

Don Lancaster's

RESOURCE BIN

number ninety two

Exploring some PostScript possibilities.

Our usual reminder here that the *Resource Bin* is now a two-way column. You can get tech help, consultant referrals and off-the-wall networking on nearly any electronic, *tinaja questing*, personal publishing, money machine, or computer topic by calling me at (520) 428-4073 weekdays 8-5 Mountain Standard Time.

Be certain to frequently check out my new *Guru's Lair* web site you'll find at (where else?) www.tinaja.com This is the place you'll go for instant tech answers. Among the many files in our library, you will find complete reprint sets for all of the *Resource Bin* and other columns. Plus a brand new *Research InfoPack Service*.

You will get the best results if you have both *Netscape Communicator* and *Acrobat Reader 3.0* installed.

Some PostScript Opportunities

The *PostScript* language was first developed by John Warnock of *Adobe Systems*. *PostScript* is a reverse Polish, stack oriented, graphic, procedural, reentrant, resolution independent and dictionary based, device independent, open, job processed, redefinable and interpreted computer language.

PostScript is the second cousin of *Forth*. Three times removed and five times disowned. You can think of it as *Forth* without the religion. Or else as a fanatic-free super *TEX*. *PostScript* is easily learned, lots of fun, and can be an absolute joy to work with.

As a minor and almost trivial side effect, *PostScript* just happens to excel at dirtying up otherwise clean sheets of paper. Thus, *PostScript* has become the industry standard for high quality document publishing. Especially for web publishing, the CD distribution of technical data, and traditional book and magazine workflow control. And anywhere else superb quality and full device independence is a must.

Most people seem to prefer to use

PostScript invisibly buried in such packages as *Acrobat PDF*, *Pagemaker* or *Illustrator*. But the more you learn about *PostScript*, the more you can do with it. And the easier it gets to deal with any problems that may come up. Further, when you *really* start to look at what *PostScript* is and what it can become, the possibilities become truly mind boggling.

This inch square lime graphics box lets you sample some of the flavor of *PostScript* programming...

```
%!                               % header goes here
.8 1 .8 setrgbcolor             % use lime tint
newpath                         % start new graphic
100 100 moveto                  % position on page
0 72 rlineto                    % go up one inch
72 0 rlineto                    % go right
0 -72 rlineto                   % go down
closepath                       % finish box
fill                             % tint box
showpage                        % finish job
```

As you can see, a typical *PostScript* program is an ordinary ASCII textfile. Comments will start with a "%". Each *PostScript* procedure is *first* given all the info it needs to complete its task. This file then gets sent to a *PostScript* speaking device such as a host based interpreter or a printer.

NEXT MONTH: Don looks at some wireless comm developments.

Let's look at some great *PostScript* possibilities that you just might want to explore further...

Adobe Acrobat

A newer simplified "Just the facts, Ma'am" variant of *PostScript* is called *Acrobat*. With an *Acrobat* or a ".PDF" file, only your essential info needed to actually create a graphic or a page is included. *PostScript* can be converted

into *Acrobat* by using *Adobe Distiller* or certain other program generators. Distilled code might be thought of as being "pseudocompiled".

Acrobat often runs much faster and is more compact than *PostScript*.

Acrobat offers several font options. Such as towing the exact needed fonts along internally. Or faking the results as best as possible. A free reader is needed to view any *Acrobat PDF* file. These are available at www.adobe.com or zillions of places on the web. To create your own .PDF files, add links and notes, or otherwise get fancy, you will need the full *Acrobat* package.

Student prices start at \$70.

GhostScript

At one time, there were dozens of imitation clone versions of *PostScript* out there. Whose quality ranged from awful on down to less than abysmal. One version insisted on chopping the tail of *Meowwrrrr*, my *Synergetics Puss de Resistance*.

A shareware version of *PostScript* survives and has finally gotten quite good. This is *GhostScript* from *Alladin Systems*. *GhostScript* is especially well suited to *LINUX* systems. Yes, the full source code is available, but there are commercial use restrictions. You can freely download *GhostScript* through www.tinaja.com/psweb01.html links.

Although quite useful, I very much prefer *Acrobat* over *GhostScript* for my personal professional uses.

