John Deubert's Acumen Journal, December 2002

Table of Contents

Acumen Training

The Acrobat User

Rollover Help, JavaScript Version

Last month, we saw how to implement roll-over help using the "Show-Hide" field action. This month, we'll see another way of doing roll-over help that is more efficient if you have many form fields on a page that need help.

PostScript Tech

Using Images in a PostScript Form, Part 1

This month we start a two-part article discussing how to use images in a PostScript form. A form's *PaintProc* cannot usefully read the input stream, so how do you embed the image data in the form? We'll see how this month.

Class Schedule

Jan-Feb-Mar

Where and when are we teaching our Acrobat and PostScript classes? See here!

What's New?

Not much just now.

Happy holidays, though.

Contacting Acumen

Telephone number, email address, postal address, all the ways of getting to Acumen.

Journal feedback: suggestions for articles, questions, etc.

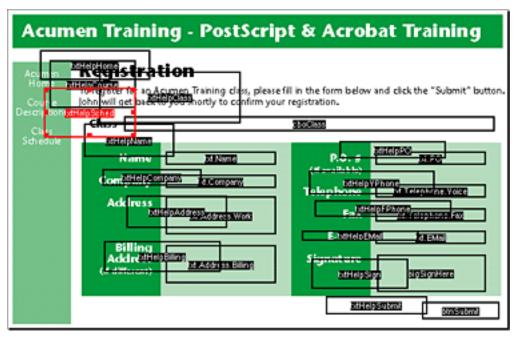
Roll-Over Help, JavaScript Version

Last month, we saw how to implement roll-over help: help text that appears when the mouse rolls over a control or other visual feature on the page (like <u>this</u>). You may remember that we used a pair of *Show-Hide Field* actions to do this:

- A Show Field action, attached to the Mouse Enter event, that makes visible an initially-hidden help text field.
- A Hide Field action, attached to Mouse Exit, that hides the help text field again.

The problem with doing things this way is that we need a separate text field, with appropriate help text, for each item on the page that requires roll-over help. This can yield pages that are very messy and hard to maintain, as at right.

This month, we'll implement roll-over help using JavaScript, a method appropriate for crowded pages.



Overview of the Process

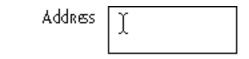
This form is available on the Acumen Training Resources page as FlattenedFood.pdf. Consider the form at right, containing two text fields and a large blue box at the bottom. Whenever the cursor moves into either the Name or Address text fields, a sentence of help text appears in the blue rectangle, as in the lower illustration at right. (Click the magnifier button beneath the upper illustration to see the full, functioning form.)

Using the *Show-Hide Field* action to mplement this roll-over help would entail placing two text fields, one for each text field, atop each other in the blue box. With two fields this might be acceptable; for a form with twenty fields, it would drive you crazy.

Here, we are going to take a different approach.

We shall place a single text field in the blue rectangle. JavaScripts attached to the Name and Address fields' *Mouse Enter* events will place appropriate help text into the single help field. JavaScripts attached to the text fields' *Mouse Exit* event will erase the help text.





Type your address into this field.

The advantage here is that *all* the form fields that need roll-over help will a single text field for displaying their help text. This will make our form field far less complicated than if we needed a separate help field for each form field.

The JavaScripts

As you can see at right, our form has three fields:

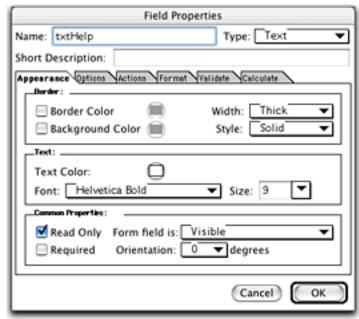
- txtName and txtAddress are the text fields that collect information from the user of our form.
- txtHelp is the text field that displays our roll-over help.



I created the visible help box (that is, the blue rectangle) in the original *Illustrator* artwork. The *txtHelp* field is an invisible text field placed over the blue rectangle; its initial properties are:

- Border Color and Background Color: off
- Read-only: on
- Text Color: white
- Default text (in the *Options* panel): Empty

These properties together make the text field completely invisible on the page. Note that we need our text color to be white so that the eventual help text will be visible against the blue background.

