

The `attachfile` package*

Scott Pakin
`scott+af@pakin.org`

March 7, 2005

Abstract

This package defines an `\attachfile` command that lets you attach arbitrary files to a PDF document. These files are embedded right in the PDF file, so they get transmitted along with it. The package also gives you control over the corresponding icon's properties and various other associated metadata.

Contents

1	Introduction	2
2	User interface	2
2.1	Commands	3
2.2	Options	4
3	Caveats	7
4	Implementation	8
4.1	Sanity checking	9
4.2	Preliminaries	9
4.3	Adobe Acrobat icons	9
4.4	Helper routines	11
4.5	Annotation option processing	15
4.6	Author commands	17
4.7	Dummy commands	19
5	Future work	19
	References	20
	Index	21

*This file has version number v1.2, last revised 2005/02/20.



1 Introduction

PDF, Adobe's Portable Document Format, is a common way to distribute documents that look the same on all platforms and output devices. Beginning with PDF version 1.3, PDF supports "file attachment annotations". These are arbitrary auxiliary files that get embedded directly into the PDF document, just like attachments in an e-mail message.

The `attachfile` package gives pdf \LaTeX users the ability to add these attachments to their documents automatically. And because \LaTeX is a markup language, not a WYSIWYG tool, the user has precise control over the location of the file attachment icons. If an icon representing an attached spreadsheet file is placed next to a figure, the icon will move along with the figure whenever the document is modified. Furthermore, it is possible to define global properties for all the file attachments in a document. With one command, a user can change the properties of all the icons in the entire document.

Finally, one nifty feature that `attachfile` supports is the ability to use your own icons, which can be text, graphics, tables, mathematics—you name it! With this feature, a PDF file can, for example, instruct the reader to click on a formula to extract the Mathematica notebook that derived it. Or to click on a graph to extract the Microsoft Excel spreadsheet that contains all the data that was plotted. The possibilities are endless.

Okay, let's get down to business. Here are some sample file attachments, so you can see if your PDF viewer is able to handle them:

Icon:		(Should look like this: )
\LaTeX text:	<code>attachfile.bib</code>	(Should look like this: <code>attachfile.bib</code>)

Each of the above points to the BIB \TeX bibliography (a plain text file) for the document you're reading now. Try extracting the attachment. In Adobe Acrobat, this is achieved by right-clicking on the icon and choosing "Extract File...". You can also double-click to open the file immediately. If you're unable to access the attached file, or you observe miscellaneous strange behavior, your PDF viewer might not be capable of handling file attachments properly. See Section 3 for some PDF viewer problems I encountered while testing `attachfile`.

2 User interface

Load `attachfile` by putting a `\usepackage{attachfile}` in your document's preamble. `attachfile` implicitly loads a variety of other packages. Section 3 presents the complete list.

`attachfile` v1.2 does not have any of its own package options; any options that get passed to `attachfile` are forwarded to `hyperref`. Because `hyperref` works best when loaded as one of the last packages in the document, the same holds true for `attachfile`.

2.1 Commands

The following are the commands that `attachfile` makes available for attaching files, customizing the icon appearance, and changing various file attachment metadata.

`\attachfile [<options>] {<filename>}`

The `\attachfile` macro, has only one required argument: the name of the file to attach. `\attachfile` will insert an icon at the current point in the document to represent the attachment. *<options>* is a list of optional parameters for describing the icon and other assorted metadata. It is described in Section 2.2.

`\noattachfile [<options>]`

When writing instructions, it is sometimes convenient to describe what a file attachment icon looks like without actually attaching a file. That's what `\noattachfile` is for. All it does is insert the image of a file attachment icon into the document. *<options>* is a list of optional parameters for describing the icon and other assorted metadata. It is described in Section 2.2. In particular, note that if the `print` option is set to `false` then `\noattachfile` will output empty space of the same size as the icon image.

`\textattachfile [<options>] {<filename>} {<text>}`

`\textattachfile` is just like `\attachfile`, except that instead of using one of the predefined PDF icons, it lets you use an arbitrary piece of text to represent the attachment. The *<text>* parameter is not limited to text; it can contain any arbitrary horizontal material. The following are all legal uses of `\textattachfile`:

- You can `\textattachfile{myfile.cc}{extract my source code}` if your PDF viewer supports file annotations.
- It is intuitively obvious to even the most casual observer that

```
\textattachfile{derivation.m}{\displaystyle
\frac{\partial E_p}{\partial w_{ji}^h} =
-\sum_k (y_{pk} - o_{pk}) f_k^{(o)} (\mbox{net}_{pk}^o)
w_{kj}^o f_j^h (\mbox{net}_{pj}^h) x_{pi}}}
```

- `\textattachfile{earningsdata.csv}{\includegraphics{earnings}}`

`\notextattachfile [<options>] {<text>}`

Just as `\noattachfile` is a dummy version of `\attachfile`, so `\notextattachfile`

is a dummy version of `\textattachfile`. All `\notextattachfile` does is insert $\langle text \rangle$ into the document according to $\langle options \rangle$ (described in Section 2.2). In particular, note that if the `print` option is set to `false` then `\notextattachfile` will output empty space of the same size as $\langle text \rangle$.

`\attachfilesetup { $\langle options \rangle$ }`

If you find yourself passing the same set of options to multiple `\attachfile` calls in your document, you can use `\attachfilesetup` to specify default option values. `\attachfilesetup`'s $\langle options \rangle$ parameter is the same as that used by `\attachfile` and is described in Section 2.2. Some noteworthy points are:

1. `\attachfilesetup` can be called as many times as desired. Any options specified replace the previous value of those options. All unspecified options are left alone.
2. Options passed to `\attachfile` take precedence over those specified by `\attachfilesetup`. This lets you define default values for all file attachments and selectively override them on a per-attachment basis.
3. Options set by `\attachfilesetup` are local to the current scope. This lets you assign defaults to a group of file attachments without affecting the global defaults. To define options that apply to the entire document, `\attachfilesetup` should be called at the top-level scope (which includes the document's prologue).

2.2 Options

`attachfile` gives the user a great deal of control over the way files are attached to a document. All the commands in Section 2.1 accept the same set of options, which are entered as comma-separated, $\langle key \rangle = \langle value \rangle$ pairs. Options can be specified in any order. Case is significant. And only the options you want to change need to be specified; the others will retain their previous value (or the default, if no previous value was specified).

