Travels in TeX Land: Trying ConTeXt

David Walden

ABSTRACT: *In this column in each issue I muse on my wanderings around the TeX world. In this particular column I mainly focus on my initial efforts to learn and use ConTeXt.*

1 The theme of this issue of *TPJ*

In three columns over the past 15 months, I described methods and tools I use to make it easier to draft large documentation projects (i.e., books) and my experience with self-publishing the book *Breakthrough Management.* I believe these columns are essentially on the theme of this issue (TeX for editors), and I refer you to those columns:[1]

- **LaTeX for Productivity in Book Writing** (issue 2006-2)
- **Experiences Refining Page Layout for a Book** (issue 2006-3)
- **The post-typesetting phase of producing a book** (issue 2007-1)

By the way, since the last of these three columns, I corrected dozens of typos and other errors that were found in the first two printings of the book. All of these changes were only a few letters or a few words that dealt only with the errors; no change was made to the substance of the book. Given how much I have heard about how a small change to a TeX file can change the typesetting of many pages, I was pleasantly surprised to discover that almost all of the pagination remained unchanged. In one place in this 280 page book I had to pull an extra line forward a page to maintain the line balance on facing pages, and in one other place I had to change a word to avoid a line overflow.

Thus, in this column I am going to report on something other than the theme of this issue, namely, on my first attempt to use ConTeXt.

2 Trying ConTeXt

I have known about ConTeXt for the past several years, but never tried it out. I got more interested in ConTeXt a couple of years ago doing **my interview of Hans Hagen**, the creator of ConTeXt but still did not try it. After typesetting my book with LaTeX last year (see my columns mentioned in section 1), I got more interested in ConTeXt, particularly its ability to typeset on a grid that Hans had mentioned.[2] Consequently, after putting my column for

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[1] All of the blue (on a display or color printer) words in the following are hot links to various URLs.

TPJ issue 2007-1 to bed, I decided to try ConTEXt, and I describe that experience in this and following sections.

But first, I must apologize for my hit-and-miss approach to finding out things about ConTEXt (as described below) rather than systematically reading a manual. However, this tends to be my approach to learning something new (albeit perhaps quite inefficient). I suspect that many other people approach a new system in a similarly unsystematic way; perhaps by reading my experience they will be encouraged to try their own ad hoc path to facility with ConTEXt.

I started by printing Steve Peter's two columns on ConTEXt in the 2005 issues of *TPJ*:

- `starttext % Practical ConTeXt`
- `starttext % Practical ConTeXt:` **ConTeXt Text Editors**

Then I executed Steve's "hello world" example.

Next, I looked at Joe Hogg's paper in *TPJ* issue 2006-3:

- **ConTEXt Starters**

I printed out his example letter and looked at his ConTEXt file for the letter.[3] I created a skeleton letter from those examples and cut-and-pasted the text of a letter I had drafted in Word into the body of my skeleton ConTEXt letter. I looked up a few needed commands in Han Hagen's 370-page **ConTEXt manual** (which I had printed out a year ago but not looked at since). For instance, I found the following pair of commands in the manual:

```
\startitemize ... \stopitemize
```

Thus, I was able to do basic formatting of a four page letter. (An expurgated version of the source text file for the letter is available as `eic.tex` on the HTML page for this paper, along with the resulting output (`eic.pdf`). I make no claims that the formatting of this letter is good quality ConTEXt markup; it is only what I was quickly able to pull together.) That part seemed easy enough, taking a couple of hours not counting refining the content of the letter. Of course, already knowing TEX cut out lots of learning someone would have to do who started from scratch with ConTEXt.

This first try of mine of ConTEXt had defaulted to producing dvi output which I converted to a PDF by clicking the dvi-to-pdf icon in WinEdt, the editor I use. So I tried looking at the ConTEXt Garden, the **wiki for ConTEXt**, to which Steve Peter's paper had directed me, but I didn't find anything there immediately (although it looked like there was a lot of good stuff there such that I should keep this website in mind for answers to future questions). I next opened the **TeXEXEC explained** manual I had printed out at the same time as the ConTEXt manual a year ago, and there on the second page it told me about including the PDF switch in my command line to compile a ConTEXt file:[4]

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[2] Also, the **LuaTEX** efforts, which seem to be an important center of future TEX evolution, involve Hans Hagen and other people deeply involved with ConTEXt. Thus, it seems likely that eventually I will be drawn into these guys' orbit, e.g., to obtain the benefits of LuaTEX when it is available, an my curiosity would probably also lead to me trying their ConTEXt system; so I might as well start getting familiar with ConTEX now rather than later.

