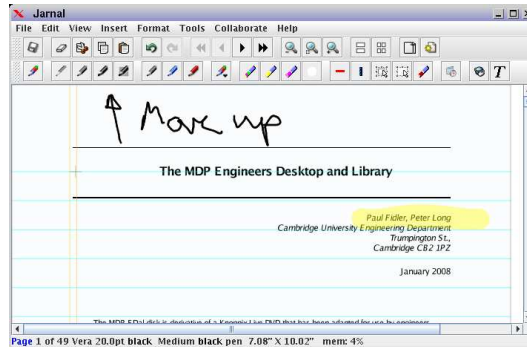


Jarnal

Page mark up and collaboration system



1 Syntax

`java -jar jarnal`

2 Getting Started

Writing tools There are four basic kinds of writing tools - the pen, the transparent and translucent highlighters, and the bottom highlighter. Writing takes place at the top of the screen. That is, whatever you write covers whatever was already written. With highlighters, this probably isn't what you had in mind. So you can use transparent or translucent highlighters that allow what is underneath to show through. There is also a "bottom highlighter" that writes at the bottom of the screen, underneath whatever was already written. Since the bottom highlighter does cover the background, there is also a toggle to make that transparent or translucent as well.

Tools can have ten different colors and four widths (Fine, Medium, Heavy and Fat). You select your tool using the Tools — Pen menu - the highlighter style menu lets you set which type of highlighter you want to use. There are also some buttons for changing writing instruments quickly. After all this intense effort choosing the perfect writing instrument, you might like to save it. You do this by choosing Tools — Pen — Set Default. If your current writing instrument is a pen, this will set the default pen; if your current writing instrument is a highlighter, this will set the default highlighter. These default instruments can be set by Tools — Pen — Default, or more likely by pressing the pretty multicolored button for the default pen and default highlighter.

The whiteout is a white fat pen. The razor and select tools enable you to move things around; the ruler draws straight lines; the eraser erases individual strokes. User configurable options are kept in the .jaj file, and are restored when the file is opened. Text mode enables you to create new text regions and change their width by clicking (and dragging). You may select various text features; if you choose set default text from the format menu, this chosen text characteristics will be applied to any new text regions you create. Context menus allow rapid choice of tools and other options. You can cut, copy and paste things. The part that is not obvious is how this works with pages. To select a page make sure you are not in text mode and use the select tools to select nothing. If the page is selected the word "Page" in the status bar will turn blue.

Paper You write on paper. On the Format menu are a splendid variety of options for what type of paper you would like: what color, how many lines, index cards, or whatever. You can also have backgrounds, which are graphic images that appear underneath everything else. Bookmarks: are akin to most recently used files. There is no limit on how many bookmarks can be remembered, and they can be deleted. Servers used for collaboration are also bookmarked.

User Info bookmarks, server bookmarks and network save options (except prompt-ForNetSaveName and URLEncode) are considered user information. You may choose whether or not this information should be save in the .jaj file. The default for any new file is not to save user information.

Transparency Bottom highlighters can have three levels of transparency: opaque, translucent or transparent. This is set on a per page basis; if you are annotating background image files, you will probably want to make your highlighters transparent so you can see the background through them. Or just use the transparent and translucent highlighter, which draw at the top of the screen.

Color Trapping The color trap dialog enables you turn turn on and off specific colors on the current page; be sure to hit Redraw Page to see the changes. This is useful if you are collaborating and assign different collaborators different pens; you can then easily see what different people did, without seeing them all. To assist in this, you can import a file mapping colors to names that will then be visible in the color trap dialog. Thanks to Peter J. G. Long for suggesting this.

Image Insertion From the Tools menu choose Insert Image, pick an image then click to place it on the page. You can resize it in text mode by clicking and dragging. Also clicking on an image in text mode puts in on the clipboard where you can paste copies of it it using Tools — Paste Image.

3 Collaboration

Collaboration between different machines is supported. Open a document on one machine and choose Start Server from the Collaborate menu. You may choose which port the server binds to; if you will accept any available port, choose port 0. The port used will be displayed in the status bar. Then from the same or another machines, open a document and choose Connect to Server from the Collaborate menu, or choose a bookmarked server. Enter the name or ip address of the server in the dialog box, you may include a port as in localhost:1189. If you do not specify a port, the default port 1189 will be used. You may connect as many clients as you like. Initially the GUI's of all of the collaborating windows are locked. To make changes, you must request control of the document using the Request Control button; once you have control, you may use the button to Release Control. Only one person at a time may have control. Changes made on the controlling document are reflected in real time on the collaborating documents. If the server has control of the document, client connections are blocked until control is released; when client connections are being requested, the Release Control button on the server turns yellow.

