorded.

The Light Source needs to be moved away from its default position of 0, 0, 0. Because the axis for the Path and Track are at the same location, use the PICK\_SELECT/FIND\_REQUESTOR command. Click on Light Source in the resulting requestor, and then OK. A circle at the center of the view is now Picked, use PICK\_SELECT/PICK\_SELECT to activate the Light for moving. In a fashion similar to the Camera, move the Light Source away from the center, drop the Light near the Camera, be sure to be in local mode and save the Light's position just as the Camera's was saved.

Before exiting the Stage You'll want to preview the animation. Use ANIMATION/MAKE and just hit enter/return when presented with the requestor reading 1, 36, 1. You will be asked which method You want to use for the anim pencil test, namely, Full Objects Only, Use Object Settings or Bounding Boxes Only. Select Full Objects Only. Imagine will then proceed to step through each frame, moving the Sphere around the Tube along the Path. When this is done, use ANIMATE/PLAY\_LOOP. The wire frame anim will probably be too fast. Use the "Slow...Fast" slider on the anim controller panel that appears when the anim is played to

slow it down. When the anim plays smoothly just Stop it and return to the Project editor. When You SAVE CHANGES at exit the rate of display You set in the test render will be used for the final anim.

Had the preview shown that the Sphere had moved out of view, You would have needed to once again reposition the Camera. At some later date You will want to try moving the Path or the Track around to see how these effect the anim.

Now use PROJECT/SAVE\_CHANGES, then PROJECT/PROJECT.

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## 1.67 SECTION 2 - Modeling and Detail Editor

### 5. Project Editor, rendering Sub-Project

In order to use the 36 animation frames now available the screen size and color depth as well as the animation format must be indicated. This is done clicking on the New button just below the words Rendering Subproject. A file requestor is then invoked, in the bottom string gadget type "Small" and press enter to create a Sub-project. You now are given access to the sub-project control panel. Find the box in the upper right that reads "Scanline", make sure it's clicked on. Next, press the button named Presets just below. For this session select "PC Lo-Res". When You finish this, note that the image size will be 320 x 200. Farther down, click on the buttons TIFF-256, then FLC. You will now be ready to render the frames and compile them into a FLC anim.

You may make any number of sub-projects, using different screen sizes, color depths, trace mode, and so forth.

The various buttons below the frame list are now active. Press Range and hit enter when the small requestor reading "First, Last, Step" with the numbers "1, 36, 1" appears. Next click the Generate button. You will be asked which palette method You wish to use. Among them are Generate All, Generate First, Use Previous and Specify File. Because palette generation for the PC version of Imagine can take a fair amount of time, use Generate First. This scene uses few colors, and a single palette is likely to do well enough for this test. In more complex scenes, Generate All would be needed.

Imagine will proceed to render each frame. Small pictures with few items will render quickly, when all the stills are done the frames remain highlighted. Now just click on the Make button near the bottom right of the screen, You will then be asked if You wish to delete the still files as the animation is created. Just click YES. After a few more moments, the animation will have been compiled. Use the Load button near the bottom left. After a moment, the Play Once and Play Loop buttons are un-ghosted. Click Play Loop.

Your First anim begins zipping by. Press the F keys to slow or speed it up. When You've seen enough, hit Esc.

You now have made a basic Imagine animation.

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## 1.68 SECTION 2 - Modeling and Detail Editor

45] Phong shading: side effects, By Gregory Denby.

Imagine uses a routine called "phong shading" to produce a smooth appearance for its objects. To use a metaphor, it is as if a flexible plastic sheet is stretched from the centers of faces across the bounding vertices. As a result, the effects of shading are limited by the size of the faces.

It is easy to see how this works using a simple example. Create two "goblets" in the detail editor with the following cross section. The capital X is the first point, and it is placed on the axis. The x's are points along the line, placed at grid intersections and snapped to grid to insure a regular surface



```

x_x x_x
||||
|| x x
|| "view" || "view"
||||
|| x |
X__x| | X__x|x
x__x x__x|x
||
|x
||
||
||
x x
\x__x \x__x
x__|x x__x|x

```

Perform Function/Mold/Sweep 36 sections on each cross-section.

Click the "A" on the Perspective window bar, rotate the view so that You can look into the goblets. Now Quickrender.

In the resulting image, notice the difference in shading on the surface marked "view" in the diagram. On the simpler goblet, the "view" surface does not appear flat but rounded like a bell. This is a direct result of the phong routine shading all the way around to the bottom edge. In the more detailed goblet, the shading is limited to the smaller areas defined.

Try other variations. Select the intermediate points on the more complex goblet and move them up or down towards the rim or bottom. Note how the resulting renders will have tighter or looser shading. Or, create a goblet whose cross section comes to a point at both the rim and base. Despite being knife sharp, phong shading inappropriately rounds these.

Further complications arise when specularity is added. The specular highlight makes a bright "hump" whose focus can be sharpened by increasing the hardness parameter. Use the goblets created above to inspect this.

Enter the attribute requestor for each goblet. Make both a 123, 123, 123 grey color. Make specularity also 123, 123, 123, and nudge the hardness up a bit to 24. In resulting renders, the highlights produced will also be either limited or spread out across the defined faces.

In many cases, one will need to balance the positive and negative results of phong shading and specularity, especially if objects will be used in animations. If objects are kept simple, with few areas of small facets, shading may be "pillowy," but highlights will spread more smoothly across them. The forms of other more detailed objects will be more accurate, but irregular glints and crinkles will appear if they have much specularity. Therefore, the overall appearance may be better when either the polygons are fewer, but the specularity is increased, or there are many tiny facets, but little specularity.

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## 1.69 SECTION 2 - Modeling and Detail Editor

46] Lighting oddities, By Gregory Denby.

### Darkons

In a scanline render, shaped lights may have a negative intensity. This effect has been dubbed "darkons". For example, if a rectangular light with RGB values of -255, -255, 0 is pointed at an area also lit by a 255, 255, 255 light, the viewer will perceive only blue at that area. Although clumsy to use, darkons can simulate round and rectangular shadows in scanline renders. One might place a parallel "darkon" light under a chair, for instance, to subtract the light otherwise present to fake a shadow (negative lights may be defined only via detail editor).

### Colored Haloes

Diminish intensity lights shine with an absolute brightness for the number of units assigned in their intensity requester. Because the light is divided into red, green, and blue components, uneven use of these colors can produce "haloes". An instance of this would be a 255, 200, 64 light. If placed near a surface, the first 64 units from the axis would be white, the next 64 a brilliant orange, and the next 128 a pinkish orange. The light would then fade away as a pale orange, shading with distance to a darker and darker red.

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## 1.70 SECTION 2 - Modeling and Detail Editor

47] Lighting strategies for Imagine, By Gregory Denby.

The program's light simulation only slightly resembles that found in nature. The amount of light seen on a surface is controlled by the light's angle of incidence. The intensity of the light may fall off in inverse proportion to the distance, if you exclude an initial sphere of maximum intensity. However, the light is not reflected by surfaces, or scattered by an atmosphere. As a result, the generally diffuse appearance of light in every day experience is not directly available. Fortunately, there are a number of ways to approximate natural illumination.

The following techniques make an assumption common to usual methods of naturalistic representation. If an image is consistent in its construction, and does not obviously diverge from usual perceptions, the viewer will tend to assume the image is "real". A simple instance of this occurs in paintings.

Artist's colors did not achieve a full spectrum until near the beginning of the 20th century. And even after that, few artists ever work with more than a few hundred hues. Nevertheless, images whose range of colors generally fit ordinary experience are perceived as being "real", despite lacking the subtlety really existing. In like manner, the lighting methods presented here attempt to give approximations of genuine light that will give an semblance of reality.

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### Interior lighting

Handy tools. In most cases, the following will be used in concert to provide a simulation of interior lighting.

Shaped lights and soft edges

Controlled falloff

Ambient or unlocated light

Making luminaires

Bulbs

Shades

Filters

Additional effects, the other lite textures.

Lensflar FX and the Twinkle texture

Bright fog, linear fade and filter maps

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## 1.71 SECTION 2 - Modeling and Detail Editor

Focusing on small groups of objects, a basic arrangement.

A studio method used by photographers can be adapted for use within Imagine.

Although any effect may be used, few photographs are taken with a single bright flash. Usually, a main or "key" light is placed off to one side. This is usually fairly intense, and is used to bring out highlights on the subject. The down side of this is very dark, harsh shadows. A dimmer light, known as the "fill", is placed on the opposite side to lessen the severity of the shadows, and reveal the rest of the detail. Another light might be used to brighten any back drop so as to flatten out and contrast the principle subject.

Even the simplest adaptations of this set up can enhance Imagine quick renders.

The following assumes the render will be scanline and not trace. A point source with intensities less than 123 can be placed around 45 degrees to the left of the camera. If there is a backing plane, or a ground, the shading on this can be smoothed out by placing a 123 or less intensity parallel light a few units away from these surfaces, with the light's y axis pointing at them.

After placing an object at the origin, a "portrait" shot may be made with the quickrender light set 30 to 45 degrees off to the right.

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## 1.72 SECTION 2 - Modeling and Detail Editor

Adding complexity.

While the above provides a distinct improvement over the basic quickrender, the image still has a somewhat unreal look. There are no shadows. All the shading is very simple. The brightest surfaces in the scene are as bright as if they were lights themselves. There are quite a few ways to make the scene a bit more realistic.

The first step is to replace the quickrender light. While its Preferences setting of 255 intensity may be decreased and so avoid extremely bright surfaces, the quickrender light cannot cast shadows. Because it's a point source, the shading will not have the subtlety that real lights have because they're not point sources. A replacement light should then not be a single source. There should be several lights whose intensities sum less than 255 and which are separated by a five to ten degrees. At least one should be set to cast shadows.

TIP: Modifying shadow intensity

TIP: If one sets a light to cast shadows in Imagine, any area behind an object will be completely dark. There are two ways to lessen this effect. One may place other lights around the scene to fill in the shadow. There may be times when this is not desirable. If one wants light coming from only one direction, but wishes to lessen the shadow, create two lights at the same place. Both should be half the desired intensity, but only one should cast shadows. This way, the non shadowing light will pass right through any objects, and lessen the depth of the shadow.

Just as the key light was broken up, break the fill light into several lesser components. The fill lights should be more widely dispersed than the key lights. Instead of keeping a white or grey light, making all or some of the fill have a bit of color can help to suggest that it's being reflected from elements in the environment. Making them have "diminishing intensity" will increase the sense of direction as shading drops off more rapidly under their influence.

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## 1.73 SECTION 2 - Modeling and Detail Editor

Diminished Light.

Real world lights fall off in brilliance with distance. Imagine lights must be told to do this by choosing the "diminishing intensity" switch in the light requester. This fall off is not exactly continuous. There is a central area of unchanging maximum brightness. An even 255 light will shine undiminished for the first 255 units from its center. In like manner, a 64 light will be just as bright for the first 64 units of its spread. If the RGB intensities are uneven, a circle of white light will result, as well as an intermediate band of color. Therefore, one may prefer to use diminished intensity lights when they can be placed beyond their radius of total illumination.

There are some other side effects from using diminished lights. The penumbra formed by the indispensable Soft Edge texture will be lessened within the zone of maximum brightness. Also, specular highlights on objects will be duller when the diminished light is at a distance.

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## 1.74 SECTION 2 - Modeling and Detail Editor

Darkons

In some cases, scanline "darkons" can be used to fake shadows. Placing a parallel shaped light with the Soft Edge lite texture behind an object can produce a fuzzy darkened area somewhat like shadows in a scene with complex ambient light. This is available in scanline renders.

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## 1.75 SECTION 2 - Modeling and Detail Editor

Lighting a world

The reflection and fluorescence caused by sunlight in a daylight scene effectively makes every object a light source. One may use a manageable number of lights if the scene is broken into a number of principle regions. First, there is the disk of the sun. Then there is a pool of extreme brilliance around the sun caused by the scattering effects of the atmosphere. Next there is bluish light from the air, which can be as bright as 20 per cent of the sun light. The horizon can be considered as the accumulation of all light scattered by the lower atmosphere and objects projecting up from the ground. The ground itself colors and returns a large percentage of incident light. This grouping yields five different kinds of lights.

Consider building a world light set in the following manner. Place an axis at the world origin. This will be used as the parent of a group. Give it an appropriate name, such as "center" or "focus". To facilitate placement, make a sphere with a radius of 512 units, 36 circle sections and 18 vertical section.

The following light axes will be placed around the edge of this. All lights will be grouped to the center. Depending on the size of the world to be illuminated, this group can simply be scaled up or down.

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## 1.76 SECTION 2 - Modeling and Detail Editor

The sun.

Create an axis, name it "sun", place it 60 degrees up from the horizon at the edge of the guide sphere. Next, create four yellowish parallel lights of low intensity, around 20, 19, 16. Set them to cast shadows. Place them around the sun just a few degrees away. Aim one directly at the center, the others aligned parallel to the first. Group these to the sun, which in turn is grouped to the world center.

Sun's halo.

Make 4 to 6 slightly brighter, even colored point sources. Place these evenly within 15 to 20 degrees around the "sun" group. The total illumination of both the sun and the halo sources does not need to exceed 225. It may be desirable to make them somewhat less, so that any object with brightness turned all the way up will then appear to be a light. These may also be grouped to the sun.

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## 1.77 SECTION 2 - Modeling and Detail Editor

The sky light.

Create slightly bluish point sources and place them in the opposite hemisphere from the sun. Two or three thirty degrees apart from each other and no more than 22 units of intensity for the blue component will do.

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## 1.78 SECTION 2 - Modeling and Detail Editor

The horizon light.

Place these lights between 10 and 15 degrees up from the horizon. There should be at least six point sources. Depending on where the sun is in the sky, they will be more or less evenly spread around the perimeter. They should be fairly dim, no more than 25 intensity units. If there are more than six, the strength should be further decreased.

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## 1.79 SECTION 2 - Modeling and Detail Editor

The ground light

The last light source will represent the light reflected up from the ground. Create a very dim parallel light source. Place it directly below the world center. Usually this light would fade rapidly but in this example it will remain undiminished. This layout is intended to be general purpose and used with as little manual adjustment as possible.

Of course, the numbers listed above for the number of sources and their strength are just suggestions. Some "days" could use sun arrays that use the peak 255 illumination. A world light set with a large number of very dim sources would be useful for mimicking an overcast day. A few inactive axes could be added for those occasions when special lighting conditions are present. Each variation can be saved as a state. Note that morphing between world light states during an anim is likely to create very large files, since every pixel is likely to change as the lights alter.

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## 1.80 SECTION 2 - Modeling and Detail Editor

The principle behind the world layout.

As noted elsewhere, the basic Imagine light source does not dim with distance, but does fade depending on the angle of the incident light. Specifically, the light found on a surface is equal to the intensity of the projecting light multiplied by the sine of the incident light. What this means is that any face within 10 degrees of perpendicular will be very close to maximum intensity. The level of illumination will only gradually decrease, and at 60 degrees, there will still be half the light. From there, the brilliance fades rapidly and drops almost as much in the last 5 degrees as in the first 25.