The following are the options `attachfile` accepts, in alphabetical order.

`appearance = \langle boolean \rangle`

The `attachfile` package normally embeds the file attachment's icon explicitly with each file attachment annotation. (In PDF-speak, it includes an appearance dictionary in the `FileAttachment` object.) The advantages to doing this are to ensure that:

- The file attachment icons look the same in all PDF viewers.
- \TeX knows exactly how much space to allocate, instead of just guessing based on the size of the Adobe Acrobat icons.

- Pre-1.3 PDF viewers don't regress to showing an “unknown annotation type” graphic.

However, the problems with embedding the icon graphic are:

- It adds a bit of extra bulk to the PDF file.
- It takes flexibility away from the PDF viewer, which can no longer choose for itself how best to render a file attachment icon.

The **appearance** option gives the author the ability to prevent the icon's appearance from being specified explicitly in the PDF file. By setting **appearance=false**, it will be left up to the PDF viewer to decide how to display the icon.

author=*<text>*

The metadata associated with a file attachment annotation includes the name of the person who attached the file. In Adobe Acrobat, this information is shown when one right-clicks on the file attachment icon and selects *Properties*. By default, no author is listed, but specifying **author**=*<name>* sets the author field to *<name>*.

color=*<red>* *<green>* *<blue>*

The icons inserted by **\attachfile** and the text inserted by **\textattachfile** can be any color. The **color** option sets this color. Each of *<red>*, *<green>*, and *<blue>* must be a decimal number between 0 (darkest) and 1 (brightest). The default is **color=1 0.9255 0.7765**, which is a beige.

date=*<text>*

Every annotation in a PDF can have a timestamp indicating when the annotation was last modified. **attachfile** automatically adds a timestamp to file attachment annotations. It uses the time and date at which \LaTeX started processing your job and converts it to the form “**D:YYYYMMDDHHmmSS**”, which is the format recommended by the PDF reference manual [1, p. 89], minus the Universal Time information.¹

The **date** option lets you specify the modification date and time explicitly. Note, however, that although the PDF reference manual clearly states that “viewer applications should be prepared to accept and display a string in any format” [1, p. 400], Adobe Acrobat will ignore any timestamp that is not in the recommended format and will instead show the current date and time.

¹In addition, seconds are hardwired to zero, because \TeX 's **\time** command has only minute precision.





Graph	
Paperclip	
PushPin	
Tag	

Table 1: Valid file attachment icons

`description=<text>`

The metadata associated with a file attachment annotation can include a brief description of the file. In Adobe Acrobat, this information is shown when one right-clicks on the file attachment icon and selects *Properties*. Also, in later versions of Adobe Acrobat, the description field shows up as a tool tip when the user mouses over the attachment. By default, no description is included, but specifying `description=<text>` sets the description field to `<text>`.

`subject=<text>`

The metadata associated with a file attachment annotation can include a brief comment about the subject of the attachment. In Adobe Acrobat, this information is shown when one right-clicks on the file attachment icon and selects *Properties*. By default, no subject is included, but specifying `subject=<text>` sets the subject field to `<text>`.

`icon=<name>`

PDF 1.3 defines four icons that can be used for file attachments: **Graph**, **Paperclip**, **PushPin**, and **Tag**. These are shown in Table 1. If no icon name is specified, **PushPin** is assumed. While the PDF specifications say that, normally, a PDF viewer chooses how to display each of those, the `attachfile` package specifies the appearance explicitly. This is what Adobe Acrobat does, presumably because doing so ensures that viewers which don't support file attachment annotations can still display something reasonable. The tradeoff is that it slightly increases the size of the PDF file.

`mimetype=<type>`

It is considered good practice to specify the MIME type [2] of each attached file. That way, a PDF viewer can automatically launch an appropriate application to process the file. `<type>` should be the form “`<type>/<subtype>`”. For instance, a plain text file would be specified with “`mimetype=text/plain`”. An MPEG movie

would be specified with “`mimetype=video/mpeg`”. The Internet Assigned Numbers Authority maintains a list of registered media types [3], so look there first to see what type to use for a given file.

```
print=<boolean>
```

By default, file annotation icons print along with the rest of the document. By setting `print=false`, the icons will not print. Note that in Adobe Acrobat, annotations will *never* print unless the Annotations box is checked in the Print dialog.

$$\text{timezone}=\langle offset \rangle$$

Because TeX doesn't make the current timezone available, `attachfile` is unable to include timezone information when it timestamps a file attachment. The `timezone` option lets you manually specify the timezone. $\langle offset \rangle$ is the offset from Universal Time (a.k.a. GMT) and should be in the format specified in the PDF reference manual [1], namely:

+ $\langle HH \rangle$, $\langle mm \rangle$, $\langle HH \rangle$ hours, $\langle mm \rangle$ minutes later than Universal Time
(i.e., east of Greenwich, England)

$-\langle HH \rangle, \langle mm \rangle$, $\langle HH \rangle$ hours, $\langle mm \rangle$ minutes earlier than Universal Time (i.e., west of Greenwich, England)

Z Universal Time (i.e., at the same longitude as Greenwich, England)

For example, U.S. Central Time would be specified with `timezone=-06'00'`.

zoom=*boolean*

Normally, when a reader magnifies or reduces the view of the PDF document, the file annotation icons change size proportionally with the text. By setting `zoom=false`, the icon size does not scale.

The defaults for all of the options described above are summarized in Table 2.

3 Caveats

Note that there are a few caveats you should be aware of:

1. `attachfile` will not run unless the following \LaTeX packages are installed: `calc`, `keyval`, `color`, `hyperref`, and `ifpdf`.