3.1 Limitations

- If the server has control of the document and a window running on the same java thread as the server (for example, opened by choosing New from the File menu) attempts to connect, Jarnal will deadlock.
- If a document is changed prior to a client connecting, the client will not be able to handle all of the undo/redo operations available to the server and other clients. If an undo/redo is performed that is not available to a client, the client is automatically disconnected, and should retrieve the modified document by reconnecting.

4 Networking

Jarnal supports retrieving files to and from webservers. Files loaded at startup may be specified as URLs starting with http://. Jarnal will attempt to download the requested file using http, and will save the result locally as a temporary file and open it. Background files, metadata files, template files and .jaj files may all be accessed using http. The use of metadata files (see the startup documentation) is especially recommended for loading over the network, as these are designed to be generated by the server on the fly and provide pertinent information, such as how to send data back to the server.

Network Save Saves file to a webserver. Note that the functionality provided is equivalent

to submitting a form - the backend capability of processing the form data must be provided separately.

1. Choose Network Save Options from the File menu.
2. Set the server to the page that will receive the file upload in the first box. For example `http://www.dklevine.com/workshops/testup.php3`
3. Set the variables that will be transmitted in the bottom box. Each variable is entered on a separate line in the form `variable_name=variable_value`. For example

```
account=george
password=monkey
infile=$$jarnal
```

When you choose Network Save from the File menu, this will result in the jarnal file you are editing being uploaded under the name `infile`, and additional variables named `account` and `password` being uploaded with values set equal to `george` and `monkey`. If the server returns information, you can view it by choosing Show Server Message from the file menu; this information is also echoed to the console, if you have started Jarnal from one.

4. In place of a fixed `variable_value` such as `george`, you can use special values beginning with `$` to represent internal values from Jarnal. Supported variables are

`$$jarnal` the contents of the jarnal file

`$$snapshot` a jpg file with a snapshot of the current page of the jarnal file

`$$pdf` a pdf file with the entire jarnal file printed according to print options

`$f` the local name of the jarnal file or `unsaved.jaj` if the file has not yet been saved locally; when using `multipart/form-data` it is this parameter that is passed as the filename not `$g`

`$p` fully qualified pathname of the jarnal file

`$n` number of pages in the jarnal file

`$u` a unique identifier, guaranteed not to change as long as the file remains open and is not saved under another name; can be used so that the server can identify the same file being repeatedly saved

`$g` the network save name suggested by the user

5. To perform the upload choose Network Save from the File menu; when running as an applet you can also use the Save button.

ing Network SaveWith Java Servlets Data uploaded to the server is by default uploaded as binary `multipart/form-data`, that is as MIME. Java servlets do not decode MIME, they expect

POST data to be urlencoded. There is a network save option URLEncode that you can check, or provide in a metadata file, that will force Jarnal to upload using urlencoding. The variable representing the file will be filled with a (rather long) ascii string consisting of base64 data which you must then decode to get the file. There is an undocumented urldecoder that ships with Java that you may wish to use to decode. The Jarnal source code also contains a public source urldecoder from Robert W. Harder in the Jtools.java file. An alternative (thanks to Walter Yuan for this) is to get the com.oreilly.servlet package which supports multipart decoding. You should easily be able to locate the package using google. You can then use it to decode the default MIME uploaded by Jarnal. This is the recommended method, since base64 encoding both adds overhead and significantly increases the number of bytes that must be transmitted. Here is Walter's source code for a sample servlet showing how to use the com.oreilly.servlet package; it accepts MIME encoded upload and echoes them back to the user.

Sample PHP Backend Application This small application enables you to dedicate a directory in which to store network accessible .jaj files, and create and save new ones. When called without any parameters, it will show you a list of files in the directory, plus the option of creating a new file. Clicking on a file will load the file into Jarnal, and set network save parameters so that when the file is saved by clicking on the Network Save button or choosing Network Save, it replaces the original file, or in the case of a new file, will prompt you to give the file a name. Reloading the original list in your browser will show a list with the new file. Please note that this sample application provides no security whatsoever: if you use it, anyone in the world who can access this application can access your .jaj files.