When a principle light source is broken up into smaller units, their rays will form a broader bright area. Placing more dim lights around 60 degrees away will keep the shading from being too drastic. The addition of other small lights around the scene will simulate backscattered light. Because most of these lights do not cast shadows, their effect will be applied to all surfaces similar to the omnidirectional illumination from the atmosphere.

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## 1.81 SECTION 2 - Modeling and Detail Editor

### Interior lighting

Ordinary interior lighting is likely to be the most complex situation to mimic.

The various light actors may be incandescent or fluorescent fixtures, with any number of different shades or defusers. Natural light may also be present, more often as scattered light than direct rays of sunlight. Most rooms are small enough that the effect of light repeatedly reflecting from ceiling to floor to walls is readily noticeable. This sort of environment is best modelled by a method called "radiosity". Due to the huge computational expense of radiosity, Imagine does not support this. It's left to the user to contrive plausible approximations.

Remember that the final image is flat, and the depth cues provided by our vision is lacking. Because dispersed light tends to flatten out appearances, one may not want to approach the highly blended light present in contemporary interiors. Leaving in more shading and retaining the sense of depth is a good trade-off.

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## 1.82 SECTION 2 - Modeling and Detail Editor

### Shaped lights and soft edges

While shadow casting lights will be limited by any shape, it will be speedier to use the round or rectangular switches whenever possible. Fortunately, many luminaires project light in just these shapes. The addition of the softedge lite texture allows the edges of these shapes to be smudged in varying degrees.

The penumbra variable in the texture requester controls the amount of smudge. A setting of .1 starts the blurring at the percent of the lights radius, while a .9 shades only the lasty ten per cent. Therefore, a flood light can be made with a very large x and z axis, and a small penumbra setting. A spot light, conversely, will have a small axes, and a large penumbra value. A fluorescent panel provides very dispersed light, and so a rectangular light with extremely large x and z values coupled with the tiniest penumbra value can be used.

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## 1.83 SECTION 2 - Modeling and Detail Editor

### Controlled falloff

The more scattered light is, the more rapidly its effect will decrease. A globe light hung near a wall may produce 100 lumens at its own height, but as few as 20 near the floor. To achieve such rapid decreases in Imagine, one must use the Controlled Falloff option. With the exception of shaped point source lights, one needs only to adjust the length of the y axis to quickly set the lights range. If a conic or pyramidal beam is desired, the size of the axes needs to be set first to the desired proportions. Then all may be simultaneously scaled, so that the shape of the beam is not changed when the size of the y axis is altered to effect the brightness.

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## 1.84 SECTION 2 - Modeling and Detail Editor

### Ambient or unlocated light

Generally, the Global ambient light is of very limited use. Even a small amount of it will cause subtle shading to disappear. It is preferable to use a scattering of dim sources to feign this. In many cases, low intensity point sources can be placed both within and without a room. Be sure not to allow these to line up, because they will have a cumulative effect along the created axis. With careful adjustment, these small sources can lighten areas of rooms effected by brilliant directional rays, such as the shafts of sunlight coming through windows.

Sometimes aspects of ambient light are possible through the use of parallel lights. One may make rectangular parallel lights the shape of walls having a very short fall off distanceperhaps 2 or 3 units. Adjusted to an appropriate intensity, these may then be located just a unit away from a similar sized wall. In this manner, only a specific wall will be affected, and other walls in the view can have the amount of illumination correct for them.

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## 1.85 SECTION 2 - Modeling and Detail Editor

### Making luminaires

Observation shows that many fixtures have at least two levels of light coming from them. Primarily, there is the light allowed out by the shade, and then there is a second broader area formed by the light that has reflected of the interior of the shade. Therefore, at least two sources must be used to reproduce this.

Essentially, one needs to create two points almost at the same place with their y axes oriented in the same direction. Depending on the shape of the fixture into which they will be set, these will be either round or rectangular shapes.

Then one simply needs to size the axes to control the shape and fall off of the lights. The softedge texture should be added to each. As with the world light discussed above, any number of variations may be made on this and saved as states. A group with one yellowish 45 degree spread light surrounded by an 85 degree spread with very broad penumbrae could be called a "flood" light. A different state with 15 and 20 degree spreads of near white light with only a tiny fuzz at the edge would make a passable "spot" light.

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## 1.86 SECTION 2 - Modeling and Detail Editor

### Bulbs

Burning bulbs may be represented in several ways. Most simply, turn on the surface brightness. However, if the light emitting axis is inside the bulb, any shadow casting light will be trapped within during a trace. Setting the fog length to something small like .01 will then allow the light out while also flattening the bulb's silhouette. If You wish to fake the glare of light visible when looking at a bulb, You may wish to move the axis just outside the bulb. Then color the bulb a pale grey and turn specularly all the way up. This will make a maximum intensity glint which shades rapidly off towards the bulb's sides.

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## 1.87 SECTION 2 - Modeling and Detail Editor

### Shades

Imagine's facets are "one sided". This means that only one set of attributes may be "painted" on any given face. Therefore, two different objects must be made for a lamp shade that has a bright reflective substance on the inside and a matte finish on the outside.

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## 1.88 SECTION 2 - Modeling and Detail Editor

### Filters

In trace mode, surfaces may be assigned glasslike transparency. This can be done either through increasing the filter attribute or placing a grey scale brush on the surface and selecting the filter map option. If the filter attribute is modified for a concave or convex lens form, the light's direction will not be changed as would happen in reality. Also, color attributes are not changed. The curve of the surface will shade the light, however. Brushes may be used to cut out portions of the illumination, ala "bat-signal". One might make a black and white movie projector with a series of stills mapped to a filter in front of a parallel beam source.

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## 1.89 SECTION 2 - Modeling and Detail Editor

Additional effects, the other lite textures.

While the softedge is almost always desirable, the other textures will only have use in specific scenes. Frnchwin can be used to break a rectangular light into "panes," and Venlite will nicely reproduce the strips from light passed through slits. Strobe simply flashes the light off and on during an animation.

PC users have Caustics which can be used to produce random and chaotic banding in light, and Purphaze, which makes the chaotic banding occur in random colors.

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## 1.90 SECTION 2 - Modeling and Detail Editor

### Lensflar FX and the Twinkle texture

Lensflare is probably the best thing to come along in computer graphics since the chrome sphere. This effect happens most noticeably only when very bright lights are viewed. In many cases the flare effect is negligible and most lighting designers

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actively try to prevent it. Likewise, most photographers avoid it when possible. However, it can be used in long focus camera shots to accentuate depth, or to add an attention getting flash in any scene.

A complete description of these is more proper to discussions of Special FX, Textures, and Brushes. One may use either the global Lensflar special effect or apply the Twinkle texture to specific objects that will track to the camera.

As of version 4, this effect is not among the strongest in Imagine's bag of tricks. Consider using either a paint program or image processor to produce more striking flare brushes.

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## 1.91 SECTION 2 - Modeling and Detail Editor

Bright fog, linear fade and filter maps

A complete description of these is more proper to discussions of Attributes, Textures, and Brushes. Here, note that shafts and glows of lights can be simulated with bright fog objects. For example, a long tapered cylinder colored pale yellow or blue with a fog depth several times greater than its width and made bright can be used as a car's headlight beam. This can be attenuated through either the linear texture used in its filter mode, or with a grey spread brush used as a filter.

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## 1.92 SECTION 3 - Forms Editor

1] I was working in the forms editor on an object, and loaded it into the detail editor for modification. However, I can't seem to be able to get it back into the forms editor! Help!

Simply put, you cannot load objects saved from the detail editor back into the forms editor.

The reason is the forms editor requires a specified object structure which the detail does not. Thus, saving an object in the detail editor loses that information.

When you work with the forms editor is recommended that you keep a spare copy of the FORMS OBJECT saved separately from any detail object. In this way you can then go back and make modifications in the forms editor.

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## 1.93 SECTION 3 - Forms Editor

2] Forms Editor: getting started, By David Alan Steiger.

I love Imagine's Forms Editor. I think it's one of its best features. I must admit I didn't really get into it until a year ago, but now most of my good objects are at least partly based in the forms editor. I built an animatable human figure for a game I am involved with, composed entirely of form objects.

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To me it's a more intuitive way of creating objects. I have worked with sculpting clay, and making objects feels similar to what I have been taught. Now I don't know what I would do without the Forms Editor!

Here are some tips for beginners.

1. Don't expect precision.

The Forms Editor isn't made for exact, mechanical objects. You can make them, but expect to do a lot of vertex tweeking.

Its great for torsos, drumsticks (both kinds) muscles, and rounded objects like chicklets, old refrigerators, or safes.

2. Top view is a little different from Front & Right.

The default section type, "X-Y cross section" causes the Top view to work somewhat differently than the Front and Right views. "Y-Z cross section" does the same for the Right view. I'll keep my talk to the default X-Y.

Each pair of points in the Front or Right view correspond to a ring (cross-section) in the shape of the Top view shape. The width between these two points in the Front view define the cross-section's X-size. The width between these two points in the Right view define the cross-section's Y-size. The Top view shape will be squashed and stretched to fit these sizes. The points of each view also define the angle of the cross section.

The Front and Right views alone define the max width, height, and depth of the object. So what does the Top view do?

The Top view shape's effect is relative. If You scale X and Y simultaneously, nothing will change. Only the position differences between its vertices make a difference.

3. The most important point with the Top view is the fact that You may have multiple cross-section shapes.

This allows You to create a whole sword out of one form. Circular cross-section hilt. Square T-bar. Thin diamond-shaped blade. And Imagine will morph between two defined cross-sections.

4. At first, keep angles gentle.

Usually, severe jagged edges, peaks, or troughs only work well if or it's done in the Top view, or some sort of symmetry is active.

I have many forms that break this rule, but following it will keep You from frustration while You learn.

5. At first, keep Front and Right points at roughly the same height.

Note that when You drag a point in the Front or Right views, You get feedback as to where its partner point and the other view's partner points are. This is important. A lot of my first screwups were because of overlap problems.

This isn't to say You must follow this rule, many of my better forms don't. But You have to be careful not to get overlapping mess-ups.

6. Rotate that perspective view!

A lot of forms errors can be hidden behind (or worse, inside) an otherwise nice form.

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## 1.94 SECTION 4 - Cycle Editor

1] I made this really great animation sequence in the cycle editor, but when I set it up in the stage/action editors, the motion of the overall object isn't there!

When using the cycle editor, Imagine only remembers changes in size, position, and so on in relation to the main parent. Thus, if you make a change to the parent object, it gets forgotten. What this means is if you make a nifty robot jumping cycle, and make it in the cycle editor so the robot actually move up etc... all that will be remembered is the changes to the legs, arms and anything OFF of the PARENT. The overall rotations and movements to the main object will be gone.

Two solutions exist. One is to simply make those changes in the stage editor each time you need to. The second is to group a plain axis before you start to your object. (ie: Make the parent have a Null link). Then, you can rotate everything by rotating the main child grouped right under this null axis. This way you aren't moving the "parent", and everything will be remembered.

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## 1.95 SECTION 5 - Spline Editor

1] I tried to import a Postscript font but I got a "Vector not found" error. What does this mean?

There are a couple of different formats of Postscript files. If Imagine doesn't like one, it will pop up this or other errors. In that case you will either have to use another Postscript file, or find a software package that will convert it from that format to one Imagine will load.

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## 1.96 SECTION 6 - Animation, Stage Editor and Action Editor

1] Even though I move an Object/Camera/Light to a new POSITION/ALIGNMENT/SIZE in the STAGE editor, Imagine seems to 'forget' what I did!

All objects must have timelines split wherever there is a change in position, alignment or size. If you do not set this up, Imagine will forget the changes no matter what.

Rather than going back and forth to the ACTION editor and adding timelines, you can have Imagine automatically create the timelines properly so everything tweens as normal. There are the "Position Bar", "Alignment Bar" and "Size Bar" commands under the OBJECT menu in the STAGE editor.

So, if you have just gone to a frame and are making a new POSITION, ALIGNMENT or SIZE for an object (or camera or light) to tween to, press RIGHT AMIGA and 7/8/9 respectively. Or use the respective bar commands from the OBJECT menu. This will extend or put a 'split' in the timeline for you (you can check this in the ACTION editor). Also, don't forget to "Save Changes" if you want to keep the motion!

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## 1.97 SECTION 6 - Animation, Stage Editor and Action Editor

2] How do I use the Grow Effect?

To use the grow effect, create an object in the DETAIL editor that you wish to have 'extrude' over time. Create a spline path as normal in the detail editor. This will be the path the object extrudes along during the animation.

GROUP (not join) the object with the PATH AS THE PARENT. If you do not make the path the parent, it will not work. To do this, select the path, then hold shift and select the object, then select group. Save your GROUP for loading in the animation.

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Finally, add the effect in the ACTION editor for the grouped object.

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## 1.98 SECTION 6 - Animation, Stage Editor and Action Editor

3] How do I use the Tumble Effect?

The tumble effect is used to tumble 1 or more objects during an animation. To tumble an object, create your object or objects in the DETAIL editor. Still in the detail editor add an axis.

Group (not join) the AXIS to all the objects you want to tumble with the AXIS AS THE PARENT. Then load the GROUP into the STAGE/ACTION editor and add the effect as normal.

NOTE: The reason for the null object (axis) as parent is that Imagine does not TUMBLE the PARENT, just the children.

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## 1.99 SECTION 6 - Animation, Stage Editor and Action Editor

4] How do you get something to roll (at the right speed!) while following a path?

Getting an object to spin (like a plane doing a barrel roll) is easy- you align to path, then set Y rotation to be from 0 to 360 and it will do a complete spin. This is not in the right direction for a rolling ball, though. [Annoying feature- you can't say from 0 to 720 for two spins, or 0 to 3600 for ten.] To get it to roll I created a second path, which was basically a larger copy of the first, so the first path was just inside of the second path. I had an axis (a track) follow this new, outside path, then used "align to object" to make the sphere point to the axis.

Thus, as the ball moved along its path, one end (the positive Y axis direction) was always pointed at right angles to the direction of motion. Is this clear? Now using the "initial Y angle" and "final Y angle" I set them to 0 and 360 and it rotated as it rolled. As a special effect, I raised the "track path" a little in the Z direction so the sphere looks a little bit like a top rolling around, since the spin axis was not horizontal anymore.

An alternative would be to make a cycle object, rolling around the X axis. This is equally valid, but I did it this way first.

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## 1.100 SECTION 6 - Animation, Stage Editor and Action Editor

5] When I move a tracked Camera in the STAGE editor, it doesn't realign and draw the Perspective view correctly!

If you have Imagine 2.0 or higher, press RIGHT AMIGA and the K key together, or select "Camera (Re)track " from the OBJECT menu. This will make the camera repoint to the track from the new position and will redraw the perspective view.

If you have an older version of Imagine (or if you just want to) you can press RIGHT AMIGA and the C key or select "Goto" from the FRAME menu. Go to the current frame you are already on which will cause imagine to redraw everything.

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## 1.101 SECTION 6 - Animation, Stage Editor and Action Editor

6] I have found that after creating a scene in the Stage editor, and then deciding that I want an animation and adjusting the highest frame count, my scene gets mangled in the first frame. Why?