Option	Default setting
appearance	true
author	<i>none</i>
color	1 0.9255 0.7765
date	<i>automatic</i>
description	<i>none</i>
subject	<i>none</i>
icon	PushPin
mimetype	<i>none</i>
print	true
timezone	<i>none</i>
zoom	true

Table 2: Default values for all options

2. File attachments are a PDF 1.3 feature. They will not be visible in PDF viewers that do support PDF 1.3. (Version 4.0 of Adobe Acrobat is the first version of that program which does.)
3. Even some viewers that purportedly support PDF 1.3 don't support file attachments. As far as I can tell, Adobe Acrobat Reader (the free, view-only version of Adobe Acrobat) doesn't seem to support *any* annotations except text annotations.
4. Even some viewers that do support PDF 1.3 and file attachments don't support them under all circumstances. For instance, the Windows version of Adobe Acrobat, when functioning as a Web-browser plug-in, gives an error message² when a file attachment icon is activated.
5. Even in circumstances where file attachments are supported, the support may be flawed. For example, the Windows version of Adobe Acrobat changes a custom icon to the default icon when it's selected.

In addition, **attachfile** requires pdfL^AT_EX version 0.14 or later. While there are many other ways to produce PDF files from L^AT_EX source, **attachfile** v1.2 supports only pdfL^AT_EX, and only versions 0.14+.

Even given all of those caveats, file attachments can be a useful way to pass additional information along with a PDF file. The **attachfile** package makes file annotations automatic and easy.

4 Implementation

This section contains the complete source code for **attachfile**. Most users will not get much out of it, but it should be of use to those who need more precise

²“Launching embedded files from within a browser environment is not allowed”.

documentation and those who want to extend the `attachfile` package.

```
1 <*package>
```

4.1 Sanity checking

`attachfile` v1.2 requires pdf \LaTeX (and at least version 0.14, although `attachfile` no longer checks for that). (Future versions of `attachfile` may support dvipdfm, dvips with pdfmarks, VT \LaTeX , etc.) Also, pdf \LaTeX must be in PDF-generating mode, not DVI-generating mode. So, to save the user some aggravation, we check for the correct backend right up front and give a warning if all is not well. Later, in Section 4.7, we replace all of the core `attachfile` macros with dummy versions so \LaTeX can at least run to completion.

```
2 \RequirePackage{ifpdf}
3 \ifpdf
4 \else
5   \PackageWarningNoLine{attachfile}{%
6     attachfile works _only_ with pdfLaTeX and _only_ in\MessageBreak
7     PDF-generating mode. For this run, placeholders will\MessageBreak
8     be substituted for all attachfile commands.}
9 \fi
```

4.2 Preliminaries

We need to load `hyperref` to get our hands on that great `\pdfstringdef` macro. For now, we blindly pass all our package options directly to `hyperref`. In the future, it would be nice to do a `\setkeys{AtFi}` on our options.

```
10 \RequirePackage{keyval}
11 \RequirePackage{calc}
12 \RequirePackage{color}
13 \RequirePackageWithOptions{hyperref}
```

4.3 Adobe Acrobat icons

The following macros draw a representation of the various icons that Adobe Acrobat³ inserts to represent what the PDF 1.3 specifications refer to as “Graph,” “Paperclip,” “PushPin,” and “Tag”. The `\parbox` dimensions are taken directly from the original graphics’ bounding box. However, I just eyeballed the `\raisebox` heights (intended to put shadows below the baseline).

```
\atfi@acroGraph@data  Recreate Adobe Acrobat’s Graph icon.
14 \newcommand{\atfi@acroGraph@data}{%
15   q 0.5 g 1.1133 0 20.7202 18.2754 re f 1 g 0 G 0 i 0.5 w 4 M
16   0.25 1.6453 20.145 17.7715 re B 0 g 2.7319 4.1367 3.9571
17   13.8867 re f 8.7031 4.1367 3.9571 9.8867 re f 14.7471 4.1367
18   3.9571 11.8867 re f \atfi@color@rgb\space rg 1.689 3.0938
```

³I got these graphics specifically from the Windows version of Adobe Acrobat 4.0.

```

19 3.9571 13.8867 re f 7.6602 3.0938 3.9571 9.8867 re f 13.7041
20 3.0938 3.9571 11.8867 re f Q
21 }

```

`\atfi@acroGraph` Draw `\atfi@acroGraph@data` in a box of the appropriate size.

```

22 \DeclareRobustCommand{\atfi@acroGraph}{%
23   \raisebox{-1.5bp}{\parbox[b][20bp]{22bp}{%
24     \rule{0pt}{0pt}\pdfliteral{\atfi@acroGraph@data}}}%
25   }%
26 }

```

`\atfi@acroPaperclip@data` Recreate Adobe Acrobat's Paperclip icon.

```

27 \newcommand{\atfi@acroPaperclip@data}{%
28   q 0.75 G 0 i 2.5 w 1 J 4 M 1.9619 11.7559 m 1.9619 3.3037
29   1.9619 2.5059 v 1.9619 1.707 4.0947 1.25 y 7.4141 1.25 1 9.4292
30   1.8223 9.4292 3.3066 v 9.4292 4.79 9.4292 16.8945 y 9.7852
31   18.1514 8.481 18.1514 v 7.1768 18.1514 5.1616 18.1514 y 3.8574
32   17.9209 3.8574 16.8945 v 3.8574 15.8652 3.8574 6.6172 y 4.3325
33   5.418 5.1025 5.418 v 5.8726 5.418 6.5845 5.418 y 7.6812 5.6455
34   7.6812 6.4736 v 7.6812 7.3027 7.6812 11.5264 y S 0 G 1.2495
35   12.4404 m 1.2495 3.9883 1.2495 3.1895 v 1.2495 2.3906 3.3833
36   1.9326 y 6.7026 1.9326 1 8.7178 2.5068 8.7178 3.9902 v 8.7178
37   5.4736 8.7178 17.5781 y 9.0732 18.834 7.769 18.834 v 6.4653
38   18.834 4.4497 18.834 y 3.146 18.6055 3.146 17.5781 v 3.146
39   16.5498 3.146 7.3018 y 3.6201 6.1016 4.3911 6.1016 v 5.1611
40   6.1016 5.873 6.1016 y 6.9692 6.3301 6.9692 7.1572 v 6.9692
41   7.9863 6.9692 12.21 y S \atfi@color@rgb\space RG 1 w
42   1.2495 12.4404 m 1.2495 3.9883 1.2495 3.1895 v 1.2495 2.3906
43   3.3833 1.9326 y 6.7026 1.9326 1 8.7178 2.5068 8.7178 3.9902 v
44   8.7178 5.4736 8.7178 17.5781 y 9.0732 18.834 7.769 18.834 v
45   6.4653 18.834 4.4497 18.834 y 3.146 18.6055 3.146 17.5781 v
46   3.146 16.5498 3.146 7.3018 y 3.6201 6.1016 4.3911 6.1016 v
47   5.1611 6.1016 5.873 6.1016 y 6.9692 6.3301 6.9692 7.1572 v
48   6.9692 7.9863 6.9692 12.21 y S Q
49 }