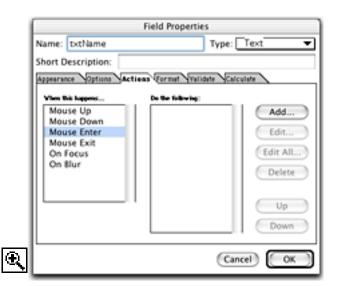


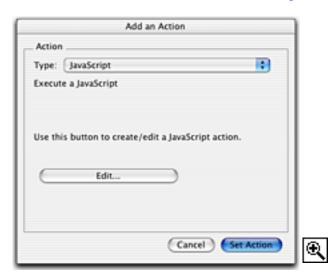
Mouse Enter JavaScript

Let's start by attaching a JavaScript Action to the *txtName* field's *Mouse Enter* event. This JavaScript will be executed any time the mouse enters the button. I'm going to refer you to last month's Journal for a detailed description of how to attach an Acrobat action to an event. The short version is:

Attaching a JavaScript

- With the Form tool selected, double-click on the form field to which you want to attach the JavaScript
- In Actions panel of the resulting *Field Properties* dialog box (left, below), select the *Mouse Enter* event and click on the *Add* button.
- In the resulting *Add Action* dialog box (right, below), select the type of Action you want to attach to the field (*JavaScript*, in our case).





- You will now be looking at the JavaScript Edit dialog box; type your JavaScript into the textedit box. (We'll look at the actual JavaScript code in a moment.)
- Back out of all the dialog boxes until your are looking at the Acrobat page.

You will need to carry out these steps to attach JavaScripts to the Mouse Enter and Mouse Exit events of each form field for which you want roll-over help.



The JavaScript

The *Mouse Enter* JavaScript is a simple, two-line script that inserts appropriate text into our help text field. In our case, that help text will prompt the user to type a name into the Name field.

```
var helpFld = this.getField("txtHelp")
helpFld.value = "Type your name into this field."
```

Let's look at it in detail.

Step by Step var helpFld = this.getField("txtHelp")

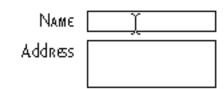
This first line creates a named reference (a "variable") to our form's help text field. The phrase this.getField("txtHelp") says, in English, "In this document, get the form field whose name is txtHelp." The equal sign assigns this form field to the named reference helpFld.

In the remainder of our script, the name"helpFld" will represent our help text form field.

helpFld.value = "Type your name into this field."

The second line of our script sets the value of our form field to the text "Type your name, etc." The "value" of an Acrobat text field is the text that it displays to the user; setting the value of the field makes the specified text appear in our help box.

Application for Employment



Next Page ->

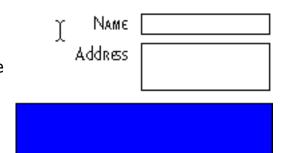
Type your name into this field.

Mouse Exit JavaScript

The JavaScript we must attach to the *txtName* field's *Mouse Exit* event is nearly identical to the *Mouse Enter* JavaScript:

```
var helpText = this.getField("txtHelp")
helpText.value = ""
```

The only difference between this JavaScript and our previous one is that the text we are placing into the help text field is blank, denoted by two adjacent quote marks. This causes our help text field to become invisible again when the mouse leaves the *txtName* form field.



That's All That's all there is to it.

I do pretty much all my roll-over help in this way. Entering the JavaScript is no harder than using last month's Show-Hide field method and is *much* easier to work with in even very simple forms.

Return to Main Menu

Using Images in Forms, Part 1

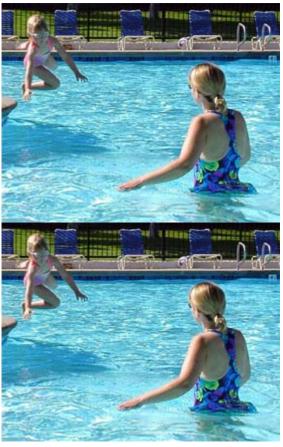
This month and next we shall examine techniques for using images in PostScript forms. We shall look at three PostScript programs that use an image (the "Jumping Granddaughter") in a form, executing the form twice to produce the output at right.