Well, it seems to me that this will happen if you don't split your channel bar from the first frame (where you want stuff to be exactly) to the second frame. I usually setup my scenes so that I have the first frame all set as it should be and then I do my transformation from frames 2-whatever. In this way, the first frame is ALWAYS where it's suppose to be no matter what changes I make in the remaining animation. If you look at your channel it should have a break between frames 1 and 2 and then be continuous (if that's the way your animation works out) from 2 on.

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## 1.102 SECTION 6 - Animation, Stage Editor and Action Editor

7] How do I use the Sway Effect?

Sway is used to make several objects oscillate back and forth on their own axis. You can use it to create underwater grass, or an army of those obnoxious red liquid-filled glass birds!

Just create all the objects you want to animate, then group them to a parent axis, load the group in the Stage editor, then add the Sway FX bar in the Action editor. Sway will make all children of a parent object oscillate; the parent is unaffected. The key is in the grouping: using Sway on a single object will do nothing, since the parent is never affected and in this case, there would be no children to affect.

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## 1.103 SECTION 6 - Animation, Stage Editor and Action Editor

8] Depth of field, By George de Beaumont.

I've spent a fair amount of time investigating Imagine's Depth of Field feature and thought I'd share my findings. The following text is long winded, excessively formal and has not been reviewed for errors. Still, You may find something of use. If not, don't hesitate to delete...

Depth of Field - Overview:

According to the addendum text file accompanying Imagine 3.0, the Depth of Field (DOF) feature was added late in development and is therefore not covered in the manual. While the supplemental DOF text file is brimming with potentially useful information,

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it has not been prepared with the average end user in mind. Compounding this problem is a less than intuitive DOF interface (DOF and 3D stereo imaging share the same parameters and requester box). The result is an exceptionally high learning curve. The goal of this text is to strip away the noise associated with the mixed function interface and provide a practical explanation of the Depth of Field feature.

Depth of Field - Useful Photographic Concepts:

Imagine 3.0 simulates many of the real world relationships associated with photography/video graphy. These include:

Focal point:

It is the point of perfect focus. Objects nearer or farther tend to be blurred, although an acceptable field of focus extends for some distance on the near and far sides of this plane.

Depth of field (DOF):

The Depth of Field is the range of distances from the camera over which focus is considered adequately sharp.

Field of view (FOV):

FOV is the width of the camera viewing area (usually expressed in degrees). FOV depends on the lens focal length.

Focal length:

This is the distance behind the lens (usually expressed in millimeters) where the image will be in sharp focus. The focal length also provides an indication of the FOV the user can expect from a camera system. The terms FOV and focal length are used interchangeably in this text. Common focal lengths and their associated FOV are given below.

focal fov lens

length (degrees) type

(mm)

17 180 fisheye

20 94 wide angle

28 75 wide angle

50 46 standard

55 43 standard

100 24 intermediate telephoto

135 18 intermediate telephoto

200 12 long telephoto

500 5 long telephoto

Aperture:

The aperture of a lens is the opening through which light is admitted. In photography/videography is desirable to be able to adjust the amount of light passing through the lens. This is accomplished via a variable diaphragm. A wide aperture lets in more light but at the expense of a greatly reduced DOF.

The effect of focal length, aperture size and focal point on DOF:

It is the interaction of the focal length, aperture size and focal point which determine the DOF for a specific situation. In general:

- a) Shorter focal lengths provide increased DOF;
- b) Narrower apertures provide increased DOF;
- c) Focal points farther from the camera provide increased

DOF.

Depth of Field - Imagine's Photographic Counterparts:

Imagine's DOF, FOV (or focal length) and aperture controls are intimately associated with the camera's X and Y sizes.

**FOV:**

We have all adjusted the camera view interactively via the angle (A), zoom (Z) and perspective (P) controls associated with the perspective view in the Stage editor. What follows is a description of how Imagine numerically handles some of this information.

The camera's FOV depends on the RATIO of the camera X and Y sizes. These values can be examined via the Transformation requester (Stage editor) or Camera size timeline (Action editor). The important thing to remember, is that a particular X or Y size does not determine FOV, but the ratio of X/Y (X divided by Y) does. There are MANY X and Y values that will yield the SAME X/Y ratio (and therefore the same FOV). See the following examples:

X Y X/Y FOV

(degrees)

100 320 .31 18

200 640 .31 18

100 200 .5 55

320 640 .5 55

Changing the FOV numerically:

As the X/Y ratio changes, so does the FOV. If You decrease X or increase Y (make the ratio smaller) You will zoom in (narrow the FOV). If You increase X or decrease Y (make ratio larger) You will zoom out (widen the FOV). When modeling real life situations, the following may be used as a guide for setting Imagine's FOV numerically.

focal fov X/Y example

length (degrees) ratio X/Y

(mm)

20 94 2.19 1400/640

28 75 0.68 435/640

55 43 0.50 320/640

100 24 0.43 277/640

135 18 0.31 200/640

200 12 0.22 143/640

500 5 0.04 28/640

An examination of the FOV and X/Y ratio values show that they do not change proportionally (i.e. doubling the ratio does not double the FOV). The relationship is logarithmic. That is, making a wide FOV wider requires a much greater change in the X/Y ratio.

Be aware that wide FOVs produce considerable distortion, especially at the edges (certain portions of the image will appear disproportionately large).

**Focal point:**

Imagine's focal point is associated with the camera Y axis (the camera view points in the direction of the Y axis). Until the DOF feature is activated (in the Action editor), all objects will be in perfect focus (infinite DOF) and a specific camera Y size is not important. When the DOF function is activated the camera Y size will have a dual role (we already know that the camera size X/Y ratio affects FOV). When DOF is activated, the camera Y size will also specify the distance from the camera which is the point of perfect focus (FOCAL POINT).

**Depth of field:**

In a real camera, it is the interaction of the lens focal length, aperture size and the point of focus that determines the DOF. In Imagine, the DOF can be configured in several ways. It can be set to a specific numerical value independent of the aperture size or FOV (or focal length). If desired, the DOF can be tied to an apparent aperture size and FOV to allow the simulation of camera optics.

**Aperture:**



Imagine 3.0 has only a limited notion of aperture size. Imagine uses an apparent aperture size to influence the DOF. This aperture size does not in any way affect the amount of light reaching Imagine's virtual camera. Lighting changes must be done by altering the intensity of ambient lighting or the individual light sources.

Depth of Field - Overview of the DOF/3DS requester:

To activate the depth of field function, You must go to the Action editor and add an Actor bar to the camera timeline. This will open up a the 3D Stereo/Depth of Field Requester box. The following check/data entry boxes deal with the 3D Stereo image features and can be IGNORED when adding simple depth of field to Your project:

Y Size is (3DS) Screen Distance (check box)

Distance Multiplier (data entry box)

Eye Separation (3DS) (data entry box)

Eye Sep is Screen Width Multiplier (check box)

Eye Sep is Actual Size at Scrn Dist (check box)

The check/data entry boxes that pertain directly to DOF are:

Y size is DOF focus distance (check box)

Aperture size (DOF) (data entry box)

Ap. size is DOF width multiplier (check box)

Ap. size is actual size (check box)

Depth of Field - Activating DOF feature:

Check the "Y size is DOF focus distance" box to activate the DOF feature.

Depth of Field - Choosing static or dynamic DOF:

Next, check one of the two following boxes:

Ap. size is DOF width multiplier (static DOF)

Ap. size is actual size (dynamic DOF)

Which one You check will depend on whether or not You need to animate the DOF effect. For example, You may want to animate the DOF effect to simulate the optics of a real video camera. If You were to focus a video camera on an object (at some intermediate distance) and then zoom in (close-up), You would observe that the background would progressively become out of focus.

Depth of Field - Configuring the Aperture Size (DOF) data entry box:

Imagine will interpret the value that You enter into the "Aperture Size (DOF)" box differently, depending on whether You chose the static or dynamic version of the DOF feature.

Static DOF ("Ap. size is DOF width multiplier" box checked):

This DOF option is static in the sense that changes in the FOV (X/Y ratio) do not alter the DOF. The value You enter in the "Aperture Size (DOF) box" will be multiplied by the pixel width of the image (set in the Project editor). The product of which will be the maximum defocusing that will occur for objects in the distant background (in pixels). Larger values result in a narrower DOF and greater defocusing of distant objects. In lieu of using the following equation, entering a small number (0.01) will usually provide an acceptable starting value.

The equation for determining the Aperture Size (DOF) box value:

$$A = D/W$$

where:

A = Aperture Size (DOF) value

D = Desired maximum defocusing (in pixels)

W = Image width (in pixels)

---

Example: if You wanted the maximum defocusing to be 6.4 pixels  
(at distant background) divide 6.4 by the image width (set in  
the Project editor):

- 1)  $A = 6.4/640$
- 2)  $A = 0.01$

Dynamic DOF (Ap. size is actual size box checked):

When You choose this option, DOF becomes linked to the camera X size value (see the equation below). This DOF option is dynamic in the sense that as You change the FOV (X/Y ratio), the DOF also changes. The dynamic DOF option can be animated to simulate camera optics. Like the static DOF option, larger values result in a decreased DOF and increased defocusing of the distant background. In lieu of using the following equation, entering values in the range of 2 - 4 generally provide an acceptable starting point.

The equation for determining the Aperture Size (DOF) box value:

$$A = DX/W$$

where:

A = Aperture Size (DOF) value

D = Desired maximum defocusing (in pixels)

W = Image width (in pixels)

X = Camera X size

Example: You want a maximum defocusing of distant objects to be  
6.4 pixels. You have set the camera FOV. The camera X/Y ratio  
is 320/640. The image width (Project editor) is 640 pixels.

- 1)  $A = (6.4 \times 320)/640$
- 2)  $A = 3.2$

Depth of Field - Setting Point of Focus:

As previously mentioned, once the DOF function is activated, the camera Y size determines the focal point. The trick is to vary the Y size (change point of focus) while keeping the desired focal length (FOV). This is accomplished by first activating the camera line function (Stage editor/Display menu). Next scale the camera, using the Y bounding line (Top view) as the guide for determining the point of focus. As long as the X and Y axis are scaled proportionally, the focal length (FOV) will remain the same.

Depth of Field - Summary:

This text provides the basics for implementing the Imagine 3.0 Depth of Field feature. Use of 3D stereo imagining (LCD shutter glasses) with Depth of Field has not been covered. These instructions should provide a sufficient basis for understanding the Impulse supplemental text.

While Impulse's implementation of Depth of Field is not particularly intuitive, it does offer lots of flexibility and artistic potential. For instance, You could progressively defocus one object while bringing another into sharp focus (thereby changing the viewer's point of attention) by transitioning between two equivalent X/Y camera size ratios. There are undoubtedly many other ways to use this feature creatively.

Be aware that the amount of defocusing adversely affects rendering time. Severe defocusing (narrow DOF) not only results in longer rendering times but also does not always yield photorealistic results.

Depth of Field - Corrections to DOF text:

In the text I listed focal lengths and their equivalent field of view. The values are specific to a 35mm SLR type camera system (which I did not mention). This may mislead some who may want to simulate other camera systems (video or still). Even though focal length and field of view are related concepts, I was not technically correct to use the terms interchangeably.

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## 1.104 SECTION 6 - Animation, Stage Editor and Action Editor

9] I'm having trouble creating a revolving light (ala emergency vehicle), I am making an animation of a room which has hanger-type doors opening and I want to make a warning light which flashes when the doors open, By Peter Borchers.

I finally got my revolving light figured out. For those who are interested here's how I did it.

In the detail editor I made a reflector object (colored black), and moved the axis to the bottom as a pivot point. I added an axis, which I made a light (point, round shape, R = 400, G = 0, B = 0).

```
// x <- light (x)
```

```
| reflector |
```

```
\\ (something like that...)
```

I grouped these two objects to enable them to revolve together. I made a glass cover, and a bulb (R = 255, G = 0, B = 0, set to Bright). In the action editor I added the Revolve effect to the reflector (revolve around Z axis) and then traced. In effect, the black reflector object revolves with the light around the bright bulb object, shining the light onto the walls of the room, and hiding parts of the bulb as it revolves, creating a realistic (at least I think so) warning light.

I haven't added lensflares yet, as Imagine's lensflare effect adds multiple flares, instead of just one when the light is shining directly at the camera. I'll probably use Image Master (Amiga) or Win Images (PC) to add flares.

Not really a detailed description, but it should at least give You an idea how I achieved the effect. I might post a jpeg to show You what it looks like.

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## 1.105 SECTION 6 - Animation, Stage Editor and Action Editor

10] Inertia effect: overshoot, By Charles Blaquiere and Milan Polle.

I just discovered that Imagine already has a built in inertia effect! I was using the Spline Interpolation with a starting speed of 5 and an ending speed of 0. The speed of 5 turned out to be too fast, so the anim extrapolated and returned to the target position. A really neat cartoony inertia effect... wow! It's not a bug, it's a feature :)

Yep, and You can also obtain this effect (called overshoot) by setting the Spline #1 parameter, in an Action editor bar, to a negative value such as -1. Setting Spline #0 to -1 would produce the opposite effect, anticipation of a motion (imagine someone's arm pulling back a bit before they throw a punch).

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## 1.106 SECTION 7 - Rendering and the Project Editor

1] Why do objects render fine in Scanline, but disappear in Trace?

There are 2 possible causes for this.

- 1) You are running out of RAM
  - 2) You objects are outside of the World Boundary
-

To check #1 (for the Amiga), pull down The Project editor after you start a render during the initial ization phase. Click once on the Workbench backdrop and you should see how much RAM you have on the top of the screen. As Imagine starts to render, this will decrease. If it becomes close to 0, chances are, that's your problem. To solve that, buy more RAM.

The other possibility is that the objects are outside of the world boundary. The world boundary is basically a box in which your objects are placed. When you enter the STAGE editor, you are placing objects in this "virtual box" whose center is 0,0,0.

When you Trace, Imagine clips ALL objects that fall outside of the box. The size of the world boundary is set in the ACTION editor. In this editor, there should be an item named GLOBALS. Whatever numbers are set in the SIZE timeline becomes the size of the box so that it lies from +/- Value for X,Y and Z. The default is no information present, which Imagine assumes is +/- 1024 units for all 3 coordinates.

Thus to fix this problem you can:

1) Scale your entire scene to fit inside the +/- 1024 size

boundary

2) Add a size line and set the X,Y,Z to the values you need

(This can be found by using "coordinates" in the STAGE editor and moving the cursor around to find the values)

3) Add a size line and set the X,Y,Z sizes to 0,0,0. This will

force Imagine to calculate the world size for ALL frames

based on where objects are for the FIRST frame. This is

important since if your objects move farther out during

subsequent frames, you will have to set the size manually

(see 2 above) since it will now be outside the computed

boundary, and thus clipped.

Note: The world boundary has no effect in Scanline rendering.

Note: Setting the World Size to 0,0,0 regardless of problems will

usually DECREASE Trace times!

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## 1.107 SECTION 7 - Rendering and the Project Editor

2] I have a problem with Filtered objects and the Global Backdrop!

For some reason, clear or glass like objects will not be clear when used with a backdrop. To get around this render with "genlock sky" and then use an image processing program t o composite the rendered image onto the background pic for each frame. Fog objects have a similar problem.

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## 1.108 SECTION 7 - Rendering and the Project Editor

3] I have created an animation (Hurrah!) and when I look at each of the individual frames, they look just as I thought they might. However, when I animate them, anywhere I have applied the "roughness" parameter, surfaces look animated...with lots of "crawling" effect on them. What gives?