Gonzo Utilities

Quite a few years back, I created a sequence of my *Guru Gonzo* utilities which I personally still use to this day for all my graphics layouts and all my *PostScript*-as-language projects. The code provides ultra high quality text justification, hanging punctuation, a sophisticated three stage picjustify, individual kerning control, and great electronic schematic icons.

Combined with my insider secret hyphenation algorithm that you are viewing here.

My Gonzo Utilities are utterly and totally device independent. Er, on the other hand, the utilities are based on certain ancient embedded typesetting commands, are not WYSIWYG and do have a very steep learning curve. The documentation also needs work.

You can sample Gonzo sourcecode when you view any of the .PSL files in www.tinaja.com/muse01.html You can find your Gonzo sourcecode for this column in RESBN92.PSL

More Gonzo utility examples are in the [PostScript Beginner Stuff](#) series.

PostScript and the Web

PostScript's Acrobat utterly, totally, and ridiculously blows HTML away on all counts. First and foremost, you gain absolute and total control over *exactly* what your viewer sees. Often with compressed fast viewing *single* file sizes which average less than 11K per fancy formatted page. Unlimited top quality fonts. With magnification and greatly improved anti-aliasing.

Plus those usual hot linking, notes, and forms capabilities. A simple link verification. And tables in spades.

You also pick up fast downloading through *byte range retrieval*, in which only your required info gets grabbed and presented. Thus, you are viewing the first page while the rest of your doc downloads invisibly.

You do have to work with your ISP to optimize your web presentation of Acrobat files. Activating a byte range retrieval is a must. As is picking one of the many site search engines that can handle both Acrobat and HTML.

Much more on these topics at my www.tinaja.com/weblib01.html

PostScript as Language

The majority of users seem to apply PostScript to strongly graphic "page layout" or "printer description" uses.

But PostScript is in reality a totally *general purpose* computer language. One that holds its own against most any competitor. While solving a wide variety of problems.

The PostScript language generally has *four* possible output formats...

- (1) A visible page layout.
- (2) Recordable text messages.
- (3) Files written to disk or CD.
- (4) I/O control allowed by host.

While little appreciated, PostScript can easily, quickly, and conveniently

read or write disk files in most any format and most any language. This is particularly useful when dealing with ancient dino mainframe files.

Or getting between incompatible formats. Or emulating anything. Or digging really down into web log files to get at the goodies often ignored by commercial reporting software.

Also little known or appreciated is the fact that **the Acrobat Distiller is really a full featured and host based PostScript interpreting computer!**

To use PostScript as a host-based general purpose computer...

- (1) Write commands with an editor.
- (2) Save as standard ASCII textfiles.
- (2) Send commands to *Distiller*.
- (3) Gather up all of your results.

As a simple PostScript-as-language example, suppose we want to find the square root of 35. Using your favorite word process or editor, you enter the following program...

```
%!           % header goes here
35.000 sqrt % find square root
==          % report result
```

Next, carefully save your file as a standard ASCII textfile. Do *not* save in any proprietary word process format! Now send this unformatted textfile to the *Distiller* module of *Adobe Acrobat*. Or use *GhostScript*. The 5.91608 result appears in the distiller message box.

In a "real" use, you would save this result for further calculations, write it to a disk file, or let it help you create a graphic image.

You'll also have the older option of using any genuine PostScript printer as a general purpose computer. This has the advantage of letting you do *crossporting* for real time control. You can also "fill" the printer once and let it grind away all night without tying up your host as well. This works even better when the printer has its own internal PostScript hard disk. More on these *Book-on-demand* applications at www.tinaja.com/bod01.html.

Two way comm is usually required between a host and printer for this option to be genuinely useful. USB, Appletalk, Ethernet, or Serial are the preferred choices. We now have a fast bidirectional parallel option as well.

But note that stock early PC ports went out of their way to keep you from accepting incoming data on their parallel port lines.

Do not try to use any printer-based PostScript-as-language while using one way communications!