The three techniques shall discuss are:

- Save Data to Disk This works very well and has a minimal impact on VM. It does require that your PostScript RIP have a hard disk.
- ReusableStreamDecode filter This is the best way to do things if you have a PostScript LanguageLevel 3 printer.
- Filtered Data Acquisition Procedure This is my favorite solution to this problem; it works on Level 2 printers and does not require a hard disk.

We shall be talking images here, but these techniques are appropriate for any type of data you want to repeatedly access in a PostScript program (including executable PostScript code, such as EPS files).

Let's take a look.



A Review of Images and Forms

We shall start this month's discussion by looking at a PostScript program that prints our test image, just to remind ourselves how we print images in PostScript. We shall also look at a program that creates a simple PostScript form, also as a reminder.

These reminders are going to be fairly brief; I am assuming that you at some point have seen how to print images and execute forms in PostScript and just need to see an example or two to become reacquainted.



If these topics have evaporated completely from your memory, you may want to review them in the *PostScript Language Reference Manual* or in your PostScript student notes. (We talk about forms in the Advanced PostScript class; we discuss images in all the PostScript classes.)

The *image* Operator

The PostScript code that prints our image is as follows:

All of this month's code is in the file ImagesForms1.zip on the Acumen Training Resouces page.

The code at right is in the zip file as BasicImage.ps

```
/DeviceRGB setcolorspace % It's an rgb image
72 360 translate % Specifies the position
278 219 scale % Specifies the size
<<
  /ImageType 1
  /Width 278
             % in pixels
  /Height 219 % in scanlines
  /BitsPerComponent 8 % 8 bits each, rgb
  /ImageMatrix [ 278 0 0 -219 0 219 ]
    % [ w 0 0 -h 0 h ]
  /DataSource currentfile /ASCIIHexDecode filter % Data in ASCII format
  /Decode [ 0 1 0 1 0 1 ] % Map data 0...FF into color values 0...1
>> image
2c192d200f1f2213182319181d14171914181b161d121117121212141611
16191211140d0e0e0e13121716131c0d0b161517240d111c12151c13171a
```

Note that the image data follows the invocation of *image* in our PostScript code. This is significant to our task, because this is precisely what we *cannot* do when we move our image into a form.

0f0e131414161d181e1611181f17241a1221170c1d160b1b190e1e1c121d

PostScript Forms

As you recall, a PostScript form is a container for a PostScript graphic that is to be printed repeatedly in a PostScript job. The first time the form is used, PostScript executes the code that draws the form and, at the same time, it caches the graphic. Successive uses of the same form can grab the graphic from the cache, rather than re-executing the PostScript code. This can be *very* much faster.

As a reminder of what forms look like, the code on the next page defines a form consisting of a yellow triangle and then executes the form twice, producing the results at right.

This code is in this month's zip file as *TriangleForm.ps*

```
/TriangleForm
                        % Begin our form dictionary
<<
    /FormType 1
                        % All forms have FormType 1
    /PaintProc
                     % This proc draws our form
                        % Discard the argument (the form dictionary)
         qoq
         50 100 moveto 100 0 lineto % Draw a yellow triangle
         0 0 lineto closepath
         gsave
         0 0 1 0 setcmykcolor fill
         grestore
         stroke
    } bind
    /BBox [ -1 -1 101 101 ] % This bounding box includes the line width
    /Matrix [ 1 0 0 1 0 0 ] % Scale by 1, translate by 0
>> def
TriangleForm execform
                        % First execution: PaintProc is executed
0 100 translate
TriangleForm execform
                        % Second execution: triangle taken from cache
```

Although we get two triangles on the page, our form's *PaintProc*, which draws the triangle, is executed only once. The triangle is cached in the first execution of the form; the second *execform* retrieves the triangle from the form cache.