[3] Also included with Joe's paper is an example of the ConTEXt for a four-page brochure.

[4] Since initial publication of this column, Mojca Miklavec has suggested that I don't have the latest version of `texexec` on my computer and that a PDF file is now the default output of `texexec`.

```
texexec --pdf file-name
```

I decided I wanted some hot links for URLs in my letter, so I looked up a ConTEXt source file of Joe Hogg's example letter that appeared as part of his contribution to issue 2006-3 of *TPJ* (`http://www.tug.org/pracjourn/2006-3/hogg/`) and saw how he defined hot links

```
% Enable colors and activate hyperlinks
\setupcolors [state=start] \setupinteraction [state=start, color=blue]
\definecolor [darkRed][r=.5,g=.0,b=.0]
\useURL[JCQM][{http://www.cqm.org/journal}][]
          [{\it Journal of the Center for Quality of Management}]
```

and later referred to them with

```
\from[JCQM]
```

Then I tried to change the font and could not figure out how to do it. I subscribed to the ConTEXt discussion group (`ntg-context@ntg.nl`) but (through no fault of the discussion group) didn't get any farther very quickly. So I gave up. I decided to come back to ConTEXt sometime later when I had a substantial project that required ConTEXt and thus it would be worth spending the time to figure out how to configure ConTEXt properly.

An aside: I wish I could focus on the complexity of the typesetting system (e.g., ConTEXt, as in this column) or the new programming language or whatever else I am trying to learn rather than on configuring the application software package to run on my computer system. This is a frequent bother with using open source or free software. Of course, commercial software also often has similar problems, e.g., having to learn a development environment when all I want to do is use the compiler, editor, or word processor. In all cases I long for software packages that just work without complicated downloading, installation, or configuration; I don't really mind complexity, but I wish I only had to deal with it in the area I am actually trying to work in.

3 Back to ConTEXt and fonts

A month later, I fumbled around for a few minutes at a time on and off for a couple of more days, until I found Bill McClain's ConTEXt beginners page and its section on **Selecting Fonts**. I used his simplest method

```
\font\myfirstfont=bchb8r
\myfirstfont
```

to switch my earlier letter into CharterBT-Bold which for the first time gave me some comfort that my ConTEXt configuration was not broken. (When one tries something for the first time and it doesn't work, it's hard to know whether it is one's own error and lack of understanding or if the never-tried-before system doesn't work right.)

I next tried the following by McClain which he calls "A simple example." He says he has the following fonts on his system:

```
bchr8r  roman
bchb8r  bold
bchri8r italic
bchbi8r bold italic
```

So, he created the following typescript file, named `type-charter.tex`:

```
\usetypescriptfile[type-buy]

\starttypescript [serif] [charter] [8r]
  \definefontsynonym [Charter-Roman]       [bchr8r]  [encoding=8r]
  \definefontsynonym [Charter-Bold]        [bchb8r]  [encoding=8r]
  \definefontsynonym [Charter-Italic]      [bchri8r] [encoding=8r]
  \definefontsynonym [Charter-Bold-Italic] [bchbi8r] [encoding=8r]
\stoptypescript

\starttypescript [serif] [charter] [name]
  \usetypescript[serif][fallback]
  \definefontsynonym [Serif]           [Charter-Roman]
  \definefontsynonym [SerifBold]       [Charter-Bold]
  \definefontsynonym [SerifItalic]     [Charter-Italic]
  \definefontsynonym [SerifBoldItalic] [Charter-Bold-Italic]
\stoptypescript

\starttypescript [Charter]
  \definetypeface [MyCharter] [rm] [serif] [charter] [default] [encoding=8r]
\stoptypescript
```

And he called it like this:

```
\usetypescriptfile[type-charter]
\usetypescript[Charter]
\setupbodyfont[MyCharter]
```

I did that and it worked for me too. Apparently I also have the bchr8r, bchb8r, bchri8r, and bchbi8r fonts on my system.[5]

Nonetheless, I put aside figuring out more deeply how to use fonts in ConTEXt. I'll come back to that after I know a little more about ConTEXt in general. In the meantime, I have printed out copies of two papers from issue 2005-2 of this journal that relate to using various fonts with ConTEXt, for when I am sure I will need them later:

- **Integrating TrueType Fonts into ConTEXt** by Thomas Schmitz
- **OpenType installation basics for ConTEXt** by Adam T. Lindsay

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[5] Yuri Robbers says that these fonts come with almost any TEX installation—I live and learn.