Roughness should NOT be used on objects that will be animated. (Unless of course, the "crawley" effect is what you're after). This is caused by a bug in the roughness algorithm. One of the main work-arounds suggested, is by using a very small or fine bump-map. Another work-around is to create a DPaint (or for that matter ANY IFF) multi-gray shaded screen and apply it as an altitude map.

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## 1.109 SECTION 7 - Rendering and the Project Editor

4] What situations, parameters, attribute values, etc. require the most rendering time?

The list is long: reflections and refractions increase rendering time significantly, anti-aliasing (0 longest)-BTW this you must edit in the .config file and resolve depth (also in .config file), number of polygons, camera position (obliqueness), size of brush maps and even the numerical entries of solid textures, resolution, display and render modes etc etc.

The big ones are refraction, edge level(antialiasing, reflection (along with "depth") and # of polygons. Pretty well in that order too. Remember that a higher refraction index is longer rendering time also. And yes the scale of the object means a LOT. Imagine uses something called an \*Octree\* to calculate the scene. This is related to the world size setting which is also discussed here in article number 1 above. The difference can go from \*hours\* to minutes, so scale your scene by the size you make your world. You can select everything in the scene (including camera and lights) and scale it interactively.

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## 1.110 SECTION 7 - Rendering and the Project Editor

5] How do I get rid of the "Jaggies?"

The .config file for anti-aliasing defaults to 30. This is ok, but not great. The best is 0 and final rendering should always be 0. So you must edit this file every so often (before opening Im) or build a front end on the work bench (requires programming knowledge, though). BTW, the anti-aliasing is EDLE in .config file.

{for those unfamiliar with the term jaggies - they refer to the way lines drawn by computers tend to have a jagged or stair stepped appearance, instead of a smooth continuous line. This is usually found more in low resolution images.}

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## 1.111 SECTION 7 - Rendering and the Project Editor

6] How do I figure out the pixel aspect for a certain resolution display? I am rendering a picture to be displayed on a macII at 1024x768. Does anyone know the formula or is it device dependent?

Pixel aspect ratio depends both on the aspect ratio of the display device (your monitor) and the resolution that fits onto that screen. Most monitors use a 4 x 3 aspect ratio so that to achieve square 1:1 pixels, the resolution must also be 4:3. 1024 x 768 will achieve this as well as 640 x 480. The Amiga typically uses a non-square aspect ratio of about 1.2:1 such as 320 x 200, 640 x 400, 768 x 480, etc. So the pixel ratio can be found using...

(horiz res. / horiz display size) : (vert res. / vert display size)

If your monitor has a 4:3 aspect, you should have 1:1 pixels.

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## 1.112 SECTION 7 - Rendering and the Project Editor

7] When making a disco ball effect, will a SPHERICAL light set at 255 be bright enough to cause visible spots on the surfaces in a scene?

No, I bet that a light of 255 won't work too well. So crank it up to 2000! Lights are not limited to 255 (It is logical that lights can be as bright as they want). Values above 500 or so are pretty severe; they cast strong shadows, like a very sunny day. Above 3000 or so and it looks like you're world is lit by nuclear weapons.

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## 1.113 SECTION 7 - Rendering and the Project Editor

8] I have a Amiga 3000/25. How long should it take to do a full trace picture with perhaps one transparent (nearly) glass? Does 4.5 hours sound reasonable to you? I am running the floating Point version of Imagine.

The floating point version of Imagine uses inline floating point code for maximum speed. It does not use the libraries. I suspect that the non-FP version uses the libraries, just in case. You can probably SPEED UP your trace time SIGNIFICANTLY by scaling up the whole scene in the stage editor (see question 4 above!). A trace time of 4.5 hours on a 3000/25 definitely a "wee bit" on the high side for a scene as simple as you describe.

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## 1.114 SECTION 7 - Rendering and the Project Editor

9] Is there any particular format that Imagine prefers? Ham? 32 Color? EHB? 24 bit 1000 x 1000?

The best is a 24-bit image, of course. Anything works, but the color range of a 24-bit will beat the tar out of a 16 color any day. Exceptions would be objects with a few discrete colors, like a red, white, and blue flag. Then a 24-bit and a 4 color image are equal in quality. Note that Imagine converts them all to 24-bit internally, though- the memory goes down equally for a 100 by 100 4-color as it does for a 100 by 100 24-bit.

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## 1.115 SECTION 7 - Rendering and the Project Editor

10] I would like to use conical light sources with my rendering, is there anyway "see" in wireframe where the light will fall?

\*\* Note: In imagine 2.9, the ability to turn on 'Light Lines' was added in the Stage editor. The following describes another way to 'see' the light in the Stage editor before this feature was implemented. Of course you can still use this in 2.9 and above.

For conical lights, the X-axis size determines the radius of the light beam at the distance set at the Y-axis. This if a light has a X size of 50, and a Y-size of 200, the light would have a circle with the diameter of 100 units at a distance of 200 units from the light's axis itself.

You can use this information to create a conical light object in the detail editor. By creating a wireframe light, you can then load the light in and actually "see" and resize it to get an idea for the lights size.

Add a primitive cone object. Then position the axis of the cone such that it is at the exact tip of the cone object. Finally rotate and resize the cone's axis so the Y axis extends to the end of the cone and the x-axis (which should already be set okay) has the diameter of the cone.

The above can be done in 4 steps using the transformation requestor, make sure that the "transform axis only" box is checked in steps 2,3 and 4:

- 1] Add a primitive cone with default values.
- 2] Set the Position on the axis -100 on the Z-axis.
- 3] Set the axis alignment to -90 on the X-axis.
- 4] Set the axis size to X=50, Y=100, Z=50.

Front or side view of cone: Z--X

```

/\
/\
/\
/\
/\
/\
+----|-----+
Y

```

Once this is done you will now have a cone object with the axis set correctly to be a light. It is not yet however a light source. Go into the attributes requestor for the object and click on the box labeled "light". In here is a standard light box just like those in the action editor. Click on conical, and set the color and other options as you wish.

At this point you must remove any faces from the object. If you do not do this, when you render the object will will have a white cone. Simply go into "Pick Faces" mode and then "Select All" of the faces and finally "Delete" or "Cut" them. You will now have a wireframe cone light. Save this object.

From now on, you can load this as a normal object into you renderings and resize, scale and move the light around as you wish. The only drawback to this method is that to change light parameters such as color or shadows, you must re-edit the object in the detail editor and then resave it.

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## 1.116 SECTION 7 - Rendering and the Project Editor

11] How important is lighting for a rendering, and is there any "preset" method used to get good results?

Lighting in computer graphics is a very important element in creating images. It takes a while of exp erimenting with different types of lights and settings to get good results, but there is one basic setup that can also be used as a starting point.

The basic approach is one used for lighting real world video scenes. It is known as a "3 point" light setup since it involves 3 light sources.

The first light source named the "key" light is the main light for the scene. It is usually placed about 45 degress above and to the side of the camera. This provides overall light so you can see your objects etc...

The second light is known as the "back" or "top" light. Place this light above and slightly behind the center of your scene. In video this is used to show highlights on a persons hair so you can tell where the back of their head is. In this case, it provides a similar function so that you can see the back parts of objects. This is typically set at about 2 times the key lights intensity, though for computer graphics a setting equal to or less than that of the key is usually enough.

The final light is the "fill" light. This is usually placed at a 45 degress angle below and to the side of the camera so that it is on the opposite side of the "key" light. This light should be dim and possible colored and diffused to give some illumination to any part of the scene not covered fromt the other lights. F or rendering this means lowering the intensity and or making the light "diminish in intensity".

With this setup there should be an improvement over any rendering using just one light. As a test setup a ground and a stationary object. (The typical chrome ball with cool highl ights on a checkered ground works well here) Render once scene with just one light (the key light only). Then add the other 2 or more fill lights and re- render it. There should be a big difference.

Also, don't forget that lights can be colored, can cast shadows and can be "conical spotlights". All this can be used to give greater value to your scene.

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## 1.117 SECTION 7 - Rendering and the Project Editor

12] Help with Fog, By J. Koszarsky

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Fog isn't too bad once you get the hang of it. There are a couple problems to be aware of though. Overlapping fogs will cancel each other out wherever they overlap. Fog objects should be closed objects. If you have a tube be sure to close the ends up. And when you scale your object up or down you should be aware that the fog length will not scale with your object, I found this very annoying.

Imagine you have a 100x100x100 cube and you make it a fog object. What does the fog length mean? If you make your fog length 50 units and then move a non-fog object into the fog, once it goes beyond 50 units you won't be able to see it anymore. 50 units is the point at which an object inside the fog will be totally obscured by that fog. If you shorten the length to say 25 then the fog will become more dense. Making the length larger creates a less dense fog. If the length is greater than 100 then you will be able to see objects on the other side of the cube.

Using global fog in the Stage/Action editors is similar but it is applied everywhere, like an infinite plane. You can however control the heights(Z) where the fog begins & ends. So if you wanted fog in a graveyard you could tell it to start at the ground level and end as high as you want, depending upon what you are looking for in your scene. The fog length works the same as with objects. If it is set to 100 units then any object in your scene that is beyond 100 units will be hidden in the fog. For a very subtle fog I sometimes set my length to 2048 or greater, this is very thin.

There is another annoying feature of fogs. It looks great when used for making atmosphere on a planet but it will illuminate the entire planet, no matter where the light source is placed. So you can't get a dark side if you have the fog around the entire planet. You can get around this by using a half sphere fog for the atmosphere and aligning it to your lightsource.

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## 1.118 SECTION 7 - Rendering and the Project Editor

13] How can I render in Widescreen/Letterbox format?

Besides making for some neat looking animations, this will also lower rendering times. For a render that would normally be 768x482 or so, make it 768x380. Leave the ratio just as it is (6:7). Any where from 380-330 or so will look pretty good.

Remember though that Imagine will still show the entire normal view of the animation in the Stage editor's preview window. This means that while you can see objects at the top of the screen here, they might actually be cropped in the final rendering.

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## 1.119 SECTION 7 - Rendering and the Project Editor

14] I selected Spheres for my particle object, but all I get is a polygonal shape!

In order for you to get spheres in the particle object you will have to render in Ray Trace, not Scanline. Otherwise you end up with a faceted sphere of only a few polygons.

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## 1.120 SECTION 7 - Rendering and the Project Editor

15] Help with Fog: if you place a fog object inside another, they cancel out, why?

(By Ian Smith)

I was looking over an older list of bugs that were still not fixed when I came across the fog canceling out other fog objects. Remembering previous messages about transparent objects I wondered if it would work for fog. It does, sorta.

Imagine only renders flat, one sided triangles. To make a solid object, Imagine keeps track of if it is inside or outside of an imaginary solid. When a ray hits a face with fog or transparency, the ray is considered 'inside' until it hits another edge. That is why if you place a fog object inside another, they cancel out. When the ray hits the second fog object, Imagine considers the ray having exited the fog object. This is actually a good thing, albet tricky at times.

The solution to both problems as noted before on the list, is to make sure all objects are solid entities with no common or open edges. Picture trying to make a yellow sphere of fog with a second red fog sphere inside. If you try this, what happens is you get a sphere of yellow fog, but it has a hole in it where the red should have been. This is the canceling effect. What you do now is to set the inner sphere to the same attributes as the outer one. You now have created a true hollow fog object. The trick is to now use a third sphere, make it a red fog, and put it inside the hole. You have to be careful to make sure it is just a little smaller than the hole. Try to make it about 0.001 units smaller. An easy way is to duplicate the inner surface of the sphere and then scale it down slightly.

I included a uuencoded object you can test render (please refer to IMLarc61.lha at IML landfill for these uuencode objs). It contains 8 CSG spheres...

RIGHT.LARGE - Large yellow fog.

RIGHT.UPPER - Small yellow fog inside.

RIGHT.LOWER - Small red fog inside.

LEFT.LARGE - Large yellow fog.

LEFT.UPPER - Small yellow fog inside.

LEFT.LOWER - Small red fog inside.

LEFT.UPPER.OUTER - Inner surface of LEFT.LARGE surrounding LEFT.UPPER

LEFT.LOWER.OUTER - Inner surface of LEFT.LARGE surrounding LEFT.LOWER

When rendered, the object on the left renders correctly, showing a yellow fog sphere with a red splotch of fog in the bottom corner. The top yellow fog does not show up because it is the same color and density as the larger sphere.

The right sphere however, renders incorrectly. It shows a solid, shaded red sphere in the bottom, and at the top is a hole where the smaller yellow sphere should be.

Now Imagine is still not doing for quite correct. For one, this trick does not work for global fog! I tried surrounding a fog object with a shell that was the same density and color as the global fog, but it simply caused the fog object to vanish completely! I was hoping this would allow the use of fog objects with global fog, but no luck. Secondly, and more important, the above example with red fog inside is still not what should happen. The object on the right SHOULD render correctly. In reality, you do not chop holes in fog and stick other peices of fog inside. The two fogs should add their fog properties together. I have no idea what goes on inside Imagine, but I can take a guess that each ray has a fog/transparency flag that gets toggled when a ray hits a surface. What they need is not a flag, but an array of flags to keep track of how many layers of fog they have penetrated. Perhaps link this to the reflection resolve paramater in preferences. Then we could have true addi

tive fog. You can fake it by manually adding the attributes together and settign the inner fog object to that.

BTW, I tried a negative fog length and it resulted in a totally invisible object. I wasn't sure WHAT I expected, but figured it was worth a try. :-) I also ran these tests in Imagine 2.0 and 3.2 to test for diffrences. Other than 3.2 being about 25% slower to render than 2.0 they worked the same.

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## 1.121 SECTION 7 - Rendering and the Project Editor

16] The config file says something about "oct-tree level". What EXACTLY is this about?

The oct-tree stuff is an optimizing gig that Imagine does while ray tracing.

It sub divides the world up into cubic areas - the oct-tree level tells the renderer how much to keep sub dividing things (this is what's going on when Imagine says, "Initializing"). A high oct-tree level works great for most objects, but for very simple objects (like, just a single, simple primitive) the renderer over does the sub-dividing. A lower level number would be more effecient for the simpler objects.

The oct-tree area is directly connected to the global world size. Setting the global world size to 0, 0, 0 makes Imagine take it's best guess at a world size for the oct-tree.

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## 1.122 SECTION 8 - Essence Settings and Other Attributes

1] Electrical Arc (Essence)

Here's how to make an electrical arc between two rods, like something out of Frankenstien's la b.

1] Start with a plane with 255 R,G,B on Color and a light blue

(or whatever color you want the arc to be) in Filter.

2] Use Ringfract as follows:

Set the Z axis to point out of the plane, (rotate 90 on X)

Low Trans Start=30 Low Trans Width=5

Hi Trans Start =40 Hi Trans Width =5

Set the color to 0,0,0 for RGB.

Leave other settings at defaults

Place the axis of Ringfract in the middle of the bottom edge of the plane.