1. Create directory accessible to your webserver to keep your .jaj files in.
2. Put the file template.jaj, editing it if you wish, in that directory. template.jaj will prompt for a name on network save and the save button is set to do a network save.
3. Edit the PHP source file to point it to the appropriate directories and files, as indicated in the source code.
4. Place the PHP source file in a directory on your webserver from which PHP scripts can run.
5. Make sure that you have associated the mimetype application/jarnal-meta with `java -jar jarnal.jar -m`

5 Annotation and Background Files

Background image files can be loaded, either to serve as a decorative background, or for purposes of annotation.

A background image file can contain a single or multiple images. Files containing multiple images include a zip file containing single image files, multi-page tiff files, and pdf files. Multiple background files are supported. Opening a background file has one of two effects depending on whether the current page has a visible background or not. If the background is visible, the opened file replaces the existing background. If the background is not visible, the opened file is added to the existing backgrounds, the current page is assigned the first page of the background and pages are added for the remaining pages of the background. Backgrounds may either be repeating or non-repeating. With repeating backgrounds, additional pages beyond the end of the background repeat the original background. By default single image files are repeating, multi-image files are not.

You can toggle background images on and off on a per page basis from the paper menu. You may either use external background files, with the path to the background file stored in the jarnal file, so that when the file is reopened so will the background images (if they haven't been moved), or you may store the backgrounds directly in the .jaj file. If you are collaborating, and your collaborators do not have the external file in the same location in the file system, be sure to choose the store background in file option. You may find annotate.jaj useful as a template for annotation. It sets the paper to plain, size fit to background and transparency to translucent.

A key function of Jarnal is the ability to annotate pdf files. This is done using the JPedal libraries. The libraries consist of two parts - a GPL portion - jpedalt.jar and a proprietary version pjes.jar - that supports embedded fonts. Please be aware that the proprietary part is not released under the GPL and is available for non-commercial use only. For commercial use with Jarnal or for any other commercial use, please purchase the license. I would also like to express my gratitude to Mark Stephens for making the excellent JPedal available under the GPL and pjes.jar freely available for non-commercial use - as well as his patience in helping to get the JPedal libraries to work well with Jarnal.

What types of images are supported? jpg, png and gif files are always supported. Support for fax (tiff) and pdf files are optional. Many ways of providing support are possible. The table below gives the recommended installation instructions.

	fax	minimum pdf	maximum pdf
windows	install the jai	install jpedal	windows maximum pdf
unix including linux, mac	install the jai	install jpedal	unix maximum pdf

6 Install the JAI

Sun provides the JAI add-on with support for additional graphical formats including multi-page tiff for faxes and ppm files used with xpdf for pdf support on unix systems. For Linux and Windows go to <http://java.sun.com/products/java-media/jai/> and download and install JAI for your platform. For the Mac go to <http://www.apple.com/downloads/macosx/apple/java3dandjavaadvancedimagingupdate.html>. Note: there seem to be two JAI's to install - the connection between them is not clear to me. Make sure to install the "JAI Image I/O API" along with the JAI itself.

7 Install JPedal

Download jpedallib.zip. Find the directory containing your jarnal.jar file. The files in jpedallib.zip should be placed in a subdirectory called lib. Note that jpedallib.zip already has a subdirectory with this name, so make sure the files don't end up in lib/lib. With minimum support installed you will be able to annotate pdf files, view information about the pdf file and you can print to pdf files. You cannot work with text in pdf files.

8 Windows Maximum PDF Support

Install Jpedal. Run Jarnal and examine the about box, noting down what it reports your home directory is; under windows it tends to be in an obscure location. Go to that directory and edit the file jarnshell.conf with a text editor. In the line

```
pdftotext=pdftotext -eol unix -layout -f %1 -l %2 %3 %4
```

edit it to read

```
pdftotext=$lib  
pdftotext -eol unix -layout -f %1 -l %2 %3 %4
```

where \$lib should be replaced with the path to the lib directory in which you unzipped the jpedal files.