4 Writing a non-trivial document in ConTEXt

To get more experience with ConTEXt, I decided to try to write this column in ConTEXt. The final source file is listed on the HTML page for this paper with the title `walden.tex`; this PDF file you are reading is the output. I don't claim to use good ConTEXt style (yet).

I had some notes for this column (although nothing yet for this section) in a plain text file that had a few LaTeX commands mixed in with a lot of text without required markup. I changed the extension of this file from `.txt` to `.tex` and compiled the file over and over with ConTEXt, looking up stuff on ConTEXt as needed until the file completely compiled. For instance, I found `\starttyping` and `\stoptyping` for displaying verbatim commands by Googling on "Context verbatim" which led me to the **Verbatim text** page of the ConTEXt Garden wiki.

However, after an hour of such hit and miss looking up of needed commands, I decided I needed to actually read (or at least skim over) one full document on ConTEXt; and I did thumb through and glance at every page of **ConTEXt an excursion**.

In the "excursion" I found:

- `\subject` as an alternative for `\section` when no section number is wanted, as for the Acknowledgments and Biography sections of this paper

- that by commenting out the command `\setupwhitespace[medium]`, which I had used in my letter from which I started formatting this column, I eliminated the between paragraph vertical spaces the letter used by that were inappropriate for this column

- the commands

      \startnarrower ... \stopnarrower

  for having the paper's abstract be narrower than the full text block size

- that the `\footnote` command looked the same as in LaTeX (when used without ConTEXt's optional label field)

At this point, I decided to try to match somewhat the standard LaTeX formatting for *TPJ* papers. I put the journal issue number at the top left of the first page with the revision date below it. I switched the title and author lines from `\midaligned` to `\leftaligned` and made them bigger using ConTEXt's `\tfb` and `\tfc` type-sizing commands. I was also excited to find that the command `\currentdate[year,--,mm,--,dd]` results in a date in the format 2007–06–19. (Just changing the argument of the command results in a different format, e.g., `\currentdate[day,month,year]` results in 19 June 2007.) In general lots of ConTEXt basic commands seem to have more useful optional formats than LaTeX's basic commands have, options that one often has to load a separate package to obtain in LaTeX. For instance, `\section{Title words}` has an optional argument, e.g., `\section[secfoo]{Title words}`, such that the section can be cross-referenced with as in `Section~\in{secfoo}`.

Then it occurred to me that perhaps there were documents somewhere that helped LaTeX users (like me) switch to ConTEXt. I Googled around and found two resources:

- A web page at the ConTEXt Garden titled **From LaTeX to ConTeXt**
- A document by Berend de Boer titled **LATEX in proper ConTEXt[6]**

In the second of these, I found the version of \startitemize that uses numbers rather than bullets, such as for the list in Section **7** of this column. I should have searched earlier for these documents.

Although my column doesn't usually involve images, I wanted to try one in ConTEXt. In the ConTEXt manual I found the following commands, which I used for the bio section at the end of this column:

```
\placefigure[left]{none}{\externalfigure[dave-head.pdf]}
```

So now I have this column in its current state (without what follows this section). It wasn't so hard—only a few hours once I settled into working on it.

5 Trying a bit of math

My writing typically includes almost no math. However, I wanted to try math in ConTEXt, and on pages 1–2 of my **unpublished note on the history of dynamic routing algorithms** (written using Peter Wilson's Memoir class) is the following LATEX code for a bit of math:

```
\begin{eqnarray}
&x_{i} + l_{ij} \ge x_{j}&\\
&x_{0} = 0&\\\
&\mbox{maximize}\qd{}x_{n}&
\end{eqnarray}

\noindent{}where $x_{i}$ is the current approximation of the distance
from the source node 0 to destination $i$ and $l_{ij}$ is the length
from node $i$ to node $j$.  He next turns inequality 1 above into the
inequality,

\begin{equation}
x_{i} - x_{j} \ge l_{ji}
\end{equation}
```

To typeset that in ConTEXt, I changed it as follows, using some commands for formulas that I found in **ConTEXt an excursion**:

```
\def\MYformula#1{\placeformula \startformula #1 \stopformula}
\setupformulae[location=left]
\placeformula \startformula x_{i} + l_{ij} \ge x_{j} \stopformula
\vskip -.3in
\placeformula \startformula x_{0} = 0 \stopformula
```

[6] A version of this document was also published in *MAPS* 24, 2000, pp. 65–92—an issue of the journal of the Dutch TEX Users Group (NTG).

```
\vskip -.3in
\placeformula \startformula \mbox{maximize}\ x_{n} \stopformula

\noindent{}where $x_{i}$ is the current approximation of the distance
from the source node 0 to destination $i$ and $l_{ij}$ is the length
from node $i$ to node $j$.  He next turns inequality 1 above into the
inequality,

\placeformula
\startformula
x_{i} - x_{j} \ge l_{ji}
\stopformula
```