```

`\atfi@acroPaperclip` Draw `\atfi@acroPaperclip@data` in a box of the appropriate size.

```

50 \DeclareRobustCommand{\atfi@acroPaperclip}{%
51   \raisebox{-1.25bp}{\parbox[b][21bp]{12bp}{%
52     \rule{0pt}{0pt}\pdfliteral{\atfi@acroPaperclip@data}}}%
53   }%
54 }

```

`\atfi@acroPushPin@data` Recreate Adobe Acrobat's PushPin icon.

```

55 \newcommand{\atfi@acroPushPin@data}{%
56   q \atfi@color@rgb\space rg 0 G 1 w 1 6 m 11 6 1 11 13 1 12
57   13 1 14 11 1 21 11 1 22 12 1 23 12 1 23 2 1 22 2 1 21 3 1 14 3
58   1 12 1 1 11 1 1 11 6 1 B 0.5 G 0 7 m 10 7 1 10 8 1 1 8 1 S 1 G
59   12 12 m 14 10 1 22 10 1 22 11 1 S Q
60 }

```

`\atfi@acroPushPin` Draw `\atfi@acroPushPin@data` in a box of the appropriate size.

```
61 \DeclareRobustCommand{\atfi@acroPushPin}{%
62   \raisebox{-1.25bp}{\parbox[b][14bp]{24bp}{%
63     \rule{0pt}{0pt}\pdfliteral{\atfi@acroPushPin@data}}}%
64   }%
65 }
```

`\atfi@acroTag@data` Recreate Adobe Acrobat's Tag icon.

```
66 \newcommand{\atfi@acroTag@data}{%
67   q 0.5 g 10.0542 14.9873 m 24.27 14.9873 l 25.252 14.0059 l
68   25.252 1.1455 l 24.1064 0 l 9.9609 0 l 6.0327 6.0088 l 6.0327
69   9.002 l 10.0542 14.9873 l 9.3994 9.376 m 8.5215 9.376 7.8096
70   8.5596 7.8096 7.5527 c 7.8096 6.5449 8.5215 5.7285 9.3994
71   5.7285 c 10.2778 5.7285 10.9897 6.5449 10.9897 7.5527 c 10.9897
72   8.5596 10.2778 9.376 9.3994 9.376 c h f
73   \atfi@color@rgb\space rg 0 G 0 i 0.5 w 4 M 1 j 8.5107
74   16.5313 m 22.7266 16.5313 l 23.7085 15.5488 l 23.7085 2.6895 l
75   22.563 1.543 l 8.4175 1.543 l 4.4893 7.5527 l 4.4893 10.5449 l
76   8.5107 16.5313 l 7.856 10.9199 m 6.978 10.9199 6.2661 10.1035
77   6.2661 9.0957 c 6.2661 8.0879 6.978 7.2715 7.856 7.2715 c
78   8.7344 7.2715 9.4463 8.0879 9.4463 9.0957 c 9.4463 10.1035
79   8.7344 10.9199 7.856 10.9199 c h B 1 w 12.3291 12.2656 m
80   21.1206 12.2656 l S 12.3291 9.1797 m 21.1206 9.1797 l S 12.3291
81   6.1875 m 21.1206 6.1875 l S 0 G 0.5 w 0 9.0488 m 6.2661 9.0957
82   l S 1.4028 5.2148 m 1.4028 9.6094 l 1.6831 10.6387 2.4316
83   10.6387 v 3.6475 10.6387 3.5542 9.0488 y S Q
84 }
```

`\atfi@acroTag` Draw `\atfi@acroTag@data` in a box of the appropriate size.

```
85 \DeclareRobustCommand{\atfi@acroTag}{%
86   \raisebox{-1.6bp}{\parbox[b][17bp]{25bp}{%
87     \rule{0pt}{0pt}\pdfliteral{\atfi@acroTag@data}}}%
88   }%
89 }
```

4.4 Helper routines

`\atfi@temp@string` This is the same as `\pdfstringdef`, except that it *locally* defines its argument. For those of you who like analogies, `\atfi@pdfstringdef` is to `\def` as `\pdfstringdef` is to `\gdef`.

```
90 \def\atfi@temp@string{}
91 \DeclareRobustCommand{\atfi@pdfstringdef}[2]{%
92   \pdfstringdef\atfi@temp@string{#2}%
93   \edef#1{\atfi@temp@string}%
94 }
```

`\theatfi@embedfileobj` Embed a file as a PDF EmbeddedFile object and store its object number in `\atfi@embedfile`

```

95 \newcounter{atfi@embedfileobj}
96 \DeclareRobustCommand{\atfi@embedfile}[1]{%
97   \immediate\pdfobj stream attr {
98     /Type /EmbeddedFile
99     \atfi@mimetype
100   } file {#1}%
101   \setcounter{atfi@embedfileobj}{\pdflastobj}%
102 }

```

`\atfi@appearancewidth` Each PDF annotation can an associated “appearance”. In the `attachfile` package, we store the appearance with the `\atfi@set@appearance` macro (below).
`\atfi@appearanceheight` As a side effect, `\atfi@set@appearance` stores the dimensions of its argument in
`\atfi@appearancedepth` `\atfi@appearancewidth`, `\atfi@appearanceheight`, and `\atfi@appearancedepth`
`\theatfi@appearanceobj` `\atfi@appearanceobj` is the object number of the appearance XObject, and `\atfi@appearancebox` is a temporary storage location for the
`\atfi@appearancebox` T_EX box that will get converted to an XObject.

```

103 \newlength{\atfi@appearancewidth}
104 \newlength{\atfi@appearanceheight}
105 \newlength{\atfi@appearancedepth}
106 \newcounter{atfi@appearanceobj}
107 \newsavebox{\atfi@appearancebox}