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SOME SELECTED POSTSCRIPT RESOURCES

Adobe Acrobat System
1585 Charleston Rd
Mountain View CA 94039
(800) 833-6687
www.adobe.com

Aladdin/Ghostscript
Box 60264
Palo Alto CA 94306
(415) 322-0103
www.cs.wisc.edu/~ghost

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Carlsbad CA 92008
(800) 925-6998
www.techpool.com

Videonics
1370 Dell Avenue
Campbell CA 95008
(408) 866-8300
www.videonics.com

WinBatch
5421 California Ave SW
Seattle WA 98136
(800) 762-8383
www.windowware.com

Download Mechanic, *Transverter Pro*, or that *Adobe Print Driver* have "send file" options that let you use a printer as a general purpose computer.

Some Examples

Let's look at a few of the ways I've used PostScript-as-language to easily solve tough problems. I routinely use raw PostScript-as-language for all of my artwork in all my publications.

Many figures actually do what the artwork suggests. Fractals are fractals, sinewaves are sinewaves, luminosity uses luminosity math, chrominance is chrominance and so on.

You can review the many .PSL files in www.tinaja.com/muse01.html to see exactly how well this works out. I've found PostScript to end up superb for everthing from my ultra high quality schematic diagrams to printed circuit layouts to *Smith Charts* to engineering analysis to [magic sinewaves](#) to math model simulation.

One client came to me for a new standard HDTV video resolution test chart. Besides its extensive detail that had to be exact and easily distributed as a compact multiple-sized file, a lot of hairy hyperbolic math was needed for the expanding resolution lines.

A careful analysis of how close you can fit hyperbolas with PostScript's powerful *Bezier* curves is found as my [HYSPLINE.PDF](#) This is one of many dozens of advanced Bezier files in our www.tinaja.com/cubic01.html library.

A second management consultant client came right out of *Dilbert*. They wanted *dynamically allocated* charting that proactively leveraged their market

driven synergies for central mission statements and interactive responsive programmable matrix techniques.

Really.

Starting with raw spreadsheet and database data out of an ancient dino mainframe. All to the same sheet size, regardless of the number of mission priorities, employees, responsibilities, and such. All in all, rather trivial with raw PostScript.

Here's some PostScript-as-language examples you might explore on your own. These mentioned files and great heaping bunches more all do show up at www.tinaja.com/post01.html...

ALPHADEM.PS	alpha transparency
AWEBUTIL.HTML	pdf web utilities
BODCAT.HTML	automatic catalogs
COLORIZ2.HTML	web auto colorizer
DISKTOOL.PS	PS disk utilities
FUZZYBEZ.HTML	fuzzy curve fitter
GRABREFS.PS	referral log reader
GRABURLS.PS	web link checker
INSERT.PS	insertion sorter
JPEG2PDF.HTML	jpeg ps converter
LINEAREQ.PS	lin equation solver
LINKPDF1.HTML	html/pdf link demo
MUSE89.PDF	Fibonacci sunflowers
PFA2PFB.PS	font conversion util

A reminder: You'll first bring your PostScript-as-language file up in an editor or word processor. Study it and make sure you know what it does and how it is supposed to do it.

Modify your file and save it under a new filename. Then send the file to Distiller or GhostScript to create your needed output results.

More on PostScript-as-language is

in [DISTLANG.PDF](#), [SIXCLICK.HTML](#), and many similar files you'll find at www.tinaja.com/post01.html

A Scripting Combo

At first, PostScript does not seem to be very interactive. It prefers to work in a job mode, processing fixed and pre-entered data. A lot of keystrokes can be involved in entering data and updating screen displays. Both of these problems can be eased by going to a *supervisory controlling program*.

A new scripting language known as *WinBatch* is available through *Wilson WindowWare* at www.windowware.com. *WinBatch* is a potent macro scripting language that gives you automation for Windows or NT.

Using *WinBatch*, a single hot key lets you put source code and object code in two windows on screen at the same time. One click regenerates the images at any time. Often in only a few seconds for all the simpler jobs. Among other benefits, you can keep Acrobat resident in the background rather than having to reboot it all the time. Which ends up much faster and far more convenient.

I'm still in the process of exploring *WinBatch* as a PostScript front end, so I don't have much ready-to-use code just yet. But do stay tuned for future examples. These two working with each other sure look like they will end up as a powerful team.