3] Now use Swapcrf to swap the color and filter values. Do this by setting all parameters to 0, and then setting the following values to 1:

Filt -> N Color = 1

Refl -> N Refl = 1

Color -> N Filt = 1

Now when rendered, there should be something similar to an electrical arc (or maybe some sort of plasma). To have the arc grow, rotate the Ringfract axis on X up or down so that the plane and cylinder do not intersect at 90 degrees. If you animate this it looks like the arc gets taller until the arc breaks (i.e. the plane no longer intersects Ringfract's cylinder in a curve, but instead in two lines).

Also setting the plane to bright will make it look correct in dim scenes.

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## 1.123 SECTION 8 - Essence Settings and Other Attributes

### 2] Veined Marble (Essence)

The veinedmarble texture is used twice, once for large, widely spaced veins. The second use is for finer, closely spaced veins. For veined green marble set the object color to 40,80,40 for Red Green and Blue respectively. The texture veins are a gray-green color.

Text#1 Text#2 Parameter Text#1 Text#2 Parameter

800.0 300.0 Initial Scale 4.0 5.0 Turbidity

7.0 7.0 # of Scales 0.9 0.98 Color Level

0.4 0.4 Scale Ratio 120.0 120.0 Color Red

0.6 0.6 Amp Ratio 150.0 150.0 Color Green

0.4 0.4 Time Ratio 120.0 120.0 Color Blue

0.0 0.0 Time 0.0 0.0 Fade 0..1

1.0 1.0 Sharpness 0.0 0.0

20.0 10.0 Vein Spacing 0.0 0.0

Rotate the second texture 45 degrees around the X and Y axes with respect to the first texture. You may want to rotate the first texture as well.

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## 1.124 SECTION 8 - Essence Settings and Other Attributes

### 3] Rough marble/rock (Essence)

This uses 2 textures, one for a main color variation, and the other for the bump/roughness. This is very effective for creating stone surfaces. Try these settings on a primitive plane.

Object Attribs R G B Value

Color = 136 118 128

Specular = 153 134 132

Dithering = 255

Phong = On

All others at 0.

Texture 1: fractalcolor Texture 2: bump

Parameter Value Parameter Value

Initial Scale 15 Initial Scale 5

# of scales 5 # of scales 4

Scale Ratio 0.4 Scale Ratio 0.5

Amplitude Ratio 0.4 Amplitude Ratio 0.5

Time Ratio 0.4 Alt. Adjust 3

Time 0 Fade 0..1 0

Base->1 Trans 0.3 Axis placement left at default

1->2 Trans 0.6

Color 1 End 1

Color 1 Red 70

Color 1 Green 60

Color 1 Blue 60

Color 2 Red 255

Color 2 Green 240

Color 2 Blue 240

Fade 0..1 0

Axis placement left at default

When rendered an off gray stone will be created. Great for caverns, dungeons and so on. Just slap it onto the walls or columns to give it good-ol' natural look.

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## 1.125 SECTION 8 - Essence Settings and Other Attributes

4] Soap Bubble (Imagine 2.0 and higher)

COLOR REFLECT FILTER SPECULAR

R 250 10 192 255

G 215 10 162 245

B 225 10 133 238

Dithering Hardness Roughness Shiniess Index of refraction

0 245 (Or less) 0 0 1.08

Then Add a Pastella Texture with the following data in each column:

102.333374 100.00

0.0 0.0

255.0 255

0.0 180

100.0 80

0.0 110

255.0 0.0

100.0 0.0

Now, try render it, and remember to put a object behind, and try to make several copies, and make a complete bubble bath!

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## 1.126 SECTION 8 - Essence Settings and Other Attributes

5] Spaceship Panels (Imagine 2.9 and higher)

This uses the RADWIND, TUBEWIND, or RECTWIND textures to create multicolored spaceship panels :

- Add a primitive sphere with it's default values.
- Apply the RADWIND texture (or other 2 textures depending on the shape of your object)
- Make these adjustments to the texture variables:

Column One Two

-----

1 210 \*These params will give you panels that  
 3 210 are randomly colored from the two color ranges  
 60 210 defined in column two.  
 0 190 \*Play around with some of the variables to get  
 1 190 the effect right for you.  
 0 190  
 0 -1  
 0 0

-----

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## 1.127 SECTION 8 - Essence Settings and Other Attributes

6] Bark, mountain, stone effects (Imagine 2.9 and higher)

This uses the WRINKLE texture.

- Add default cylinder and CLOSE the TOP
- Select the top edges of the cylinder and MAKE SHARP
- Apply the WRINKLE texture and render.

This will look like bark around the cylinder....play with the noise functions to adjust the look of the bark.

Now make these changes to the Texture:

Column One Two

-----

0.5 150 \* This will look like the sides of a mountain  
 0.5 150 around the Cylinder. On the top of the  
 10.0 150 cylinder it will look like granite.  
 1.0 20 \* When applied to organic objects the vertical

0.5 50 faces will have the rivulets, the horizontal  
0.0 20 faces will be granite-like.  
0.0 0 \* Try changing the first three variables in  
1.0 0 Column one to 10,10,1 respectively. The  
resulting look will make the cylinder look  
like a core sample around the cylinder, while  
the top of the cylinder will have a marble  
like quality.

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## 1.128 SECTION 8 - Essence Settings and Other Attributes

7] Solar Corona, By Cyrus J.Kalbrener (Essence)

This uses 1 sphere, 3 disks and 2 Essence textures.

- First use varyabsrgb to create changes subtle changes on the suns surface between white hot and light yellow.
- Then use a disk for the corona, rotate the object axis so that the y axis was perpendicular to the surface of the disk and add the cylindturb texture with the z axis extending perpendicular from the surface of the disk. We used cylindturb because we could translate the texture along it's z axis to create the illusion of movement much more effectively than radiaiturb.
- Then add another disk and place it less than 1 unit behind the first, apply the radial Impulse texture to create the glare around the sun.
- Now apply radial to another disk, this time making it black to blot out the stars behind the corona that would show through the glare (it looks pretty unrealistic without it).
- Make sure all objects are bright, and parent the second and third disks to the first. We can save the sun itself as one object, and the corona group as a second object. In the stage editor track the corona to the camera so that it would always be perpendicular to the camera (only good if the camera is moving a little bit).

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## 1.129 SECTION 8 - Essence Settings and Other Attributes

8] Solar Corona, By Scott Kirvan (Imagine 2.9 and higher)

This uses the FIREBALL, NEBULA and GHOST textures to create.

- Add a primitive sphere with it's default values, turn on bright.
- Apply the FIREBALL texture
- Make these adjustments to the texture variables:

Column One Two

—— ———  
0 0

255 0

255 0

100 0

200 0

30 0

0 0

0.4 0

Size: (86, 86, 86)

- Add a primitive sphere with it's default values except for the size values, they should be, at least (75, 75, 75)

Color: (255, 85, 0) Fog length: 0.01

- Apply the NEBULA texture
- Make these adjustments to the texture variables:

Column One Two

—— ———  
325 0

1 0

0 0

5 0

0.2 0

1 255

1 255

0 100

Size: (4.5, 4.5, 4.5)

- Apply the GHOST texture
- Make these adjustments to the texture variables:

Column One Two

—— ———  
1200 0

---



1 0  
 0 0  
 0 0  
 0 0  
 0 0  
 0 0  
 0 0

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## 1.130 SECTION 8 - Essence Settings and Other Attributes

9] Sludge, By Scott Kirvan (Imagine 2.9 and higher)

This uses the DINOSKIN texture:

- Add a primitive cylinder (size: 88, 88, 175)
- Make these adjustments to the attributes variables:

COLOR FILTER SPECULAR

R 255 255 38

G 255 255 38

B 255 255 38

Hardness Index of refraction Phong

20 1.50

- Apply the DINOSKIN texture.
- Make these adjustments to the texture variables:

Column One Two

-----  
 10 0

10 0.5

10 0

2 0

0.3 190

0.6 1.73

2 0.5

1 0  
 -----

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## 1.131 SECTION 8 - Essence Settings and Other Attributes

10] Marble, By Rob Freundlich

Make your object a pale white (190-ish on all the RGB sliders), high Shiny value, high Hardness, low Roughness, Specular just a few shades below the object color, ummm, possibly others as well.

Apply two wood textures. The textures are rotated with respect to each other. Both have very wide bands (and a low number of bands) and a large Variation value (for "bur1" effect, according to Understanding Imagine). The color of each texture is a darker shade of grey than the object, and the two textures have slightly different colors.

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## 1.132 SECTION 8 - Essence Settings and Other Attributes

11] Starfield (Imagine 2.9 and higher)

We all know that Imagine's starfield is very cheesy at best. Here is a great solution for Imagine 2.9 and higher users:

- Create a sphere that is as large as your world, minimum size should be at least 1000 units along each axis.
- Set the sphere's filter values to 255 for each R,G,B component.
- Apply the CONFETTI texture and make these adjustments to the default values:

Color 1: (255, 255, 255) V1: .53 Size: .25

Color 2: (100, 100, 100) V2: .55

Make sure the camera is somewhere in the center, and render. Voila! A great Starfield!

Refer to the docs on the confetti texture to make any adjustments that you like.

Also, try making a short anim with just the sphere, and just change the camera's perspective, you can get a nice space warp effect.

This actually gives a good looking starfield with almost no RAM consumption. Plus, you can easily set the colors and frequency.

As a suggestion,

- 1] Make the sphere bright to make sure the stars show up.
- 2] Make a copy of the sphere and scale it slightly smaller or bigger and rotate it so it's at a diff angle. Then, you'll get a cool rotate effect when you move the camera.

This is called "stellar parallax", and it will never happen in real life, simply because all the stars are so far away that you basically can't move fast and far enough to make their relative alignments change in this kind of obvious way.

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## 1.133 SECTION 8 - Essence Settings and Other Attributes

12] Photon Torpedo (Imagine 2.9 and higher)

In Detail, create a default primitive sphere. Copy it, scale it down to .8, Paste it and group the 2 objects together. The larger sphere's attributes's should look like this:

COLOR

R 255

G 0

B 0

Fog length Phong Bright

125

Then Add a FogPaint Texture with the following data:

T: .8

Denser Color: 255, 100, 0

2nd Color: 255, 0, 0

Scale the axis to be just as big as the sphere.

The smaller sphere's attributes should look like this:

COLOR

R 210

G 15

B 15

Phong Bright

Light:

Color: 500, 0, 0

Point Source

Controlled Falloff

FireBall texture:

Color 1: 255, 15, 15

Color 2: 200, 30, 0

The rest of the settings are 0.

Axis size should be slightly larger than the sphere.

Load this object into Action after setting the # of frames. Add the Spike effect on frames 2 (right after the torp exits the torpedo tube) to the last frame that the object will be in the camera's view. You might want to tweek the Spike settings. Set up the motion in Stage, and you're all set. Render and serve.

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## 1.134 SECTION 8 - Essence Settings and Other Attributes

13] Spaceship shield, By Charles Blaquiere (Essence)

To do a Star Trek-like "shield absorbs energy blast and dissipates it", you need to create a sphere for the shield. You then use Shellturb combined with SwapCRF to vary the transparency of the texture and make the energy blast visible. Here's an example:

- Create a standard Imagine sphere. Scale in Z by 0.5.
- Give it a color of 255, 255, 255 and click on Bright. Add the Bandturb (not Shellturb) texture.

- Edit the texture as follows:

Column One Two

0 0.4 Axis position: 110, 0, 0

20 0.4 Alignment: 0, -90, 0

30 0

20 0

10 0

5 0

4 0

0.4 0

- Add the SwapCRF texture. All parameters should be 0, except Color -> N Filt which should be 1.

- Add the Solid texture. Leave all parameters at -1 and set Color to 50, 255, 200.

- The texture order should read, from top to bottom:

Bandturb, SwapCRF, Solid. If not, use the Priority button to make it so.

- States/Create DEFAULT, click Textures/Brushes on.

- States/Create START, click Textures/Brushes on (This is not a typo. Unless I'm mistaken, you should refrain from using the default state in an animation, which is why I had you create an identical state).

- Change the texture:

Time to 1 Fade to 1 Position to -50, 0, 0

- States/Create END.

- In Action, morph from START to END over N frames.

You'll see an energy blast hit the right side of the image, where the ship inside the shield would presumably be pointing, and travel along the shield, dissipating as it goes along.

How does it work?

The base object is white, and gets a turbulent band of black applied to it using Bandturb. Then, SwapCRF turns this color information into `_filter_` values -- black means no filter, white means fully transparent. This makes part of the shield visible. All that's needed is to give the visible part of shield a color using Solid. Finally, we create two states, START and END, which allow the texture axis to travel from one end of the shield to the other. The END state also has Bandturb's Fade parameter set all the way to 1, so that the texture loses strength as it travels along the shield. Just add a ship inside the shield, and a starfield in the background. The effect is beautiful.

Bug alert:

Imagine 3.1 doesn't remember texture parameters and axis settings very well when you use States. Until that bug is fixed, you will need to create two separate objects, Shield-start and shield-end, and morph from one object to the next. No big deal.

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## 1.135 SECTION 8 - Essence Settings and Other Attributes

14] Spaceship shield, By Michael Hazlett (Imagine 2.9 and higher)

What it will do is simulate a phaser hitting the front and that portion of the shield will show nothing else, this uses standard Imagine 2.9 textures without any Essence ones.

- Create a primitive sphere, scale it to envelop your Starship.
- Give it a color of 0,0,0 and click on Bright.
- Make it a fog object ie: with a length of 50.00.
- Add the Bandturb texture.
- Edit the texture as follows:

Column One Two

0 0.4 Axis position: 81, 0, -0.9

20 0.4

30 0

20 0

10 255

5 0

4 0

0.4 0

(The main difference with Charles Blaquiere tip is that the colour you put on the texture is the colour of the shield, usually green :)

- States/Create START, click Textures/Brushes on.
- Change the texture:

Time to 1

Fade to 1

Axis Position: 67, 0 -0.9

---

- States/Create END.

- In the Action editor morph from START to END over how many frames you like; you have to reverse the states to dissipate the shield.

You'll see an energy blast hit the front (or wherever) of the shield flare up (and if you want) dissipate; you can change how transparent the shield is by changing the fog length :)

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## 1.136 SECTION 8 - Essence Settings and Other Attributes

15] All purpose ground cover (Imagine 2.9 and higher)

Make an irregular shaped mountain or whatever and make these adjustments to the attributes variables:

COLOR

R 15

G 162

B 6

Dithering

255

- Apply the FUZZ texture.

- Make these adjustments to the texture default values:

Column One Two

\_\_\_\_ \_

0.1 0.6

0.2 15

0.05 140

0.3 15

1 0

4 0

0.2 0

0.8 0

- Apply the PEENED texture and make these adjustments to the attributes variables:

Column One Two

\_\_\_\_ \_

1 0

1 0.5

0.1 90

0.5 90

1 0

4 0.6

0.2 1

-0.3 0

- Apply the DISTURBD texture with default values.

- Apply the CRACKS textures as follows:

Column One Two

\_\_\_\_\_

0 90

0.2 80

0.2 0

15 0

0 0.2

0 0.5

-0.1 0.3

-0.1 0.8

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## 1.137 SECTION 8 - Essence Settings and Other Attributes

16] Steam engine, shafts of light (Imagine 2.9 and higher)

Try this out if you want steam, shafts of light, smoke:

- Make a cube and go to the attributes requester.

- Make the object color a shade of white; the filter values are 125, 125, 125.