```

`\atfi@set@appearance` Store the argument as a PDF XObject, for later referral by the file annotation’s appearance dictionary. This serves two purposes:

1. It enables a T_EX box with arbitrary contents to serve as the file attachment icon.
2. It enables (generally, older) PDF viewers which don’t recognize the icon name to still display something meaningful.

```

108 \DeclareRobustCommand{\atfi@set@appearance}[1]{%
109   \savebox{\atfi@appearancebox}{#1}%
110   \settowidth{\atfi@appearancewidth}{\usebox{\atfi@appearancebox}}%
111   \settoheight{\atfi@appearanceheight}{\usebox{\atfi@appearancebox}}%
112   \settodepth{\atfi@appearancedepth}{\usebox{\atfi@appearancebox}}%
113   \immediate\pdfxform attr {
114     /Subtype /Form
115   } \atfi@appearancebox
116   \setcounter{atfi@appearanceobj}{\pdflastxform}%
117 }

```

`\atfi@flags@to@int` Convert all our flag options from booleans into a single integer (`atfi@flags`).

```

\theatfi@flags 118 \newcounter{atfi@flags}
119 \DeclareRobustCommand{\atfi@flags@to@int}{%
120   \setcounter{atfi@flags}{0}%
121   \ifatfi@print
122     \addtocounter{atfi@flags}{4}%
123   \fi%

```

```

124 \ifatfi@zoom
125 \else
126   \addtocounter{atfi@flags}{8}%
127 \fi%
128 }

```

`\atfi@insert@file@annot` Insert a PDF FileAttachment annotation that refers to the object created by `\atfi@embedfile`. TeX doesn't normally "see" a `\pdfannot`, so we have to explicitly allocate space for it. `\atfi@insert@file@annot` takes one argument, the name of the file to attach. This should be the same value that was passed to `\atfi@embedfile`.

```

129 \DeclareRobustCommand{\atfi@insert@file@annot}[1]{%
130   \rule{0pt}{0pt}%
131   \atfi@pdfstringdef\atfi@file{#1}%
132   \ifatfi@appearance

```

We currently use the same appearance for Normal, Rollover, and Down, although future versions of `attachfile` may provide support for different appearances. Although the PDF specification claims that R and D appearances default to the N appearance, experience dictates otherwise. Hence, we explicitly specify all three appearances.

```

133   \def\atfi@appearance@dict{%
134     /AP <<
135       /N \theatfi@appearanceobj\space 0 R
136       /R \theatfi@appearanceobj\space 0 R
137       /D \theatfi@appearanceobj\space 0 R
138     >>%
139   }%
140   \fi%
141   \pdfannot width \atfi@appearancewidth
142             height \atfi@appearanceheight
143             depth \atfi@appearancedepth {
144     /Subtype /FileAttachment
145     \atfi@icon\space
146     \atfi@color\space
147     \atfi@author\space
148     \atfi@date\space
149     \atfi@description\space
150     \atfi@subject\space
151     \atfi@appearance@dict\space
152     /F \theatfi@flags\space
153     /FS <<
154       /Type /Filespec
155       /F (\atfi@file)
156     /EF <<
157       /F \theatfi@embedfileobj\space 0 R
158     >>
159   >>
160   }%

```

Now, so TeX can budget space for the annotation, we insert some zero-width rules into the document.

```
161 \rule{0pt}{\atfi@appearanceheight}%
162 \rule[-\atfi@appearancedepth]{0pt}{\atfi@appearancedepth}%
163 \rule{\atfi@appearancewidth}{0pt}%
164 }
```

`\atfi@attachfile` This macro does all the work of the `\attachfile` author command. `\attachfile` began a group in which most special characters are set to category code “other”. `\atfi@attachfile` reads the filename within this group, embeds the corresponding file into the generated PDF file, and places an icon at the current location. Then, it ends the group, thereby restoring the original category codes.

```
165 \def\atfi@attachfile#1#2{%
166     \setkeys{AtFi}{#1}%
167     \atfi@embedfile{#2}%
168     \atfi@set@appearance{\csname atfi@acro\atfi@icon@icon\endcsname}%
169     \atfi@flags@to@int%
170     \atfi@insert@file@annot{#2}%
171     \endgroup
172 }
```

`\atfi@textattachfile` All this macro does is evaluate its second argument (a filename) within the group begun by `\textattachfile` then pass control to `\atfi@textattachfile@i`, which does all the work. `\atfi@textattachfile` is needed to force the filename to be evaluated while special characters are set to use category code “other”.

```
173 \def\atfi@textattachfile#1#2{%
174     \endgroup
175     \atfi@textattachfile@i{#1}{#2}%
176 }
```

`\atfi@textattachfile@i` This macro does all the work of the `\textattachfile` author command. Given a filename, some arbitrary text, and an optional set of attachment options, embed the corresponding file into the generated PDF file, and use the text as the icon. We recycle the icon color for the text. Note that the `\strut` is a bug workaround; I don’t know whose fault this is, but the bottom point or so of the text seems to get cut off. Weird.

`\atfi@textcolor`

```
177 \def\atfi@textattachfile@i#1#2#3{%
178     \setkeys{AtFi}{#1}%
179     \atfi@embedfile{#2}%
180     \def\atfi@textcolor(##1 ##2 ##3)##4{%
181         \textcolor[rgb]{##1,##2,##3}{##4}%
182     \atfi@set@appearance{%
183         \expandafter\atfi@textcolor\expandafter
184         (\atfi@color@rgb){#3\strut}}%
185     \atfi@flags@to@int
186     \atfi@insert@file@annot{#2}%
187     \endgroup
188 }
```

4.5 Annotation option processing

We start by defining the various options that `\attachfile` accepts and their default values.