Our Challenge

What we want to do is combine our two sample programs to create a form that prints an image. Clearly, our *PaintProc* is going to contain a call to the *image* operator. Most people's first attempt to do this is to simply put their non-form call to *image* into the form's *PaintProc* exactly as-is, yielding something that looks like this:

```
This doesn't work
```

```
/ImageForm
               <<
     /FormType 1
     /PaintProc
          pop
          278 219 scale % Specifies the size on the page
          <<
               /ImageType 1
               /Width 278
               /Height 219
               /BitsPerComponent 8
               /ImageMatrix [ 278 0 0 -219 0 219 ]
               /DataSource currentfile /ASCIIHexDecode filter
               /Decode [ 0 1 0 1 0 1 ]
          >> image
          16191211140d0e0e0e13121716131c0d0b161517240d111c12151c13171a
          0f0e131414161d181e1611181f17241a1221170c1d160b1b190e1e1c121d
     } bind
     /BBox [ 0 0 278 219 ]
     /Matrix [ 1 0 0 1 0 0 ]
>> def
                                                                  Next Page ->
```

The preceding PostScript code places the image data in-line with our procedure definition. This doesn't work. Procedure body contents are scanned and converted to PostScript objects when the procedure is created; our ASCII-encoded image data is converted by the PostScript scanner into a series of executable names. At execution time, the interpreter will try looking these names up and will generate an *undefined* error:

%%[Error: undefined OffendingCommand: 16191211140d0e0e0e13121716131...]%%

This is not what we had in mind.

We must supply data to our PaintProc's image operator in some form other than a data

stream in-line with the *PaintProc's* PostScript code.

This (finally) is what we shall discuss this month and next.

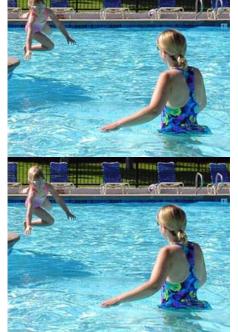
Our Project

We shall look at three PostScript programs that place our Jumping Granddaughter image in a form and execute that form twice, producing the double image at right. As we said earlier, we shall:

Example 1. Save the image to a hard disk

Example 2. Use a ReusableStreamDecode filter

Example 3. Attach a filter to an array of strings



1. Save Data on Hard Disk

Our first method of using an image within a form starts by saving the image data in a temporary file on disk; our *PaintProc's* call to *image* will read the data from disk.

The disk on which we are going to save our image data must be directly available to our RIP. In the case of a stand-alone printer, this must be a disk built into the printer or attached to it by a USB, SCSI, or other port. Printers that have a separate RIP almost always have access to the hard disk of the computer on which the RIP is running.

There are two distinct steps to this method of making an image form:

1. Save the image data to disk.

We do this in PostScript pretty much the way we do it in any other language: open source and destination files and then fire up a loop that reads data from the source and writes it to the destination. In PostScript, the source will usually be *currentfile*. We actually saw how to do this, in a slightly different context, in the January 2002 issue of the Acumen Journal.

2. Create a form whose *PaintProc* makes a call to *image* that uses this data from the disk.

Our form's *PaintProc* will open the image data file and hand it to the *image* operator as our data source.

The Program /buffer 8192 string def % An 8k input buffer; resize to taste

This program is in this month's zip file as TwoImagesOnDisk.ps.

```
/WriteToTempFile % datasource (filename) => ---
    /dest exch (w) file def % Open our destination file
    /src exch def
                              % Give the datasource a key name
        src //buffer readstring % Loop: read a buffer of data
        dest 3 -1 roll writestring % write the data to dest
        % Repeat until done
    } loop
    dest closefile
                              % Close the destination file
} bind def
currentfile /ASCIIHexDecode filter % Our data source
(tempImage.data)
                         % The name of our temp file
WriteToTempFile
                               % Proc invocation followed by data
2c192d200f1f2213182319181d14171914181b161d121117121212141611
... Lots of image data here...
aledfba2f0fda6f2ffa9f5ffaef6ffaef7ffaef7ffaef7ffaef7ffaef7ff
                      % This is the ASCIIHexDecode end-of-data marker
>
```