[Instructions that are superceded by the new version of Jpedal] Go to the ghostscript site and download and install ghostscript for windows (not ghostview). Run Jarnal and examine the about box, noting down what it reports your home directory is; under windows it tends to be in an obscure location. In the line

```
pdfrenderer=pdftoppm -f %1 -l %2 -r %4 %5 %3
```

edit it to read

```
pdfrenderer=$path_to_gsgswin32c -dNOPAUSE -dBATCH -dTextAlphaBits=4  
-dFirstPage=%1 -dLastPage=%2 -sDEVICE=png16m -sOutputFile=%3 -r%4 -f %5
```

where \$path_to_gs should be replaced to the path to the directory that contains the gswin32c executable installed when you installed ghostscript.

9 Unix including Linux and Mac Maximum PDF Support

Install Jpedal. Install the JAI. Install xpdf if it is not already installed. Xpdf ships with most linux distributions, but may not be installed by default. For example, in an rpm based distribution, locate the xpdf rpm and install it. If xpdf is not shipped with your distribution, go to the xpdf website to download and install it.

10 Handwriting Recognition

The pen, but not the highlighters support handwriting recognition. ONLY PRINTED CHARACTERS ARE SUPPORTED, not script, cursive, or any sort of handwriting where the letters are all connected together. You can either recognize all handwriting on a page Tools — Recognize Page or you can turn on the recognition engine Tools — Recognize. Recognized characters are typed in the most recently selected text box. Jarnal comes with a small dictionary of lower case Latin letters; you can build your own dictionaries to add to this, or replace it. User dictionaries are called jarnal.recog and must be located in your home directory. If you aren't sure where this is, take a look at the Help — About box in Jarnal.

Other Options On the Tools — Recognize Menu you can clear the recognition dictionary (to start over), you can Undo Recognition (also available from the Context Menu — Type — Undo Recognition) or you can enter training mode to build your recognition dictionary. Undo recognition works a little better than simply hitting the undo button when in recognition mode: it undoes the last letter recognized and all the strokes that went with it, plus it reinitializes the recognition engine properly.

Building a Recognition Dictionary When in training mode, any stroke that is not sufficiently recognized causes a dialog box to pop up. You type what it is you are trying to write in this box. Note that you are not limited to single characters; if you are ambitious you can build an entire system of shorthand, where single small strokes write entire large sentences.

How it Works (or Doesn't) Each stroke is normalized to a common scale (so a very large B looks the same as a very small B). Then a whole bunch of different methods are used to try to determine which stroke/strokes in the dictionary match whatever you are drawing, and they are averaged together to get a score. Then a table of probabilities of pairs of letters is applied to guess, for example, that if the previous letter was a q, the next letter probably isn't going to be an x. (The mini-Jarnal does not do this guessing or spacing - see below.) Spacing is handled by seeing how far apart you drew your letters, and also using the table of letter pairs - it turns out, for example that in formal writing at least, few English words end in the letter i, so if you try to write hi, you may find the results surprising. The table of pairs is contained in images/pairs.txt in the Jarnal.jar file - and it can be replaced by another table. Here is a PHP script that reads a text file in the same directory called "sample.txt" and writes (to the screen) the corresponding table of conditional probabilities. So use `php -q analyze.php <pairs.txt`, to get your pairs.txt file. Feel free to replace the existing pairs.txt with your new one. The default table was generated by downloading from Gutenberg a subset of their most popular books meeting certain criteria, such as having been originally written in English and being available in ascii format, sticking them together in a large file called sample.txt and running analyze.php. The books actually used were Ulysses, Relativity: the Special and General Theory, The Adventures of Sherlock Holmes, and The War of The Worlds, which should be random enough for practically anyone.

Source Code The source is Janalyze.java. This has no dependencies on any other part of Jarnal, so can be dropped into any other project by simply changing the first line of the file to reflect the correct package. However, I haven't documented the API yet, so you'll have to guess this by reading the code.

The mini-Jarnal if you open Jarnal from the command line with the switch -mini a mini-Jarnal will open. The mini-Jarnal is highly customized for handwriting recognition. It supports enough different sets of symbols that you can actually write something and have it recognized. Recognized text is copied to the clipboard so you can transfer it to other programs. There is also a calculator mode that treats whatever was recognized as an arithmetic expression and attempts to evaluate it, copying the result to the clipboard. The philosophy of the mini-Jarnal is somewhat different than that of text recognition in Jarnal proper, although both share the same basic engine. In Jarnal it tries to make an educated guess at what you meant to write, and if you print clearly, it will get it right to a surprising extent. (And

if you are sloppy it will produced total gibberish.) The mini-Jarnal is designed so you can write exactly what you want, and doesn't use nearly as much guesswork.