`\atfi@mimetype` Declare the MIME type of the attached file. For example, “text/plain” would specify that the attachment is an ordinary text file.

```
189 \def\atfi@mimetype{}
190 \define@key{AtFi}{mimetype}{%
191   \atfi@pdfstringdef\atfi@mimetype{#1}%
192   \edef\atfi@mimetype{/Subtype (\atfi@mimetype)}%
193 }
```

`\atfi@icon` Specify an icon to represent the attachment. This should be one of Graph, Paperclip, PushPin (the default), or Tag. `\atfi@icon` is an attribute/value pair that gets inserted directly into the file attachment object. `\atfi@icon@icon` is only the icon name itself and is used to insert a static graphic that represents Adobe Acrobat’s rendition of a file attachment icon.

```
194 \define@key{AtFi}{icon}{%
195   \def\atfi@icon{/Name /#1}%
196   \def\atfi@icon@icon{#1}%
197 }
198 \setkeys{AtFi}{icon=PushPin}
```

`\atfi@color` Specify the color of the attachment icon as an RGB triplet. For example, “0 0.3 0” would be a fairly dark green. `\atfi@color` is an attribute/value pair that gets inserted directly into the file attachment object. It defaults to the empty string, which means the PDF viewer gets to choose what color the icon should be. `\atfi@color@rgb` is only the RGB triplet itself and is used to insert a static graphic that represents Adobe Acrobat’s rendition of a file attachment icon. It defaults to a beige color.

```
199 \define@key{AtFi}{color}{%
200   \def\atfi@color{/C [#1]}%
201   \def\atfi@color@rgb{#1}%
202 }
203 \setkeys{AtFi}{color=1 0.9255 0.7765}
```

`\atfi@author` Specify the author of the annotation. Adobe Acrobat shows this when you right-click on the annotation and choose *Properties*.

```
204 \def\atfi@author{}
205 \define@key{AtFi}{author}[]{%
206   \edef\atfi@author{/T (#1)}%
207 }
```

`\atfi@pad@ii` Pad a number to exactly two digits. This is used by `\atfi@date` (below).

```
208 \def\atfi@pad@ii#1{%
209   \ifnum#1>9
210     \the#1%
```

```

211 \else
212     0\the#1%
213 \fi%
214 }

\atfi@timezone Specify the timezone to attach to the file modification date. It would be awfully
                nice if TeX had some way to produce this automatically. (Does it?)
215 \def\atfi@timezone{}
216 \define@key{AtFi}{timezone}{\def\atfi@timezone{#1}}

\atfi@time The date the annotation was last modified. It's unlikely you'd want to specify
\c@atfi@hours this explicitly in your LATEX document, but if you want to, you can. Seconds are
\theatfi@hours hardwired to zero, and the time zone must be manually specified. (I don't believe
\c@atfi@minutes TeX makes either of those available.) Note that \time is stored in \atfi@time
\atfi@date in case the minutes roll over during the time calculations. I was too lazy to do
                the same for \day, \month, and \year, so don't process your LATEX document at
                midnight if you want to get a correct datestamp.
217 \edef\atfi@time{\time}
218 \newcounter{atfi@hours}
219 \setcounter{atfi@hours}{\atfi@time/60}
220 \newcounter{atfi@minutes}
221 \setcounter{atfi@minutes}{\atfi@time-\theatfi@hours*60}
222 \def\atfi@date{%
223     /M (D:\the\year%
224         \atfi@pad@ii\month%
225         \atfi@pad@ii\day%
226         \atfi@pad@ii\c@atfi@hours%
227         \atfi@pad@ii\c@atfi@minutes
228         00%
229         \atfi@timezone)%
230 }
231 \define@key{AtFi}{date}{%
232     \atfi@pdfstringdef\atfi@date{#1}%
233     \edef\atfi@date{/M (\atfi@date)}%
234 }

\atfi@description Store the annotation's description. Adobe Acrobat shows this when you right-click
                  on the annotation and choose Properties. It also shows it in the Annotations tab
                  once you "Rescan Document".
235 \def\atfi@description{}
236 \define@key{AtFi}{description}{%
237     \atfi@pdfstringdef\atfi@description{#1}%
238     \edef\atfi@description{/Contents (\atfi@description)}%
239 }

\atfi@subject Store the annotation's subject. Adobe Acrobat shows this when you right-click
              on the annotation and choose Properties. It also shows it in the Annotations tab
              once you "Rescan Document".

```



```

240 \def\atfi@subject{}
241 \define@key{AtFi}{subject}{%
242   \atfi@pdfstringdef\atfi@subject{#1}%
243   \edef\atfi@subject{/Subj (\atfi@subject)}%
244 }

```

`\ifatfi@print` By default, file annotation icons print along with the rest of the document. (In Adobe Acrobat, that's the case if and only if the Annotations box is checked in the Print dialog.) By setting `print=false`, the icons will not print.

```

245 \newif\ifatfi@print
246 \atfi@printtrue
247 \define@key{AtFi}{print}[true]{\csname atfi@print#1\endcsname}

```

`\ifatfi@zoom` By default, file annotation icons zoom along with the rest of the document. By setting `zoom=false`, the icons will remain at a constant size, regardless of magnification.

```

248 \newif\ifatfi@zoom
249 \atfi@zoomtrue
250 \define@key{AtFi}{zoom}[true]{\csname atfi@zoom#1\endcsname}

```

`\ifatfi@appearance` The `attachfile` package normally embeds an icon graphic in each file attachment annotation's appearance dictionary. By setting `appearance=false`, no appearance dictionary will be added to a file attachment annotation; the PDF viewer will need to decide for itself how to display the icon.

```

251 \newif\ifatfi@appearance
252 \atfi@appearancetrue
253 \def\atfi@appearance@dict{}
254 \define@key{AtFi}{appearance}[true]{\csname atfi@appearance#1\endcsname}

```

4.6 Author commands

The commands described in this section are those available to the user writing a \LaTeX document. If the macros seem too simple, it's because all the work is performed by the helper routines in Section 4.4 and the option-processing routines in Section 4.5.