The Program, continued /JumpForm <<</pre>

```
% FormType is always 1
    /FormType 1
    /BBox [ 0 0 278 219 ] % The form prints the image at 0,0
    /Matrix [ 1 0 0 1 0 0 ]
    /PaintProc % Here we draw our form
                          % We don't need the dictionary argument
         qoq
         /DeviceRGB setcolorspace % We're printing an rgb image
         278 219 scale % This will be the size of the printd image
                           % Begin our image dictionary
         <<
             /ImageType 1
             /Width 278 % Our image is 278 samples across...
             /Height 219 % ...and 219 scanlines hight
             /BitsPerComponent 8 % 8 bits each of r, q, and b
             /ImageMatrix [ 278 0 0 -219 0 219 ] % [ w 0 0 -h 0 h ]
             /DataSource (tempImage.data)(r) file % Our data file
             /Decode [ 0 1 0 1 0 1 ] % Map data 00...ff into color 0...1
         >> image % Call the image operator
         Data
    } bind
>> def
JumpForm execform % Here the PaintProc gets executed
0 219 translate
JumpForm execform % Here the form is rendered from the cache
```

Whew! Let's see what's happening here.

Stepping Thru' the Code

Write image data to disk /buffer 8192 string def

We start by creating a suitably-sized string to use as an input buffer

```
/WriteToTempFile % datasource (filename) => ---
```

We define a procedure called *WriteToTempFile*. This procedure takes as arguments a file object for the data source and a string containing the name of our destination file. The procedure creates the destination file with the specified name and then copies the entire contents of the data source into the destination file.

```
{    /dest exch (w) file def
    /src exch def
```

We create and open our destination file, giving the newly-created file object the keyname *dest*. We also save the data source fileobject with the keyname *src*.

This loop moves the data into our file. Each time through the loop we do the following:

• Read a bufferful of data from *src*; the *readstring* operator returns *buffer*, now full of image data, and a boolean that will be *false* if we're at end of our source file.

- Write the contents of *buffer* to *dest*.
- Reverse the boolean and exit from the loop if the reversed boolean is true (that is,
 if the original boolean was false, indicating end of file).

```
dest closefile
} bind def
```

Finally, we finish our procedure definition by closing the destination file.

```
currentfile /ASCIIHexDecode filter
(tempImage.data) % The name of our temp file
WriteToTempFile
```

Having defined our *WriteToTempFile* procedure, we use it to write our image data to disk. The procedure wants two arguments, remember: a fileobj that is the source of the data (in our case, currentfile with the ASCIIHexDecode filter attached) and a string containing the name of the file into which to copy the data.

```
aledfba2f0fda6f2ffa9f5ffaef6ffaef7ffaef7ffaef7ffaef7ffaef7ff
```

The call to *WriteToTempFile* is followed by the image data, in this case ASCII encoded. Note that our image data ends with a ">," the end-of-data marker for the ASCIIHexDecode filter; this will be seen by our loop as logical end-of-file. Our loop's call to *readstring* will return *false* at when it hits this marker. As a result, *WriteToTempFile* will not read past this point and we can follow the > with clear PostScript.

Note that you could run our PostScript code to this point as a separate file, saving the image data for later, repeated use.

```
/JumpForm <<
/pre>
/FormType 1
/BBox [ 0 0 278 219 ]
/Matrix [ 1 0 0 1 0 0 ]
```

Having saved our image data to a temp file, we can begin the construction of our form dictionary. We set *FormType* to 1, *BBox* to values appropriate to our scaled image, and *Matrix* to an identity matrix.

When *execform* executes *PaintProc*, it places on the stack a copy of the form dictionary as an argument. Since *PaintProc* makes no use of anything in this dictionary, we can safely discard it with a *pop*.

```
/DeviceRGB setcolorspace 278 219 scale
```

Now our *PaintProc* calls the *image* operator. This looks very similar to the program on page 11. It begins by setting the colorspace to match that of image data (RGB, in this case) and scaling to the size we want for the printed image.