- Add the COOLFIR texture:

Column One Two

\_\_\_\_\_

0 0

0 0

0 0

0 255

0 255

0 255

0 1

0 3

The texture axis should have the positive part of the Z axis slightly smaller than the object. Scale the X and Y axis by 2 or 3 from their natural state.

You can animate it by rotating around the Z axis or moving along the X and Y axis.

If there are a lot of overlapping layers on the object, make sure resolve depth (preferences editor) is quite high, 9 or so, otherwise you will get black areas on the object.

You can render this in scanline.

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## 1.138 SECTION 8 - Essence Settings and Other Attributes

17] Fun with Fuzz texture, By G. de Beaumont (Imagine 2.9 and higher)

The "Fuzz" texture appears to be ANOTHER one of those undocumented Imagine features. Anyway, I've done some experimentation with the "Fuzz" texture, here's what I know.

Fuzz - Basic features:

It's a "Space Filling" (Impulse terminology) noise type texture. That is, the texture changes along all three axis.

In its most basic form (equal X, Y, Z sizes and low magnitude and velocity noise values), it produces fuzzy globules (approximately spherical masses).

Space between the fuzzy globules shows underlying textures and attributes on the object.

The texture axis orientation (relative to the object) is not particularly important.

Fuzz - parameters:

X, Y, and Z sizes: determines size of the fuzzy globules;

Noise 1 & 2 mag/vel: determines how disturbed the fuzzy globules

become (functions similar to other Imagine noise

type textures);

Dispersion: determines the number of fuzzy globules;

Fuzz clip: appears to affect the spacing of the fuzzy

globules;

Fuzz R, G, B color: determines the color of the fuzzy globules;

Fil./Refl. adjust: sets the filter and reflect attributes of the

fuzzy globules;

Fuzz - General observations:

Increasing the clip value (0.9 - 1.0) can result in overlapping globules with unpredictable results.

Decreasing the clip value to 0 results in zero globules.

The default parameter values produce a nice "TV Static" appearance.

Higher magnitude/velocity values result in a wispy smoke type of appearance (see sample parameter values below) similar to that achieved using the CLRNOIZ texture.



Intermediate magnitude values, low velocity values and repetitively applying the texture can produce a scattered cumulus cloud pattern with the appearance of depth (see below).

Wispy Smoke (a la fuzz):

- Add a default plane.
- Set the object color to 0, 0, 0. Make it bright.
- Adjust the perspective zoom control (Z) such that the plane takes up most of the view.
- Apply the FUZZ texture (using the following parameter values) and quickrender:

Column One Two

```

_____
30 0.4
30 100
100 100
0.6 100
2.8 0
5.8 0
0.3 0
0.7 0

```

Scattered Cumulus Clouds (a la fuzz):

- Add a ground plane.
- Set the color to 135, 206, 235. Make it bright.
- Adjust the perspective angle (A) view such that it looks straight down on the ground plane. Set the zoom ratio (Display menu, Perspective, Zoom ratio) to 0.3.
- Repetitively apply the FUZZ texture to the ground plane (4 times) using the following parameter values:

Apply the FUZZ texture (priority 1) as follows:

Column One Two

```

_____
1000 0.5
1000 245
1000 245
2 245
0.1 0
2 0
0.1 0
1 0

```

FUZZ texture (priority 2):

---

Column One Two

\_\_\_\_\_

1000 0.5 Axis position: 0, -40, 0

1000 220

1000 220

2 220

0.1 0

2 0

0.1 0

1 0

FUZZ texture (priority 3):

Column One Two

\_\_\_\_\_

250 0.5

250 245

250 245

2 245

0.1 0

2 0

0.1 0

0.6 0

FUZZ texture (priority 4):

Column One Two

\_\_\_\_\_

250 0.3

250 215

250 215

2 215

0.1 0

2 0

0.1 0

0.6 0

Transform priority 4 texture 0, -40, 0 position.

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## 1.139 SECTION 8 - Essence Settings and Other Attributes

18] Water (Imagine 2.0 and higher)

You could start with a plane or a ground and make the following adjustments to the object default attributes:

COLOR REFLECT FILTER SPECULAR

R 0 100 0 255

G 255 120 0 255

B 255 140 0 255

Dithering Hardness Roughness Shininess

0 125 (Or more) 20 0

Then apply BUMPNOIZ texture as follows:

Column One Two

100 0

20 0

10 0

0 0

0.6 0

0 0

0.2 0

0 0

Bump-mapping and bump textures do not modify the geometry of the object; they simply add highlights and shadows as if the object `_were_` bumpy. Your lake would still remain a flat plane, with no points to stick out.

You should position the primary light source in front of the camera to obtain specular highlights.

Maybe this is not very helpful, but I thought You might find DINOSKIN texture useful in this case too. It is a very flexible texture which can produce loads of other kind of surfaces than dino skin. The shape of the bumps can be modified to a great extend by adjusting the noise values. Also, You have control of how "widely" the bumps are colored by adjusting the color clip value. So You can certainly make some kind of whitecaps with it without having actual modelled bumps in the object.

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## 1.140 SECTION 8 - Essence Settings and Other Attributes

19] Castle brick, By Paul Rance (Essence)

It uses CEDARDSHINGLES and VARYELBRIGHT Essence textures:

- Apply the FUZZ texture as follows:

Top width: 30.0 Rand shape vary: 0.3

Bottom width: 30.0 Grain scale: 1.79

---

Shingle length: 15.0 Grain sharpness: 0.18  
 Horizontal spacing: 31.0 Grain bump adj.: 0.56  
 Vertical spacing: 16.0 Grain red: 75.0  
 Edge width: 0.4 Grain green: 79.0  
 Bump adj.: 5.8 Grain blue: 73.0  
 Row offset: 0.48 Fade: 0.0

- Apply the VARYELBRIGHT texture as follows:

Vary scale size: 2.07

Variation: 0.2

Random seed: 1234.5

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## 1.141 SECTION 8 - Essence Settings and Other Attributes

20] Cloth, By Paul Rance (Essence)

It uses SEAWAVE Essence textures:

- Apply the SEAWAVE texture as follows:

X im. units: 28.0

Wind speed: 20.0

Bump adj.: 0.5

Time: 0.0

The important bit with this texture is instead of the Y axis pointing out of the texture as normal, turn in 90 degrees so it runs in parallel to the top surface of the object.

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## 1.142 SECTION 8 - Essence Settings and Other Attributes

21] Fabric, By John Prusinski (Imagine v2.9 and higher)

Just playing around with the Fuzz texture I discovered (as I was working on a backdrop curtain for a stage set) that by setting the Fuzz color close to the base color but lighter (in this case light magenta over purple) and cranking the specularity of the object while keeping it in the same color range (in this case VERY light magenta) and the hardness down, I was able to get (by playing with the texture size) a very believable range of fabric textures from coarse wool blanket to fine velvet (which in my case was just what the doctor ordered)!

Not sure if this would have the same effect with a smooth object like a floor or a primitive, but it works great for objects with lots of folds in them to catch the light.

Here it is an attribute I used successfully for the green felt surface of a billiards table:

Apply FUZZ texture as follows:

Column One Two

\_\_\_\_\_

30 0.6

1 0

0.01 140

10.01 100

1 0

4.01 0

0.2 0

1 0

-----

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## 1.143 SECTION 8 - Essence Settings and Other Attributes

22] Glowing fireball, By Steven Blackmore (Imagine 2.9 and higher)

This uses standard Imagine 2.9 and higher Peened, Fakely and Ghost textures.

- Add a default primitive sphere.
- Select it, open the attributes requester, add the Peened texture and enter these settings:

Column One Two

\_\_\_\_\_

6 0

6 1

6 -1

0.5 -1

1 -1

4 0.6

0.1 1

1 0

The scale of the individual pebbles is set rather small, to create a rather 'static' or rough appearance to the sphere.

- Next, add the Fakely texture:

Column One Two

\_\_\_\_\_

0 238

0 21

0 0

0 255

0 249

0 92

0.5 0

0 0

It colors the sides and the front of the object differently. It does this by checking the angle between the incoming camera ray and the surface normal of the object at the point being rendered. Coincidentally, bump textures and altitude maps create the illusion of bumpy by altering the surface normal. Bump textures can therefore alter the effect of Fakely. It is important to remember that the bump textures must be applied BEFORE either Ghost or Fakely.

- Make the object a foggy object, sets its Fog Length to 12.

Fog objects are inherently bright, so there is no reason to set the Bright attribute on the object, as it has no effect.

- Apply Ghost texture as follows:

Column One Two

—— ———

350 0

1 0

0 0

0 0

0 0

0 0

0 0

0 0

Like the Fakely texture, Ghost texture uses the surface normal to perform its edge fading magic. Actually it's the cosine of the angle between the camera ray and the surface normal that is of interest. This value can range from 0 to 1. A value of 0 means the point on the object is pointing directly at the camera, a value of 1 means that the point on the object is at 90 degree angle from the camera, or on side of the object.

By setting a new instance of the Fakely texture to affect filter it is possible to create a similar effect, the main advantage of using fog objects is that they do not cast shadows. There is a problem using fog objects because overlapping fog objects don't render as expected.

When creating things like explosions, multiple fireball effects may be needed. When You need both a fireball plus flaming shrapnel trails You should create the fireball using a large fog sphere and the Ghost texture. Then You should use a solid object modified by Fakely to create the emerging smoke and fire trails.

- First, the object needs to be made Bright, next add another

Fakely texture:

Column One Two

—— ———

2 255

0 255

0 255

0 -1

0 0

0 0

0.5 0

0 0

You should also experiment with larger size values for Pebbled. Large pebbles, say 5/5/10 (x/y/z size) produces another startling effect. This one reminds me of a cheap restaurant table candle.

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## 1.144 SECTION 8 - Essence Settings and Other Attributes

23] Nebulae, By Steven Blackmore (Imagine 2.9 and higher)

While working on an image (Disaster!), I became frustrated with Imagine's Nebula texture. The texture creates a nice wispy, nebulous look, but is inadequate for creating realistic astronomic nebulae. So, I set out to discover a better way. After many hours of experimenting I was ready to give up when a sudden inspiration hit. I tried applying Pebbled to a fog object, then applied Ghost, and rendered. My jaw hit the floor.

So what do bump textures like Pebbled have to do with fog objects? The key to the resulting affect is Ghost. The Ghost texture was designed to fade a fog object at its edges. In order to determine what part of the object is facing the camera, and what parts of the object are its 'sides', the texture looks at the angle the ray from the camera makes with the surface normal. The surface normal is an imaginary line that is perpendicular to the surface of the face (triangle) being rendered. In other words, a line pointing directly out from the surface. If the angle between the camera ray and the normal direction is 0.0, the object is facing the camera. If the angle is 90 degrees, the face being shaded is currently on the side of the object, etc. When Ghost is applied to a fog object, as the angle between camera ray and normal increases, the fog length is adjusted according to the values set in Ghost's requestor. Coincidentally, bump textures do their magic by adjusting the surface

normal of the point being shaded. When Pebbled is applied to an object, it alters the surface normal to give the illusion of bumps on the object. When Ghost is subsequently applied, it finds modified normal values, which alter where Ghost does its fog thinning.

Enter Detail editor:

- Add a primitive sphere.
- Use Magnetism or Deform Tool to distort the sphere into a shape

500 units long, 150 high and 100 deep.

- Add the Wrinkle texturew as follows:

Column One Two

\_\_\_\_\_

60 -1

8 0

8 0

1 -1

0.5 0

4 0

0.1 0

0.4 0

- Add the Fakely texture:

Column One Two

\_\_\_\_\_

0 60

0 0

0 150

0 255

0 180

0 200

0.9 0

0 0

- Make the object a fog object, set the object's Fog Length to 120.

- Add the Ghost texture and use the following settings:

Column One Two

\_\_\_\_\_

1500 0

0.35 0

0 0

0 0

0 0

0 0

0 0

0 0

In most cases it is best to set T to 1.0. This means the Fog Length At T value will be specifying the fog length at the side of the object, which makes it easier to predict the results.

- Add 3 more instances of the Wrinkle texture:

Column One Two

\_\_\_\_\_

60 -1

20 0

20 0

1 -1

0.3 0

4 0

0.05 0

0.4 0

For more variety in the clouds, add more instances of the bump Wrinkle texture.



Column One Two

\_\_\_\_\_

30 -1

8 0

8 0

1 -1

0.5 0

4 0

0.1 0

0.8 0

And a fourth Wrinkle texture:

Column One Two

\_\_\_\_\_

10 -1

10 0

2 0

1 -1

1 0

4 0

0.4 0

0.7 0

- For even more variety, add the Bump Noise texture as follows:

Column One Two

\_\_\_\_\_

40 0

10 0.3

5 0

0.4 0

0 0

4 0

3 0

1 0

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## 1.145 SECTION 8 - Essence Settings and Other Attributes

24] Fire and ice, By Gabriele Scibilia (Imagine 2.9 and higher)

This technique uses Steven Blackmore's DE\* texture family and TOOLKIT I textures, available only for Imagine PC version.

Enter Detail editor:

- Add a primitive sphere and set Index of refr. to 1.31.
- Add the DEFLTR-A texture.
- Add the (Steven Blackmore's Texture Toolkit) FILTER texture:  
set New Filter Red, Green, Blue parameters to 255 (or set the  
Transparency value of standard Imagine TRANSPAR texture to 1.0).
- Add the DEFLTR-B texture (size: 15, 15, 15) as follows:

Column One Two

\_\_\_\_\_

2 1

0 10

0 0

0 0

0 0

0 0

0 1

1 0

- Add the DEREFL-A texture.
- Add the (Steven Blackmore's Texture Toolkit) REFLECT texture and  
set New Reflect Red, Green, Blue values to 60 or add a standard  
Imagine CHECKS2 texture:

Column One Two

\_\_\_\_\_

0 -1

-1 -1

-1 0

-1 0

60 0

60 0

60 0

-1 0

- Add a reflection brushmap (e.g. a sky picture).
- Add the DEREFL-B texture (size: 15, 15, 15):

Column One Two

\_\_\_\_\_

2 1

0 10

0 0

0 0

0 0

0 0

0 1

1 0

- Add the DECOLR-A texture.

- For more variety in the fire, add more instances of the WRINKLE texture:

Column One Two

\_\_\_\_\_

5 200

10 100

2 0

1 120

0.5 30

4 0

0.1 0

0.2 0

Column One Two

\_\_\_\_\_

20 150

20 100

2 50

1 20

0.5 50

4 20

0.1 0

0.4 0

Column One Two

\_\_\_\_\_

8 200

5 50

5 0

1 150

0.5 50

4 20

0.1 0

0.4 0

And a fourth WRINKLE texture:

Column One Two

\_\_\_\_\_

12 240

2 150

2 0

1 150

0.5 80

4 0

0.1 0

0.2 0

- Add the DECOLR-B texture (size: 15, 15, 15):

Column One Two

\_\_\_\_\_

2 1

0 10

0 0

0 0

0 0

0 0

0 1

1 0

You can also apply MNTNTOP texture as follows and drop the DEFLTR-A/FILTER/DEFLT-B texture attributes:

Column One Two

\_\_\_\_\_

0 -1

0 -1

0 -1

0 255

255 255

0 255

0 1

0 1

Change the texture size to 13, 13, 13 and rotate the axis so

Z points up and render.