11 linking

In the application, but not the applet, you can set and traverse hyperlinks to internal and external files. Any object - image, stroke or textbox can have a link. To insert a link, choose the "Insert Link" tool and click on the object you want to add the link to. This brings up a dialog allowing you to set and manipulate the link for that object. For file links, an "internal link" causes the target file to be saved inside the .jaj file as an "extra" file and the link to point to the copy saved in the .jaj file. You can also copy links to existing extra files to the clipboard from the internal file manager. The "Rel" button toggle file links from relative to absolute. The "Paste" button pastes links from the clipboard.

To use a link, click on the "Browse" icon next to the text mode icon, then click on the object with the link. For non-Jarnal files, the target will open in your web-browser, by default Firefox. Jarnal files will be opened by Jarnal - in a new window if the file is not already opened. You can link to specific pages in Jarnal files - copy the target page to the clipboard and when you set the link use the paste button (no other form of pasting such as ctrl-v will work). Note that page references are to the actual page not the page of that number, so if the location of the page moves the reference will still be correct. Copying a page creates a new page reference, while cutting a page puts a page on the clipboard containing the old page reference. So if you cut and paste a page, references to the page will still point to that page. You should be able to reference pages in Jarnal files embedded in other Jarnal files to any depth.

12 External Programs

Jarnal (the application only) supports external programs for special purposes. These three programs are the pdfrenderer, the ps2pdf program and the web-browser. Defaults are set for all three, but can be modified by editing the jarnalshell.conf file created in your home directory after you first run Jarnal. If you aren't sure where your home directory is, check the About box in Jarnal. The default jarnalshell.conf file is

```
pdfrender=gs -dNOPAUSE -dBATCH -dFirstPage=%1 -dLastPage=%2  
-sDEVICE=png16m -sOutputFile=%3 -r%4 -f %5
```

```
ps2pdf=ps2pdf %1 %2
```

```
browser=firefox %1
```

Here the %n will be replaced by the appropriate arguments when the external program is called. Simply replace the command on the right-hand-side of the equality with the program of your choice. The defaults assume the programs gs, ps2pdf and firefox exist and are in your search path.

The pdfrenderer is used when Jarnal is invoked with the -g command line option to render pdf files. The ps2pdf is used to print pdf files no longer used and the browser is used to view non-.jaj hyperlinks. With the ghostscript renderer, you can improve the quality of the image at the expense of speed by adding the switch -dGraphicsAlphaBits=4

From Michael Ellerbeck for Windows here is the procedure for using ghostscript:

WriteOnPDF.cmd - macro to annotate a PDF file

```
java -Xmx256m -jar c:\jarnal-install\jarnal.jar -t
c:\jarnal-install\templates\annotate.jaj -g -b %1 %2 %3 %4 %5
```

Use this with the following option in jarnalshell.conf to use ghostscript as the PDF renderer; note especially the quotes around %5 to deal correctly with files that have spaces in their names

```
pdfrenderer=C:\gs\gs8.50\bin\gswin32c -dNOPAUSE -dBATCH -d
-dGraphicsAlphaBits=4 -dTextAlphaBits=4 -dFirstPage=%1 -dLastPage=%2
-sDEVICE=png16m -sOutputFile=%3 -r%4 -f "%5"
```

13 Advanced

What is the file format? Individual pages are stored as standard .svg files. The paper is stored by name in the title of the file, but the actual lines are not stored. A series of newlines demarcates the break between highlighter and pen. Jarnal can read its own .svg files and produces .svg files that should be readable by other applications. It probably cannot read .svg files produced by other applications. Following the idea in OpenOffice, the .jaj file used by Jarnal is a standard zip file containing the pages plus the plain text configuration file, plus image files, plus the background, if that is being stored in the file. The configuration file is identified by name, but the names of the pages do not matter, only their order. You can also access the svg text by copying individual pages to the clipboard. You may store additional files in the .jaj file using any zip program or the internal file manager; options

are provided also for inserting additional files using the command line or via metadata. These additional files will be preserved when the .jaj file is saved. Extra files should be named jornal.conf, pinteger¿.svg or start with background or image which are the names of files used by jornal.