Most of the image dictionary contents are identical to our earlier, stand-alone image. The exception is the *DataSource*, which is now our data file.

Note that here I am opening the data file each time I want to print the image. An alternative would have been to open the data file at the time we create our form dictionary and then have our *PaintProc* rewind the file to the start. I'm not going to describe that technique here; look at *TwoImagesRewind.ps* in this month's zip file.

```
>> dup image
```

PaintProc finishes creating the image dictionary, does a dup (saving a copy for later), and calls the *image* operator.

```
/DataSource get closefile
```

As a final step, our *PaintProc* closes the temp file associated with the *DataSource* key in our image dictionary. (This is why we did a *dup* on our image dictionary before calling *image*.

} bind
>> def

That is the end of our *PaintProc* and the end of our form dictionary. We do a *def*, associating the form dictionary with the name *JumpForm*. (You may have noticed we placed the name "/JumpForm" on the stack at the start of our dictionary construction.)

JumpForm execform 0 219 translate JumpForm execform

Now, let's use our new form, shall we? We execute the form twice. The first time, execform must execute our PaintProc, opening the temp file, executing image, and caching the painted image.

In the second execution of *JumpForm*, *execform* can draw the painted image from the form cache; *PaintProc* will not need to be executed. (This presumes there was enough RAM available to the RIP to successfully cache the form, of course.)

Final Comments

This technique works quite well and is not particularly hard, conceptually. Two final comments are in order:

Deleting the Temp File

One bit of cleanup we did not do here was delete our temp file when we were finished. (I didn't do this because I thought, if you run this program, you'd like to see the temp file on your disk.) In a real situation, you should add the following line to the very end of the PostScript code:

(tempImage.data) deletefile

Not surprisingly, the *deletefile* operator takes the name of a file on the RIP's hard disk and deletes it.

Tidiness is important.

Limitations

This technique depends on the RIP's having access to a hard disk. This will be true of most PostScript devices whose RIPs reside on a computer separate from the printing engine. Desktop printers (or other all-in-one PostScript printers) must have a hard disk built in or attached to a USB, SCSI, or other port.

If you try this code on *Distiller*, by the way, the temp file will appear in the *Distiller* directory on your computer's hard disk, unless you supply a full pathname for the temp file.

Next Month?

That's enough for the moment.

Next month, we shall look at the other two ways of incorporating images into a form:

- ReusableStreamDecode The best way to do things if you have a Level 3 RIP.
- Filtered Data Acquisition Procedure My favorite solution to this problem, overall. Requires only a Level 2 printer and doesn't require a hard disk.

See you next month.

Return to Main Menu

PostScript Class Schedule

Schedule of Classes, Jan - Mar 2003

Following are the dates and locations of Acumen Training's upcoming PostScript and Acrobat classes. Clicking on a class name below will take you to the description of that class on the Acumen training website. The Acrobat class schedule is on the next page.

The PostScript classes are taught in Orange County, California and on corporate sites world-wide. See the Acumen Training web site for more information.

PostScript Classes

PostScript Foundations January 27 - 31 March 24 - 28

Advanced PostScript March 3 – 7

PostScript for Support

February 10 - 14 **Engineers**

Jaws Development

On-site only; see the Acumen Training website for more information.

For more classes, go to www.acumentraining.com/schedule.html

PostScript Course Fees

PostScript classes cost \$2,000 per student.

These classes may also be taught on your organization's site. Go to www.acumentraining.com/onsite.html for more information.

Registration \rightarrow Acrobat Classes →

Acrobat Class Schedule

Acrobat Class Schedule

These classes are taught quarterly in Costa Mesa, California, and on corporate sites. Clicking on a course name below will take you to the class description on the Acumen Training web site.

Acrobat Essentials No Acrobat classes scheduled for this quarter. See the Acumen Training website regarding setting up an on-site class.