`\attachfilesetup` Set default values for all the various annotation options.

```

255 \DeclareRobustCommand{\attachfilesetup}[1]{\setkeys{AtFi}{#1}}

```

`\attachfile` Given a filename and an optional set of attachment options, embed the corresponding file into the generated PDF file, and place an icon at the current location. The real work is performed by `\atfi@attachfile`. `\attachfile` merely sets up the category codes in such a way as to allow filenames to contain special characters such as underscores.

```

256 \DeclareRobustCommand{\attachfile}[1][{}]{%
257   \begingroup
258     \let\do\@makeother
259     \dospecials

```

```

260 \catcode'\{=1\relax
261 \catcode'\}=2\relax
262 \atfi@attachfile{#1}%
263 }

```

\textattachfile Given a filename, some arbitrary text, and an optional set of attachment options, embed the corresponding file into the generated PDF file, and use the text as the icon. After setting up the category codes to use for processing the filename, **\textattachfile** passes to control to **\atfi@textattachfile**, which resets the category codes, and then to **\atfi@textattachfile@i**, which does all the work. We define two groups: one for keeping the attachment options local and one for temporarily altering category codes.

```

264 \DeclareRobustCommand{\textattachfile}[1][{}]{%
265 \begingroup
266 \begingroup
267 \let\do\@makeother
268 \dospecials
269 \catcode'\{=1\relax
270 \catcode'\}=2\relax
271 \atfi@textattachfile{#1}%
272 }

```

\noattachfile Insert the same icon into the document that we would for an **\attachfile** call. This is useful for writing documentation that instructs a user on how to deal with file attachments. **\noattachfile** is fairly simple; is just calls **\setkeys** in order to get the latest values of **\atfi@icon@icon** and **\atfi@color@rgb**, and then it defers to one of **\atfi@acroGraph**, **\atfi@acroPaperclip**, **\atfi@acroPushPin**, or **\atfi@acroTag**, which do the actual rendering work.

```

273 \DeclareRobustCommand{\noattachfile}[1][{}]{%
274 \begingroup
275 \setkeys{AtFi}{#1}%
276 \ifatfi@print
277 \csname atfi@acro\atfi@icon@icon\endcsname
278 \else
279 \setbox0=\hbox{\csname atfi@acro\atfi@icon@icon\endcsname}%
280 \makebox[\wd0]{}%
281 \fi
282 \endgroup
283 }

```

\notextattachfile Insert the same text into the document that we would for a **\textattachfile** call. This is useful for writing documentation that instructs a user on how to deal with file attachments.

```

284 \DeclareRobustCommand{\notextattachfile}[2][{}]{%
285 \begingroup
286 \setkeys{AtFi}{#1}%
287 \ifatfi@print
288 \def\atfi@textcolor{##1 ##2 ##3}##4{%

```

```

289     \textcolor[rgb]{##1,##2,##3}{##4}}%
290     \expandafter\atfi@textcolor\expandafter
291     (\atfi@color@rgb){#2\strut}%
292   \else
293     \setbox0=\hbox{#2\strut}%
294     \makebox[\wd0]{}%
295   \fi
296 \endgroup
297 }

```

4.7 Dummy commands

If the author is not use pdfL^AT_EX or not using it in PDF-generating mode, we replace the core `attachfile` commands with dummy versions so L^AT_EX can at least run to completion.

```

298 \ifpdf
299 \else

```

`\atfi@dummy@pushpin` Define an empty space of approximately the same size as `\atfi@acroPushPin`.

```

300 \def\atfi@dummy@pushpin{%
301   \raisebox{-1.25bp}{\parbox[b][14bp]{24bp}{}}%
302 }

```

`\textattachfile` Define a dummy `\textattachfile` in terms of `\notextattachfile`.

```

303 \DeclareRobustCommand{\textattachfile}[3][]{%
304   \notextattachfile[#1]{#3}%
305 }

```

`\noattachfile` Define a dummy `\noattachfile` in terms of `\notextattachfile`.

```

306 \DeclareRobustCommand{\noattachfile}[1][]{%
307   \notextattachfile[#1]{\atfi@dummy@pushpin}%
308 }

```

`\attachfile` Define a dummy `\attachfile` in terms of the dummy `\noattachfile`.

```

309 \DeclareRobustCommand{\attachfile}[2][]{%
310   \noattachfile[#1]%
311 }

```

```

312 \fi

```

```

313 \</package>

```

5 Future work

The following are some avenues for future work on `attachfile`. First, `attachfile` supports only pdfL^AT_EX for generating PDF files. It would be nice if it supported all the backends that `hyperref` supports: dvipdfm, dvips with pdfmarks, V_T_EX,

and so forth. Along those same lines, a “draft” package option would be a welcome addition, for use when PDF is not the final output format.

Second, PDF supports platform-specific file attachments. That is, a file attachment icon can represent a different file when activated on Windows, Unix, or MacOS. It might be nice for `attachfile` to support that feature.

Finally, I’d like to see `attachfile` expand sometime to support *all* the various PDF annotations: `Sound`, `Movie`, `Stamp`, `Ink`, `Popup`, etc.

Of course, I make no promises that I’ll ever do *any* of the above. `attachfile` was just something I wrote in my spare time, and it’s unlikely I’ll be able to devote another large block of time to enhance it.

References

- [1] Adobe Systems Incorporated. *PDF Reference Version 1.6*. Adobe Press, fifth edition, December 3, 2004. ISBN 0321304748. Available from <http://partners.adobe.com/public/developer/en/pdf/PDFReference16.pdf>.
- [2] N. Freed and N. Borenstein. Multipurpose Internet Mail Extensions (MIME) part two: Media types. Request for Comments (RFC) 2046, Internet Engineering Task Force (IETF), Network Working Group, November 1996. Available from <http://www.rfc-editor.org/rfc/rfc2046.txt>.
- [3] Internet Assigned Numbers Authority. MIME media types. Available from <http://www.iana.org/assignments/media-types/>.