Configurable Toolbars This is primarily to allow customization, for example, for small screen pda's where the large default toolbars may take up too much screen real estate, but other customization is possible. You should take account of the following:

- When running as an applet, the Save button will be replaced with Network Save.
- One of Save and Network Save tool can be installed. The first one encountered will be installed, any others ignored.
- Only one Request Control tool can be installed. The first one encountered will be installed, any others ignored.
- If the Request Control tool is not installed the Collaborate Menu is removed.
- Tools can be commented out with "#" (actually any invalid tool name will be ignored).
- Toolbars are stored in the document, so unless the document is used as a template, the changes to the toolbar will effect only the document in which you have made the changes. Generally speaking this means you should edit toolbars only for files to be used as templates.

Toolbars are modified by using the "files — manage internal files" dialog box and an external text editor of your choice. From the dialog box, you find a list of toolbars from the dropdown menu. Click on the toolbar you want in the list, and save it to a file. Edit the file with a text editor to get the toolbar you want. Then open the modified file in the dialog box to replace the selected toolbar.

- **Howto Use Word Documents as Backgrounds]**

A new and not well tested feature of Jarnal is the ability to use openoffice to expand the range of documents that can be used as backgrounds to formats supported by openoffice. This includes openoffice documents and other odf documents, as well as documents produced by Microsoft Word, such as .doc's.

Once installed, if you open a file as a background (from the dialog or command line) and Jarnal can't figure out how to read it, then it will try to get openoffice to convert it to a pdf. If the conversion is successful, and the file named (for example) myfile.doc, a new file called myfile.doc.pdf will be created in the same directory, and Jarnal will open that file as the background.

To use this feature you must have openoffice installed; this is true by default on most Linux systems, but regardless, it is a free download here. The rest of the installation must be done by hand.

1. Modify your jarnalshell.conf file in your home directory by adding the line pdfconverter=soffice. Instead of soffice you should use the path to the openoffice executable on your system: soffice will work on many but not all systems. Do not include any command line switches.

NEW NEW NEW: try downloading the installer document - open it and click on the box. If this works, you can skip the rest.

[Warning 1: the April 30 version of the installer and the script below had a bug]

[Warning 2: There is a bug in openoffice 2.0 that prevents the macro from working: upgrade to openoffice 2.1]

2. Run openoffice and go to tools — macros — organize macros — openoffice.org basic. Click on organizer, then on new. Create a new module called Convert (this should be under My Macros — Standard). Click on the module, then on edit, and past the following code (based on code found here)

```
Sub ConvertToPDF(iFile, oFile)
Dim oPropertyValue As New com.sun.star.beans.PropertyValue
iURL = ConvertToURL(iFile)
PropertyValue.Name="Hidden"
PropertyValue.Value=True
Doc = StarDesktop.loadComponentFromURL(iURL, "_blank", 0, Array(oPropertyValue,
URL = ConvertToURL(oFile)
PropertyValue.Name = "FilterName"
PropertyValue.Value = "writer_pdf_Export"
Doc.storeToURL(oURL, Array(oPropertyValue,))
Doc.close(True)
end sub
```

14 FAQ

How do I move a text box? To move a text box you do not drag on the handles, you select it using the selection tool. You change the width by dragging the upper right handle, and the height (if it is a flowed box) by dragging on the bottom left handle. Clicking with the mouse in text mode starts a new text box

with upper left where you clicked. Text boxes by default extend most of the way across the page. If you try to start a new text box to the right of an existing one by clicking it probably won't work, because you clicked in an existing textbox, which selects text rather than creating a new box. You must first change the width of your existing box to make space for the new one, then click to get the new box.

ere when I open a new document? Settings are saved in .jaj files. If you want to change the defaults for a new document you must open the document from a "template" file (command option -t name_of_template). The macros that are used to start jarnal use a template file called "default.jaj" for opening a new window for taking notes, and "annotate.jaj" for opening a new pdf file. To change your options choose File — Options — Edit Current Template. A window will open enabling you to edit the template file. Make the changes you want then save the template file.

How do I draw a straight line? Use the ruler. I want to draw a whole bunch of straight lines and I'm tired of having to choose the ruler for each line Choose "sticky" ruler from the tools menu. This will keep the ruler in play until you explicitly turn it off. Also you may be interested in the "ctrl-a" key which repeats the last menu command. So if you need to erase a bunch of stuff, you could choose the eraser, then keep hitting "ctrl-a" to get it back.

Based on David Levine's website, www.dklevine.com/general/software/tc1000/jarnal.htm