That is pretty brute force, and there is undoubtedly a better way to handle three equations in a row and make them be single spaced. Or maybe math typesetting is a little harder in ConTEXt than in LaTeX; I'll have to do some more studying to find out.[7] In any case, my little bit of ConTEXt for math produced the following display relating to the Bellman-Ford algorithm:

$$x_i + l_{ij} \geq x_j \tag{1}$$

$$x_0 = 0 \tag{2}$$

$$\text{maximize } x_n \tag{3}$$

where x_i is the current approximation of the distance from the source node 0 to destination i and l_{ij} is the length from node i to node j. He next turns inequality 1 above into the inequality,

$$x_i - x_j \geq l_{ji} \tag{4}$$

6   ConTEXt and MetaPost

I had tried writing and calling a trivial MetaPost program a number of years ago. While I managed eventually to draw a circle or whatever, I found the process of naming the MetaPost output file, calling the file from LaTeX, etc., quite confusing, and never tried again... until now.

Somewhere I had read that MetaPost was the native graphics capability of ConTEXt and was highly integrated with ConTEXt. So I decided to give MetaPost another trivial try to see if it was more natural to use MetaPost from within ConTEXt. I Googled on "MetaPost Context" and found the **MetaFun** page of the ConTEXt Garden wiki. I clicked there on the **MetaFun Manual**.[8]

Somehow I quickly stumbled onto page 323 of the Hans Hagen's 364-page MetaFun Manual where I saw the following:

```
\startbuffer[dummy]
draw fullcircle
xscaled 3cm yscaled 2cm
```

---

[7] Since initial publication of this column, Mojca Miklavec has directed me to a **a relevant document**.
[8] A manual of MetaPost macros that also describes MetaPost in considerable detail.

```
rotatedaround(origin,30)
withcolor .625red ;
\stopbuffer

\startlinecorrection[blank]
\processMPbuffer[dummy]
\stoplinecorrection
```

That seemed pretty straight forward, so I tried it and it worked. Wonderful! So much easier already than my previous attempt to use MetaPost.

I looked for a slightly fancier bit of MetaPost code and found some on pages 257–258 of the manual:

```
def spring (expr a, b, w, h, n) =
( ( (0,0) -- (0,h) --
for i=1 upto n-1: (if odd(i) : - fi w/2,i+h) -- endfor
(0,n+h) -- (0,n+2h) )
yscaled ((xpart (b-a) ++ ypart (b-a))/(n+2h))
rotatedaround(origin,-90+angle(b-a))
shifted a )
enddef ;

z1 = (+2cm,0) ; z2 = (0,+2cm) ;
z3 = (-2cm,0) ; z4 = (0,-2cm) ;
pickup pencircle scaled 1.5pt ;
drawoptions (withcolor .625red) ;
draw spring (z1, z2, .75cm, 2, 10) ; draw z1 -- 1.5 z1 ;
draw spring (z2, z3, .75cm, 2, 9) ; draw z2 -- 1.1 z2 ;
draw spring (z3, z4, .75cm, 2, 8) ; draw z3 -- 1.5 z3 ;
draw spring (z4, z1, .75cm, 2, 7) ; draw z4 -- 1.1 z4 ;
```

I put that code between the \startbuffer and \stopbuffer commands shown above, and embedded the \processMPbuffer command in a \midaligned command and it produced the following:
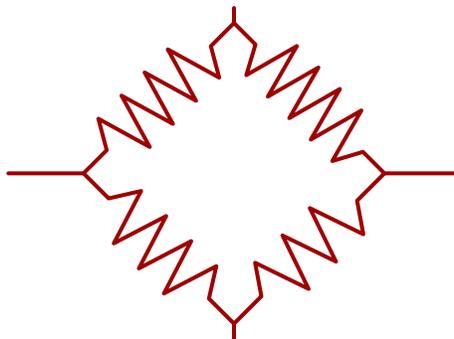
Pretty easy.

7 Current thoughts on ConTEXt

Having tried ConTEXt to the limited extent described above, I have a few opinions on it versus LATEX. (The following is in two columns only because I wanted to try the `\startcolumns[n=2]` and `\stopcolumns` commands.)

1. It will take a while to get used to not having as much default document formatting as exists in the LATEX classes such as `book` and `article`. I assume many people have implemented their own versions of such classes for ConTEXt but so far I have not found an archive of them that new users can use as is or adapt to their own needs. (One can see lots of example source code via the **Sample documents** page of the ConTEXt Garden wiki. I find this to be is a particularly useful way to learn things about ConTEXt. For instance, I noticed in one source file that `\CONTEXT` appears to be built into ConTEXt as an alternative to `Con\TeX{}t`.)