Interactive Acrobat

Creating Acrobat Forms

Troubleshooting with Enfocus' PitStop

Acrobat Class Fees Acrobat Essentials and Creating Acrobat Forms ($\frac{1}{2}$ -day each) cost \$180.00 or \$340.00 for both classes. Troubleshooting With PitStop (full day) is \$340.00. In all cases, there is a 10% discount if three or more people from the same organization sign up for the same class. Registration ->

Return to Main Menu

Contacting Acumen Training

Contacting John Deubert at Acumen Training

For more information

For class descriptions, on-site arrangements or any other information about Acumen's classes:

Web site: http://www.acumentraining.com email: john@acumentraining.com

telephone: 949-248-1241

mail: 25142 Danalaurel, Dana Point, CA 92629

Registering for Classes

To register for an Acumen Training class, contact John any of the following ways:

Register On-line: http://www.acumentraining.com/registration.html

email: registration@acumentraining.com

telephone: 949-248-1241

mail: 25142 Danalaurel, Dana Point, CA 92629

Back issues

Back issues of the Acumen Journal are available at the Acumen Training website:

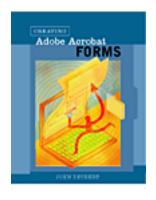
www.acumenjournal.com/AcumenJournal.html

Return to First Page

What's New at Acumen Training?

Nothing New This Month.

A quiet month. Winter approaching. This is noticeable in Southern California mostly because of the light: low-angled, golden, picking out every detail in the trees and hills. Quite pretty in a subtle way.



Creating Acrobat Forms

John Deubert, Adobe Press

"So that's how it works. I'd never been sure until I read this book."

- A. Einstein

Return to First Page

Acumen Journal: What's New

Journal Feedback

If you have any comments regarding the *Acumen Journal*, please let me know. In particular, I am looking for three types of information:

Comments on usefulness. Does the Journal provide you with worthwhile information? Was it well written and understandable? Do you like it, hate it? Did it inspire you try to conduct your own appendectomy?

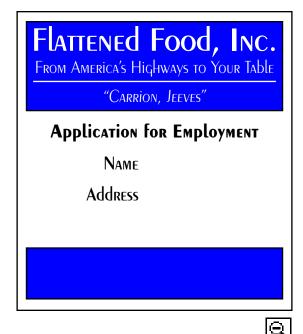
Suggestions for articles. Each Journal issue contains one article each on PostScript and Acrobat. What topics would you like me to write about?

Questions and Answers. Do you have any questions about Acrobat, PDF or PostScript? Feel free to email me about. I'll answer your question if I can. If enough people ask the same question, I can turn it into a Journal article.

Please send any comments, questions, or problems to:

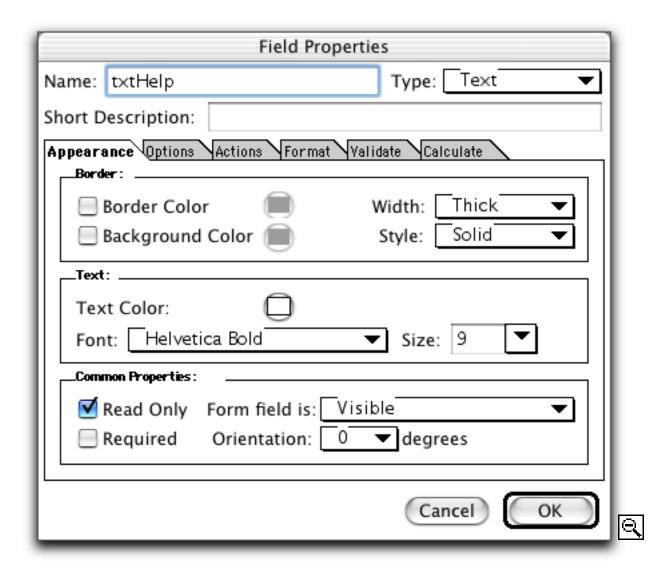
journal@acumentraining.com

Return to Menu









Flattened Food, Inc.

From America's Highways to Your Table

"CARRION, JEEVES"

Application for Employment

NAME

Address