Change History

v1.0	notation	16
General: Initial version	<code>\noattachfile</code> : Modified to leave	
v1.1	space on the page when	
General: Completely restructured	<code>print=false</code> is passed as an	
the <code>.dtx</code> file	option	18
Wrote dummy versions of all the	<code>\notextattachfile</code> : Created this	
core macros to use in the ab-	function	18
sence of pdfL ^A T _E X running in	v1.1a	
PDF-generating mode.	General: Corrected a few stupid	
<code>\atfi@file</code> : Added explicit	bugs	1
Rollover and Down appearances	v1.2	
to work around browser bugs .	General: Modified so as to en-	
<code>\atfi@subject</code> : Added support for	able filenames to contain special	
specifying the subject of an an-	characters, e.g., underscores . . .	1

Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

Symbols	
<code>\@makeother</code>	258, 267
<code>\{</code>	260, 269
<code>\}</code>	261, 270
A	
Adobe Acrobat	2, 4–11, 15–17
Reader	8
appearance (option)	4–5, 8
<code>\atfi@acroGraph</code>	22
<code>\atfi@acroGraph@data</code>	14, 24
<code>\atfi@acroPaperclip</code>	50
<code>\atfi@acroPaperclip@data</code>	27, 52
<code>\atfi@acroPushPin</code>	61
<code>\atfi@acroPushPin@data</code>	55, 63
<code>\atfi@acroTag</code>	85
<code>\atfi@acroTag@data</code>	66, 87
<code>\atfi@appearance@dict</code> ..	133, 151, <u>251</u>
<code>\atfi@appearancebox</code> ..	103, 109–112, 115
<code>\atfi@appearancedepth</code>	
.....	103, 112, 143, 162
<code>\atfi@appearancefalse</code>	251
<code>\atfi@appearanceheight</code>	
.....	103, 111, 142, 161
<code>\atfi@appearancetrue</code>	251
<code>\atfi@appearancewidth</code>	
.....	103, 110, 141, 163
<code>\atfi@attachfile</code>	165, 262
<code>\atfi@author</code>	147, <u>204</u>
<code>\atfi@color</code>	146, <u>199</u>
<code>\atfi@color@rgb</code>	
....	18, 41, 56, 73, 184, <u>199</u> , 291
<code>\atfi@date</code>	148, <u>217</u>
<code>\atfi@description</code>	149, <u>235</u>
<code>\atfi@dummy@pushpin</code>	300, 307
<code>\atfi@embedfile</code>	95, 167, 179
<code>\atfi@file</code>	129
<code>\atfi@flags@to@int</code>	118, 169, 185
<code>\atfi@icon</code>	145, <u>194</u>
<code>\atfi@icon@icon</code> ...	168, <u>194</u> , 277, 279
<code>\atfi@insert@file@annot</code> ..	129, 170, 186
<code>\atfi@mimetype</code>	99, <u>189</u>
<code>\atfi@pad@ii</code>	208, 224–227
<code>\atfi@pdfstringdef</code>	
.....	90, 131, 191, 232, 237, 242
<code>\atfi@printfalse</code>	<u>245</u>
<code>\atfi@printrtrue</code>	<u>245</u>
<code>\atfi@set@appearance</code> ..	108, 168, 182
<code>\atfi@subject</code>	150, <u>240</u>
<code>\atfi@temp@string</code>	90
<code>\atfi@textattachfile</code>	173, 271
<code>\atfi@textattachfile@i</code>	175, <u>177</u>
<code>\atfi@textcolor</code>	177, 288, 290
<code>\atfi@time</code>	<u>217</u>
<code>\atfi@timezone</code>	<u>215</u> , 229
<code>\atfi@zoomfalse</code>	<u>248</u>
<code>\atfi@zoomtrue</code>	<u>248</u>
<code>\attachfile</code>	3, <u>256</u> , <u>309</u>
attachfile (package) ..	2–9, 12, 13, 17, 19, 20
<code>\attachfilesetup</code>	4, <u>255</u>
author (option)	5, 8
B	
BIB _T E _X	2
C	
<code>\c@atfi@hours</code>	217
<code>\c@atfi@minutes</code>	217
calc (package)	7
color (option)	5, 8
color (package)	7
D	
date (option)	5, 8
<code>\day</code>	225
<code>\define@key</code>	190, 194, 199, 205,
216, 231, 236, 241, 247, 250, 254	
description (option)	5–6, 8
DVI	9
dvipdfm	9, 19
dvips	9, 19
E	
EmbeddedFile	11
F	
FileAttachment	4, 13

G		
GMT	7	
Graph	6, 9, 15	
H		
hyperref (package)	2, 7, 9, 19	
I		
icon (option)	6, 8	
\ifatfi@appearance	132, <u>251</u>	
\ifatfi@print	121, <u>245</u> , 276, 287	
\ifatfi@zoom	124, <u>248</u>	
\ifpdf	3, 298	
ifpdf (package)	7	
lnk	20	
K		
keyval (package)	7	
L		
L ^A T _E X	2, 5, 7–9, 16, 17, 19	
M		
MIME	6, 15	
mimetype (option)	6–8	
\month	224	
Movie	20	
MPEG	6	
N		
\noattachfile	3, 273, 306, 310	
\notextattachfile	3–4, <u>284</u> , 304, 307	
O		
options		
appearance	4–5	
prevopt	8	
author	5	
prevopt	8	
color	5	
prevopt	8	
date	5	
prevopt	8	
default values	8	
description	5–6	
prevopt	8	
icon	6	
prevopt	8	
mimetype	6–7	
prevopt	8	
prevopt	8	
print	7	
prevopt	8	
subject	6	
prevopt	8	
timezone	7	
prevopt	8	
zoom	7	
P		
\PackageWarningNoLine	5	
Paperclip	6, 9, 10, 15	
PDF	1–9, 11–15, 17–20	
\pdfannot	141	
\pdflastobj	101	
\pdflastxform	116	
pdfL ^A T _E X	2, 8, 9, 19, 20	
\pdfliteral	24, 52, 63, 87	
pdfmarks	9, 19	
\pdfobj	97	
\pdfstringdef	92	
\pdfxform	113	
Popup	20	
print (option)	7–8	
PushPin	6, 9, 10, 15	
R		
\RequirePackage	2, 10–12	
\RequirePackageWithOptions	13	
RGB	15	
S		
Sound	20	
Stamp	20	
subject (option)	6, 8	
T		
Tag	6, 9, 11, 15	
T _E X	4, 5, 7, 12–14, 16	
\textattachfile	3, <u>264</u> , <u>303</u>	
\textcolor	181, 289	
\theatfi@appearanceobj	<u>103</u> , 135–137	
\theatfi@embedfileobj	<u>95</u> , 157	
\theatfi@flags	<u>118</u> , 152	
\theatfi@hours	<u>217</u>	
\time	217	
timezone (option)	7–8	
U		
Universal Time	7	

	V		Y
V _{TeX}	9, 19	\year	223
	W		
WYSIWYG	2		
	X		Z
XObject	12	zoom (option)	7–8