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## 1.146 SECTION 8 - Essence Settings and Other Attributes

25] Quick & dirty way to make trees, By Greg Tsadilas (Imagine 2.9)

This technique uses Steven Blackmore's FRPAINT texture, available only for Imagine PC version.

Add a default primitive sphere and modify Color value to 80, 80, 80 then add DINOSKIN texture:

Column One Two

\_\_\_\_\_

5 0

5 0.5

5 0

1 200

0.3 100

0.6 0.5

1 0.7

1 0

Add Steven Blackmore's FRPAINT texture:

Column One Two

\_\_\_\_\_

80 0

80 0

80 0

0 0

255 0

255 0

255 0

0 0

The leaves are deformed spheres with DINOSKIN texture applied to them; the shape, color, size and bump values can be adjusted to Your liking.

As You add more and more layers of filtered objects, You may notice some sphere rendered as solid black: You'll need to increase the RSDP (Resolve Depth) value.

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## 1.147 SECTION 8 - Essence Settings and Other Attributes

26] Ship texture (Imagine 2.9 and higher)

Here's a great tip for created good spaceship textures: use a light DINOSKIN texture (with only a slight variation of Your main colour applied to the object) with the bumpiness set to 0%, this will give a nice colour variation on the object instead of just a plain colour. You may have to increase the dinoskin size for various object sizes to start to look good.

Now just apply the DETHSTAR texture, You need to have a big size for DETHSTAR to make it look good so increase the default size and take down the "dirt" and increase the "rust".

Apply large amounts of specularity and hardness and there You go, a nice spaceship texture. I have uploaded two pics to demonstrate (ftp to tomahawk.welch.jhu.edu/pub/lw/framestores/ship.jpg and ship2.jpg).

Ship.JPG uses the nebula texture with Imagine lens-flares to create a nice engine glow. A good way to create Lightwave lens-flares in Imagine (as used in Ship2.JPG) is to get a Lightwave user (boo, hiss) to render a full screen lens-flare on a black background with lens-reflections off.

Now convert the image from whatever format into TGA/TIF/IFF using whatever resolution You want (the bigger the better). Use this as a brushmap TWICE on a 1x1 plane... once as an opacity map and secondly as a filter map (set to reverse image) so the darker parts with be see-through. Now make it bright and render it.... It should look like a fully fledged Lightwave lens-flare in Imagine.

To place it in a scene make sure it's aligned to the object "camera" and large enough to look good. The lens-reflections (the coloured spots of light) can be applied to great effect by using a package such as PhotoStyler using a large low opacity round brush and whatever colour You want to compliment the picture (reds greens and blues are best). I've managed to successfully trick my Lightwave owning friend using this technique by rendering Babylon5 type scenes which exhaustingly use lens-flares for each scene.

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## 1.148 SECTION 8 - Essence Settings and Other Attributes

27] Carpet, By Robert Byrne (Imagine 2.9 and higher)

Here's the attributes for a mottled carpet I did for a room floor, apply it to a plane with its Z axis perpendicular.

COLOR

R 185

G 86

B 0

Phong Off Roughness

0 192

All other settings to default.

Add Fuzz Texture:

Column One Two

\_\_\_\_\_

30 0.6

1 210

0.35 105

0.4 20

1 0

4 0

0.2 0

0.7 0

Apply then the Splotch Texture as follows:

Column One Two

\_\_\_\_\_

1 0

1 0.6

0.9 0.55

0.83 0.6

0.65 0.7

0.73 0.8

1 0.9

0.5 1

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## 1.149 SECTION 8 - Essence Settings and Other Attributes

28] Plasma beam, By Steven Blackmon (Imagine 2.9 and higher)

Enter Detail editor:

- Add a primitive tube, Radius 30, Height 400.
- Enter Attributes requester and make the following adjustments:

COLOR REFLECT FILTER SPECULAR

R 255 0 255 0

G 255 0 255 0

B 255 0 255 0

Dithering Hardness Roughness Shininess Bright Phong

255 0 0 0

- Add the DANCSPRK texture (size: 145, 145, 480)

Column One Two

\_\_\_\_\_

4 0

0.5 0

255 0

150 1

240 1

0 0.2

3 5

0 0

- Apply two more instances of DANCSPRK texture as follows:

Column One Two

\_\_\_\_\_

16 0

0.1 0

255 0

150 1

240 1

0 0.2

3 5

0 0

Size: (332, 332, 480)

Column One Two

\_\_\_\_\_

4 0

0.2 0

255 0

220 1

255 1

0 0.2

3 5

0 0

Size: (145, 145, 480)

- Add a tube, Radius 55, Height 400:

COLOR REFLECT FILTER SPECULAR

R 180 0 255 0

G 69 0 255 0

B 106 0 255 0

Dithering Hardness Roughness Shininess Bright Phong

255 0 0 0

- Set Fog Length to 0.01.

- Add three instances of the DANCSPRK texture:

Column One Two

\_\_\_\_\_

4 0

0.5 0

150 0

150 1



240 1

0 0.2

3 5

0 0

Size: (221, 221, 480)

Column One Two

—— ———

4 0

0.3 0

255 0

220 1

255 1

0 0.2

3 5

0 0

Size: (221, 221, 480)

Column One Two

—— ———

16 0

0.2 0

255 0

255 1

255 1

0 0.2

3 5

0 0

Size: (504, 504, 480)

- Then, add FOGPAINT (size: 89, 89, 58):

Column One Two

—— ———

250 255

0.9 0

0 0

0 0

255 0

230 0

255 0

0 0

- Add one more tube, Radius 70, Height 400:

COLOR REFLECT FILTER SPECULAR

R 255 0 255 0

G 255 0 255 0

B 255 0 255 0

Dithering Hardness Roughness Shininess Bright Phong

255 0 0 0

- Add DANCSPRK as follows (size: 330, 330, 480):

Column One Two

\_\_\_\_\_

8 0

0.15 0

255 0

160 1

240 1

0 0.2

3 5

0 0

Column One Two

\_\_\_\_\_

16 0

0.1 0

255 0

150 1

240 1

0 0.2

3 5

0 0

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## 1.150 SECTION 8 - Essence Settings and Other Attributes

29] Nebulae, By Tom Granberg (Imagine 2.9 and higher)

I have come up with a nice nebula effect using a tube, here is how to do it.

Make a tube that is about twice as wide as it is high.

Make it bright and colored total black.

Add the Filter Noize 2 texture and scale it in z so it is fairly thin in z, but at least as wide in x and y as the tube.

Make the texture filter settings high and in some cool colors like: R.255, G.180, B.220 (You get the point), if You want more color variance add the Color Noize 2 texture as well.

Add Mountain Top twice, one to fade it out at the top and one at the bottom.

It's very important that the textures are in the right sequence, so first Filter Noize 2, Color Noize 2, Mntop (1), Mntop (2).

This should give You a good starting point to play with, the tube don't have to be very detailed and You can scale it to fill Your universe, so when paning You will get a nice long nebula. I also tilt the tube a bit on an angle to get it more interesting.

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## 1.151 SECTION 8 - Essence Settings and Other Attributes

30] Lightning, By Fred Aderhold (Imagine 2.9 and higher)

I was trying to simulate white bolts with a bluish haze on the outside:

- Add a default plane and modify the following settings:

COLOR FILTER

R 0 255

G 108 255

B 255 255

Brightness

255

- Add the DANCINGSPARK texture (Z axis perpendicular to the plane):

Column One Two

\_\_\_\_\_

2 0

0.1 0

168 0

173 1

195 1

0 0.2

3 5

0 0

- Transform the size of the axis to (144, 144, 144), or whatever

looks good.

This will give You a transparent plane You can put thru another object to make it look electrified. How 'bout some blob clouds, complete with lightning strike!

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## 1.152 SECTION 8 - Essence Settings and Other Attributes

31] Fire, By Steve Worley (Essence)

Enter Detail editor:

- Add a primitive plane (Horizontal & Vertical sections = 1)

and modify the following settings:

COLOR

R 0

G 108

B 255

Bright

- Add Essence TurbColor texture:

Parameter Value

Initial Scale 15

# of Scales 5

Scale Ratio 0.4

Amplitude Ratio 0.4

Time Ratio 0.4

Time 0

Base->1 Trans 0

1->2 Trans 0.5

Color 1 End 1

Color 1 Red 200

Color 1 Green 100

Color 1 Blue 30

Color 2 Red 180

Color 2 Green 30

Color 2 Blue 0

Fade 0..1 0

- Then add Essence LinearTurb texture:

Parameter Value

Z Trans Start 0

Z Trans Width 20

Sharpness 0

Trans Vary 60

Initial Scale 15

# of Scales 5

Scale Ratio 0.4

Amplitude Ratio 0.4

---

Time Ratio 0.4

Time 0

Color Red -1

Color Green -1

Color Blue -1

Filter Red 255

Filter Green 255

Filter Blue 255

- Finally, add Essence Linearsm texture:

Parameter Value

Z Trans Start 0

Z Trans Width 80

Sharpness 0

Color Red 30

Color Green 0

Color Blue 0

Reflect Red -1

Reflect Green -1

Reflect Blue -1

Filter Red -1

Filter Green -1

Filter Blue -1

Fade 0..1 0

Position: (0, 0, -30)

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## 1.153 SECTION 8 - Essence Settings and Other Attributes

32] Clouds, By Mike McCool (Essence)

Enter Detail editor:

- Add a Ground and modify the following settings:

COLOR FILTER

R 240 40

G 240 40

B 240 40

- Apply Clusterbump texture as follows:

---

Parameter Value

Clump scale 5000

Cluster scale 3.3676

Clump coverage 1

Edge color fade 0.6

Clump bump 0.3

Cluster bump 0.6

Cluster red 200

Cluster green 200

Cluster blue 200

(other settings to 0)

- Apply Essence Blobf texture:

Parameter Value

Initial scale 120

# of scales 4

Scale ratio 0.4

Amplitude ratio 0.4

Time ratio 0.4

Time 0

T1 start 0.2

T1 end 0.4

T2 start 0.8

T2 end 0.96

Filter red 255

Filter green 255

Filter blue 255

(other settings to default values)

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## 1.154 SECTION 2 - Modeling and Detail Editor

33] Asteroids, By Gabriele Scibilia (Imagine 2.9 and higher)

I have come up with a nice asteroid using Magnetism function on a default primitive sphere, here is how to do it.

Enter Detail Editor:

- Add a primitive sphere.

- Working with Magnetism settings and Drag Points mode make

---

Your asteroid shape, modify then the following attributes:

COLOR

R 255

G 130

B 0

- Add PEENED texture as follows:

Column One Two

\_\_\_\_\_

37 0

37 0.5

37 150

0.5 80

1 0

4 0.6

0.2 1

-0.6 0

- Add BUMPNOIZ:

Column One Two

\_\_\_\_\_

3 0

3 0

3 0

0 0

0.4 0

0 0

0 0

0 0

This works fine for me, You may try different BUMPNOIZ and PEENED sizes or add the WRINKLE and DIRT textures.

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## 1.155 SECTION 2 - Modeling and Detail Editor

34] Alien surfaces, By Tom Grandberg (Imagine 2.9 and higher)

After editing Your bloody alien model enter Attributes requestor and modify the following default settings:

COLOR SPECULAR

R 96 179

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G 94 199

B 110 255

Hardness

25

- Add CRUMPLED texture:

Column One Two

\_\_\_\_\_

10 0

10 2

10 0

1 0

1 0

4 0.6

0.2 1

-0.7 0

- Then, add CRACKS (size: 2, 2, 6.5):

Column One Two

\_\_\_\_\_

0 -1

1 0

2 0

0.1 0

1 1

0.2 0.5

-1 0

-1 0

Other cool settings use CRUMPLED, LEATHER and TERRA textures:

COLOR SPECULAR

R 117 209

G 125 224

B 98 208

Hardness

127

- Add CRUMPLED texture:

Column One Two

\_\_\_\_\_

10 0

10 2

10 0



1 0

1 0

4 0.6

0.2 1

0.9 0

- Add LEATHER as follows:

Column One Two

3 0

3 0

3 0

0.4 0

0.6 0

0 0

0 -2

0 0

- Add TERRA texture:

Column One Two

0 0.2

0.2 0

10 -1

2 0

1 0

120 0

120 0

100 0

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## 1.156 SECTION 9 - Miscellaneous

1] What the heck is BTW, IMO and other weird abbreviations...

BTW is an abbreviation for "By The Way".

IMO is an abbreviation for "In My Opinion"

IMHO is an abbreviation for "In My Humble Opinion"

IML is an abbreviation for "Imagine Mailing List"

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:) is a sideways smiley face

:( is a sideways frowny face

;) is a winking-eye face etc...

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## 1.157 SECTION 9 - Miscellaneous

2] My rendering times and even my refresh times in the editors are much MUCH too slow, even with an accelerator. Is there any basic tricks or hints that are often overlooked that might help me out?"

Always be sure to MERGE your objects. This eliminates multiple faces, points and lines. So me ob jects have a VERY large number of these and it can slow your times down by up to 1/2!

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## 1.158 SECTION 9 - Miscellaneous

3] When does one get good enough so that they don't render ugly pictures!

Practice with a simple objects (to cut down trace time) over and over and over. Varying lighting & color etc. This will allow you to get the effect you want which is only a technical problem.

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## 1.159 SECTION 9 - Miscellaneous

4] Hires Video modification for Amiga Imagine From James R. Walker

\*\*\*Note: The following explains how to modify the actual executable file of Imagine. Do this at your own risk! If you have any problems or end up trashing your copy of the program it is your own fault. It is highly recommended that you make a backup copy of the program before you mess with it.

Ok, here's how it works... (If you don't have an Amiga, don't do this!)

Get a filezapper type program. (NewZap DPU FileZap Hex etc...)

Look up your version of Imagine on the chart below.

Edit the executable at the bytes indicated in the chart. The block #s and byte #s are shown in decimal. The hex numbers in parenthesis are the hex versions of the block numbers. The bytes to modify are, of course, in hex. Replace the resolution you find there with the resolution you want. Then save the new file. (I don't have to remind you to keep a backup of Imagine on hand!)

Notice that Imagine automatically doubles the vertical resolution for use in interlace mode. So, if you want vertical resolution of 462 then you must tell it to give you 231. (231 = 00E7 in hex)

Imagine Version # Horizontal Vertical

FP 1.1 Block 393 (\$189) Block 83 (\$053)

Bytes 220 & 221 Bytes 162 & 163

From 02 80 From 00 C8

(Example: To 02 BC = 700 in dec)(To 00 E7 = 231 dec)

FP 2.0 Block 497 (\$1F1) Block 95 (\$05F)

Bytes 328 & 329 Bytes 250 & 251

From 02 80 From 00 C8

INT PAL 2.0 Block 500 (\$1F4) Block 94 (\$05E)

Bytes 124 & 125 Bytes 42 & 43

From 02 80 From 01 00

FP PAL 2.0 Block 497 (\$1F1) Block 95 (\$05F)

Bytes 388 & 389 Bytes 244 & 245

From 02 80 From 01 0

INT 2.9 Block 1561 (\$619) Block 119 (\$077)

Bytes 486 & 487 Bytes 480 & 481

From 02 80 From 00 C8

FP 2.9 Block 1529 (\$5F9) Block 95 (\$05F)

Bytes 82 & 83 Bytes 168 & 169

From 02 80 From 00 C8

FP PAL 2.9 Block 1529 (\$5F9) Block 95 (\$05F)

Bytes 146 & 147 Bytes 162 & 163

From 02 80 From 01 00

FP 3.0 Block 1667 (\$683) Block 126 (\$07E)

Bytes 60 & 61 Byte 425

From 02 80 From 64

FP 3.1 Block 1765 (\$6E5) Block 131 (\$083)

Bytes 424 & 425 Byte 343

From 02 80 From 64

Block + Offset is commonly used with most disk editors, but some use the Absolute Portion instead. Remember to divide the height of the screen by 4 first, and that you can't use values higher than 127 due to Impulses use of signed character storage. 127 will give you screen height of 508. I don't think its easily possible to hack Imagine to use an unsigned character to get a higher screen size. Anyone?