2. It will take a while to get used to the large ConTEXt command set that is new to me.

3. There is a massive amount of **ConTEXt documentation** available. For instance, there appear to be 41 separate manuals related to ConTEXt at `Pragma-ADE.com` (with interactive screen-based versions available for at least a few of them). There is the extensive ConTEXt Garden wiki. And there are other ConTEXt websites.

   However, I find it a little hard to find my way around all this document. Patrick Gundlach (of the ConTEXt Garden) apparently somewhat agrees with me and has written a sort of **mission statement** explaining his documentation augmentation project. There also appears to be no single tutorial book such as Kopka and Daly's *A Guide to LATEX* and no single reference work parallel to the *The LATEX Companion* by Mittelbach et al.

   Making things still harder for me is that the documentation often seems a little cryptic. For instance, the ConTEXt Gar-

den wiki has a substantial page on page layout including setting up headers and footers, and the ConTEXt manual has a substantial section on headers and footers in its layout chapter; however, neither or these made it clear to me how to have a different footer on the first page of a document. In fact, I couldn't even find a description of the command description syntax that the manual uses. Through trial and error I eventually found something that worked, but even having working code did not make the header and footer documentation clear to me.

Clearly it will also take a while for me to get used to ConTEXt's documentation.

One of the purported reasons for there being less than definitive documentation for ConTEXt is that the system changes fast—for instance, in response to user requests. Of course, rapid accommodation of user needs is desirable in many ways.

4. Some things seem easier or better in ConTEXt than in LATEX; for instance, adding an image with the text flowing around it (as shown in the Biographical note below) was trivial in ConTEXt, and I could never be bothered with figuring out how to do this in LATEX (no doubt there is a package that provides this capability). Another example: I noticed while creating a footnote that ConTEXt apparently can handle verbatim text in footnotes simply using `\type`. (As I remember, a `\verb` in a LATEX footnote requires special handling different than when it is used in the main text.)

5. While I have not dug really deeply into ConTEXt yet, it looks like ConTEXt will automatically do a better job of some

things that are important to me, such as having the bottom lines of facing pages match. There also appear to be a bunch of non-TEX utilities that are integrated with ConTEXt that are going to be very useful as I learn to use them.

6. Being able to just include lines of Meta-Post in a ConTEXt file seems quite wonderful. (More generally, the `texexec` program apparently does a lot of stuff for the ConTEXt user that I don't fully grasp yet.)

7. ConTEXt is not as well integrated out of the box with my editor, WinEdt, as LATEX is. It is a slight bother having to run ConTEXt in command line mode in parallel with editing with WinEdt rather than just clicking a button in WinEdt to compile with ConTEXt. (I should be able to configure WinEdt to have such a ConTEXt button, but can't be bothered to do so.)

With this much learning and use of ConTEXt under my belt, I feel like I am over some hump and well on my way with ConTEXt and will surely use it again for a bigger project in the near future.

All in all, I am impressed with ConTEXt. Also, its approach of being more like Plain TEX than LATEX in terms of not assuming much logical document structure fits well with my personal inclinations. However, the next time I must definitely figure out how to use ConTEXt's various capabilities for structuring and reusing the components of a document. That—and how to use different fonts with ConTEXt—will be my top learning priorities.

[This column continues on the next page]

Appendix: Grid experiment

Just for fun, I included a `\showgrid` command, just before the title line for this appendix. I also included a `\page` command so the grid wouldn't obscure my concluding remarks to the previous section. This capability would be useful if I wanted to work harder at improving the vertical spacing of the photo and text in the biographical note.

Acknowledgements

I greatly appreciate the efforts of the authors of the various pieces of ConTEXt documentation I mentioned in the body of this column. I drew particularly heavily from Bill McClain in Section **3**.

Karl Berry reviewed a draft of some parts of this column and caught a number of typos. Yuri Robbers reviewed the full draft and provided many useful suggestions for improvement. Issue editor Paul Blaga and editor-in-chief Lance Carnes spotted typos.

Biographical note

David Walden is retired after a career as an engineer, engineering manager, and general manager involved with research and development of computer and other high tech systems. The photograph at left is from when he was considerably younger and not as in focus as he is now. More history is at **www.walden-family.com**.

As mentioned near the end of Section **4**. the photo was placed here using `\placefigure[left]{none}{\externalfigure[dave-head.pdf]}`.