PostScript Robotics

I like to call any robotic ap that can cut, chew, or spit a *flutterwumper*. Stuff like printed circuit drills, sign

cutters, animation stands, CAD/CAM mills, *Santa Claus* machines and paint robots, hexapods, embroidery setups, and engravers. All of these share those common problems of being able to cut circles or fancy font paths, make very precise size and scaling adjustments, compensate for tool path widths and wear, and possibly having elaborate coordinate transformations.

The PostScript language is ideal to provide such solutions. Especially if ultra low cost is a goal.

The secret trick is to split up your flutterwumper into two parts. You let PostScript do all the really hard stuff on a host computer. While providing for an absolute minimum of PIC level smarts on the device itself. PostScript is superb at writing to most any file or comm format. The industry standards such as *Gerber File Format* or *HPGL* are easily accomodated.

But for those really low end aps, a very simple *meta* language might be used instead. Plain old serial ASCII characters that'll do only the lowest level of fundamental machine steps.

For instance the numeral "0" might mean "go one resolution step to the east. "1" heads to northeast, "2" to north, and so on around till "7" which heads southeast. Other commands might include "H" for home, "U" for pen (or cutter) up, "D" for pen down, "Q" for quit, "R" for repeat, or "X" for a breaking debug tool.

Serial comm speed is more than fast enough for pretty near all mechanical flutterwumper apps.

The beauty of this new PostScript to meta language scheme is that the full power of PostScript, fancy fonts, clip

art libraries, and all elaborate layout tools all are available for you. While keeping your custom flutterwumper parts to a bare minimum.

One ultra low cost printed circuit drill with PostScript robotics potential is made by *Gordon Robineau*. Some further info appears at [MUSE140.PDF](#)

For intro flutterwumping tutorials, [POSTSFLUT.PDF](#), [FLUTWUMP.PDF](#), or [FLUTTOOLS.PDF](#) as openers.

Bunches of links and downloadable files are in my [fluttutterwumper](#), my *Santa Claus*, and *PIC* libraries.

Found respectively at...

www.tinaja.com/flut01.html
www.tinaja.com/santa01.html
www.tinaja.com/picup01.html

For more on PIC's, check *Microchip* and *Parallax*.

Subpixel and Grayscaleing

"Book appliances" and Dynabooks and laptops and whatever are about to blow traditional print magazines out of the water big time. The secret enabling technology centers on new ways of dramatically improving small text legibility. Two of these center on *subpixel* techniques and very precisely *grayscaled* small fonts.

PostScript is a highly useful way to explore or develop these concepts. See [MUSE141.PDF](#) or [STEZINES.PDF](#) for further details.

For More Help

The best way to get started with PostScript is with the "red" *PostScript Reference Manual* and that old "blue" *PostScript Tutorial & Cookbook*. Info is at www.tinaja.com/amlink01.html

Useful PostScript resources include *Enfocus*, *Emerge*, *Image Alchemy*, and *Videonics*. The latter is very strong in video, especially titlers. Lots of links to Acrobat plug-ins can be reached by way of www.tinaja.com/acrob01.html

Some useful newsgroups here are [comp.lang.postscript](#) and [comp.text.pdf](#).

My *Guru's Lair* library pages have PostScript tutorials and examples. Uh, start off using the PostScript library page at www.tinaja.com/post01.html, or else that Acrobat library page found at www.tinaja.com/acrob01.html. Next, try that Flutterwumper library located at www.tinaja.com/flut01.html, and the new Webmastering library you'll find at www.tinaja.com/wewbllib01.html.

My PostScript consulting, training, and seminar services are available per www.tinaja.com/info01.html as well as at www.tinaja.com/consul01.html And including associates with worldwide in-plant capabilities.

Let's hear from you. There's some exciting new possibilities here. ♦

Microcomputer pioneer and guru Don Lancaster is the author of 35 books and countless tech articles. Don maintains his no-charge US tech helpline found at (520) 428-4073, besides offering all of his own books, reprints, and consulting services. Don also offers free catalogs of his unique products and electronic bargains. The best calling times are 8-5 weekdays, MST.

Don is the webmaster of his Guru's Lair found at <http://www.tinaja.com>

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