One Final Note: Imagine PC users have a whole different program than Amiga users. This modification will not work on the PC version. I would guess that a similar modification for the PC version would be more complicated, given that VGA modes are more complicated than Amiga modes.

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## 1.160 SECTION 9 - Miscellaneous

5] What are particles? (Note: Particles were add in Imagine 2.9)

There are a couple of different meanings and interpretations of what particles and particle animation software should do. In general, a particle is an object, or point in 3D space that is then controlled by parameters mimicking real world physics. For example, take a point in 3D and apply motion to it as if it were under gravity. The result would be it would move downward increasing in speed. So you can use particles to simulate wind, exploding, melting and other things that move points in different ways.

Particles can also be objects or simple polygonal shapes rather than just points. In imagine, you can make a 'particle object' by modeling a normal object with faces. Then, using the particle requestor in the Detail Editor, specify that all faces/polygons of the object be replaced by cubes, spheres, tetrahedrons and so on...or even other objects. When you go to render the object, each face will be replaced with the particle you have chosen.

This means in Imagine, you can make objects created out of many 'particles' even though you don't use any particle type of motion. This is true since you could now take that object, and just animate it normally using standard key frame techniques and so on.

However, Imagine does have a new method for applying the motion control over these particle objects, (or even normal objects, since it will simply affect the faces). In the Action Editor you can now use the particle effect. This lets you specify how the particle/faces of the object will be affected over the course of an animation.

In general, particle systems allow one to simulate complex motion easily. They allow one to create many particle objects and to have their motion defined by mathematical properties.

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## 1.161 SECTION 9 - Miscellaneous

6] Everything about motion blur, By Mark Allan Fox

I thought that I would divulge the information I know about this subject as well as why I sincerely doubt that Impulse will include this feature in any of the upcoming upgrades. I will also give some hints as to how to simulate motion blur (actually it really isn't simulating, it is the real thing) using Imagine (or any other rendering program for that matter) and an image processing package.

Motion Blur - What is it? How do we get it?

The human eye does not see motion as most computer renderers see it. The human eye does not see motion as a continuous set of instantaneous pictures. The human eye sees motion through persistence of vision. Our eyes are constantly taking visual data from our surroundings, the data our eyes feed to our brains is not sampled.

This is a difficult effect to achieve on the computer. There are algorithms that allow a computer to achieve real motion blur, but these tend to be really slow if your using a large number of polygons. They get even more complex, and even slower, if you start moving objects along spline paths (if you're interested, and have access to a good library, check out Computer Graphics, Volume 17, Number 3, July 1993, Temporal Anti-Aliasing in Computer Generated Animation). Much faster ways of approximating motion blur exist. These approximations hide some of the temporal-aliasing (aliasing over time) while the real motion blur method completely eliminates it.

Some programs use a method much like the way Imagine casts multiple rays while ray-tracing to eliminate regular (spacial) aliasing. This method is called distributed ray-tracing. While Imagine (3.0) can cast many rays through the area of a pixel to approximate the pixel's average color value, motion blur casts many rays over time through the area of a pixel to determine that pixel's average color value (note that both methods can be combined without necessarily increasing the rays cast. Realistically the number of rays should be increased, perhaps by a factor of two, because when combined the two methods tend to have a negative impact on each other's approximations).

Distributed ray-tracing is fairly easy to implement \_when ray-tracing\_. It becomes infinitely more difficult when using a scanline renderer (so difficult, in fact that I won't even discuss it).

Motion Blur - Why Impulse probably won't implement it?

As pointed out above, motion blur is hellishly hard to implement in scanlining (because scanlining does hidden surface removal on a line, actually a plane, that passes through a row of pixels). I'm sure that this method can, and has, been implemented, but by a company much larger and richer than Impulse (like Pixar).

Problems exist in the distributed ray-tracing method as well. For this method to work it must have information about every objects position over time (or at least the frame to be traced and the two adjacent frames). Imagine's global effects are given access to much information about a \_single frame\_, and they can be used to control the renderer (as in depth of field), but I'm guessing that they can't access anything but the information about the current frame. So, Impulse would have to over-haul Imagine to implement motion blur. If you look at versions 2.0, 2.9, 3.0 and soon 3.1, you'll notice that almost all the new features are add-ons and really aren't integrated into imagine as a whole. It's great that Impulse planned far enough ahead to allow Imagine to be so modular that these new features are just added-on. Unfortunately, I really don't think Imagine's modularity goes far enough to allow an easy addition of motion blur. So until Impulse completely rebuilds Imagine (something

, I for one, think is due) I sincerely doubt that we will see motion blur in Imagine. Of course I sincerely hope that I am absolutely wrong in the above and that Imagine isn't designed the way I think it is, then perhaps we might see motion blur in one of the next few updates.

Motion Blur - How do I do it on my own?

Motion blur is quite easy to approximate on your own. However, it does have costs, namely, increased rendering time (everyone knew that one was coming), and an increase in storage space for the individual frames before they are compiled into an animation. There is a slight increase in the space the animation will take too.

Simply put to achieve motion blur render more frames than you actually need. So, depending on the amount and speed of the motion in an animation, you render perhaps 3 times as many frames as you want to be in your animation. So if you have a 10 second animation (300 or 240 frames) render 900 or 720 frames. Then use an image processing package to average 3 frames into one. So for frame 1 in the animation you will average frames 1,2 and 3 (DTA does this on the PC, the command for compiling the above example into an FLC file would be <dt a pic\*.tga /a3>)

The real trick here is to figure out how much motion blur you need, if you need it at all. Generally, I find that if an object moves across the whole screen in one frame I will want about 30 sub-frames per frame (big hint: avoid the above case). So if it moves across half the screen I will want about 15 sub-frames per frame. It's also nice to always use an odd number of sub-frames. That way you know the objects exact location at any given frame (in the middle sub-frame).

Another problem arises when working on looping animations. The first and the last frame will not look correct. What you have to do is tack on some extra frames before the first and after the last frames. The number you add depends on the number of sub-frames you are using. If N is the number of sub-frames you are using you have to add (N/2)-1 frames to each end of the animation. You then have to set up in the action editor so that the first (N/2)-1 frames look like the last (N/2)-1 frames and vice-versa.

Sometimes you have a scene where motion blur is only needed for a few frames or to one degree or another. This is where scene planning comes into play. Personally I haven't had enough practice in doing this to tell anyone how to achieve this. I have had some success at this, I just haven't yet realised a good method of approaching the problem. A good work around is to plan your camera angles so that you cut from one degree of motion blur to another when the camera changes views. If you have no choice but to have one consistent camera angle then start drawing time-lines, make lots of copies of the whole project (one for each degree of blur), and think hard about what your going to do before committing yourself to the final render. Of course if you have a Pentium 100 and a couple gigabytes of hard drive space you may be able to use brute force and just do everything at the maximum needed degree of blur (not recommended, as you'll save yourself more time by setting up everything the

hard (or is that the easy) way, especially if this is a long animation).

If you have more interests in motion blur try Computer Graphics: Principles and Practice, Fundamentals of 3D Computer Graphics, the comp.graphics, comp.graphics.algorithms, newsgroups, or contact me.

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## 1.162 SECTION 9 - Miscellaneous

7] 3D stereograms, By Gary Beeton

We all know that Imagine allows you to create stereo pair images for use with special 3D glasses. But did you know that Imagine 3 will, with the help of shareware, let's you create 3D images that do not require glasses and that you can also print?

I'm talking about SIRDS (Single Image Random Dot Stereograms) or sometimes called Stareogram; you know, those posters made of dots which, when you look (persistently) straight through them, will reveal extruding shapes.

It's easy! All you need: a shareware SIRDS generator (I'm not sure about the PC, but for the Amiga there's a bunch of them in Aminet under gfx/3d), Imagine 3.0 and a scene.

An example:

Load an object into the Detail editor (i.e. Cow.iob). To simplify the process UnGroup any parts then Join them all together as one object.

Attributes should be: Color white, set the rest to zero (0); Bright should be on (x), set Quickdraw on (x) and Texture: ZBuffer. Now reset your perspective view and rotate your object just as you would like to see it by the camera as viewed in the perspective view. This is important because ZBuffer is relative to Global coordinates, and not relative to the camera.

Go into the "Top" view window, turn Coordinates on, move your cursor to the bottom of the bounding box and write down the Y coordinate (Y1), move the cursor to the top of the bounding box and write down the Y coordinate (Y2). These two Y coordinates should be entered in the ZBuffer texture's Y1 and Y2. Leave the color settings from white (255,255,255) to black (0,0,0) (assuming your SIRDS generator expects white as out and black as in). Save the object.

Go into Action editor, Add your object and set camera position to 0,Y1-n,0 alignment to 0,0,0 where n is the distance from the object to be viewed.

Save Changes. Go to Stage editor, add a light and place it anywhere in front of the object, turn on camera view and fine tune the placement of the camera making sure not to change it's alignment.

Render.

The resulting image should be a gray scale image which can be loaded into and processed by a SIRDS generator. I've had excellent results with this technique, many of which surpassed some commercially available SIRDS posters.

The 3-D option: X-Specs "driver"

The 3-D option in Imagine is designed to produce a format which is viewable using 3-D LCD shutter glasses called X-Specs. The X-Specs "driver" interleaves the top and bottom halves and synchronizes the right/left lenses with the interleave refresh rate of the display. The top and bottom halves appear squashed because each represents one field (half of the data for a full frame). Unfortunately for Imagine PC users, I think X-Specs are only available for the Amiga. This would appear to be a vestigial "feature" from Impulses' attempt to make the PC and Amiga versions have the same look and feel.

I don't think there is a way to have Imagine separate the images into separate files. To overcome this problem I would try doubling the project's vertical resolution and make the aspect ratio 2:1. Then use an image processor to reset the aspect back to 1:1 to unsquash, then separate the images. An alternate method would be to manually reposition the camera for each left and right image (this will be a big pain if you intend to animate though).

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## 1.163 SECTION 9 - Miscellaneous

8] Working with bitmaps, By Douglas Smith

I find that the best sort of image to work with is obviously one made up of lots of lines, some of the best are those nice little painting illustrations that are always part of the instruction sheet for model kits.

If you're using one of these, set your scanner to text mode, 200dpi seems to work best and scan. Then clean up the image in DPaint, this is the key step, so don't skimp, get an image made up of smooth sharp lines.

If you are using a colour image, you need to get it into two colours, for this either start drawing on top in DPaint, then stencil your new lines and rub out the image. One method that can work, is to use an Emboss command (have a look at PBM tools), this will effectively outline different blocks of colour, you can then just touch it up in DPaint. Beware that you tend to lose a lot of dimensional accuracy doing this unless you have a really hires image, so be careful.

If the drawing is to scale, mark a scale on it, a simple graduated bar, preferably one horizontal and one vertical round the part of the image that you are interested in. When you clean up the drawing make sure these scale marks are clear. You can later use these marks to scale the bitmap to an image grid.

Now use ConvertIFF/ILBM, say no to the add faces requester, and in a minute or so all the lines will appear. Now all you have to do is to go into pick points mode and tidy it up a little more. Save this.

If you have a plan, front and side view you can position these objects so they are visible in their respective window, but not visible in the other windows, i.e position the front view so it is say, 500 units in front of the world-centre etc. then redraw speeds are quite nippy.

Using this method may be a bit more memory intensive than using a bitmap, but you can zoom in to see finer detail. Also the images can be to a known scale and you can scroll the windows about without losing the image.

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## 1.164 SECTION 9 - Miscellaneous

9] What are N.U.R.B.S?

Non-uniform rational b-spline (NURBS). It's a special type of spline that allows more intuitive control over surface modelling than a lot of other spline methods. Surfaces have control points that are used to deform the surface of the object which is represented by mathematical formulas rather than polygons.

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## 1.165 SECTION 9 - Miscellaneous

10] What's a Blob?

(From Blob Sculptor documentation)

In 1982 J.F. Blinn modeled molecular shapes using an object which consisted of a point (the center of the object) and a radial field which decayed exponentially as a function of the distance between any given point in space and the center of the object. A test point near to the center of this object would have a very high potential field. As this point was moved outward, its potential field would reduce until, at a given distance R (the radius) it would go to zero. This object is called a "Blob".

Blobs consists of an arbitrary number of objects, called "components" which interact with each other. A "spherical component" is a blob component which has the geometry of a sphere (there are cylindrical, and conical components too!). In order to find the interaction between all the components of a given blob, a test point in 3D space is evaluated in terms of the potential field that EACH component contributes. The individual potential field of a component is called it's "density" or "strength". This strength can be positive or negative. Once all the contributions of all the components for a given test point are calculated, they are added up. Since some of the strengths may be positive or negative, the object may or may not have a value at the test point.

Finally, in order to know if that point in the object will be part of the final surface, the total strength of that point is compared against a "threshold" value. If the strength  $\geq$  threshold then the point exists, else it disappears. The threshold value can be thought of as a filter; the higher the threshold, the stronger the blob component must be in order to be visible.

Once all the points in space are calculated, an algorithm called "marching cubes" is used to convert these 3D values into surfaces.

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## 1.166 CLOSING - Closing statements and Disclaimer

Hopefully this document is useful to people out there. Once again, if there is anything you want added/changed/deleted, please [e-mail](#) as listed at the [top of the document](#).

What follows is a small disclaimer so no one gets sued for information that is harmful or accidentally incorrect or misleading. (If you find a mistake...please send [e-mail](#) so it can be fixed!).

Disclaimer: There is no guarantee regarding any information presented in this document. The information may not be correct, useful or helpful. The reader accepts ALL responsibility for actions pertaining to reading this document regardless of consequence.

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## 1.167 Gabriel S.

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|\_\_| \_ \_\_ \_ Wizard signing off  
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## 1.168 Ernesto Poveda Cort s

Hi, my name is Ernesto, This is the 6th FAQ that I convert to amigaguide & html; and i am very proud if it. I also made the guide & html versions of the Fabulous "Dare 2 Imagine" by Shane Davison.

I only put this marvelous doc into amigaguide. Nothing more. The original is from [Gabriel S . .](#)

I want thanks Conny for its support and for having this doc in his home page! Also, I thanks anyone who have it but that i haven't be notified of it :(

For anything you may wish to comment about this production, i can be reached at:

a00448@eps.ua.es ( this addres will be valid until dic 97 )

'THE IML-FAQ#11.'

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