

DVIview

by

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Documentation for
DVIview version 1.02

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DVIview allows you to view and print `dvi` files such as those generated by `TEX` and `LATEX`. It allows the inclusion of Draw, sprite and JPEG files in `TEX` and `LATEX` documents.

DVIview supports interactive help (via Acorn's `!Help` application) so you should be able to use it without reading this manual. However, the interactive help window is so small and I like to waffle :-)

Despite incorporating a vast array of complicated features, DVIview is completely free.

1 Loading a file

A `dvi` file can be loaded by double-clicking on it or by dragging it or the directory in which it resides onto the DVIview icon on the icon bar. If you drag a directory, the `dvi` file inside it *must* be called `dvi`.

DVIview scans the document (which may take a few seconds for large documents) and then loads and displays the first page. DVIview's virtual memory system ensures that pages are only loaded into memory when they are being viewed on screen and so you can preview very large documents without needing that 256Mb Risc PC you had your eye on.

2 Viewing a document

Once loaded, the first page of the document is displayed in a window. You can move to different pages using the **Next**, **Previous** and, for larger jumps, **Goto page** items from the window's menu (see figure 1).

Figure 1: The view menu

Figure 2: The document submenu

The scale at which the document is displayed can be altered by choosing **Scale** and using the standard ‘scale view’ dialogue box.

The other items in the menu are **New view**, which, unsurprisingly, spawns a new view on the document, and **Save page**, which saves as a Draw file the page being viewed.

At the top of the menu is the **Document** item, which leads to a submenu whose items concern the document as a whole rather than the page currently being viewed (see figure 2). **File info** leads to the standard file information dialogue box. **Save** allows a range of pages to be saved as separate Draw files in a directory. It will come as a great shock to discover that **Print** allows pages to be printed¹. **Paper size** allows you to choose the size of the paper for your document (more on this in sections 9 and 6) and choosing **Landscape** toggles the orientation of the paper. Finally, **Page offsets** allows you to alter the position of the document pages on the paper; negative values are allowed. Try spawning several new views of a document and then changing the page offsets — whee!

3 Keyboard shortcuts

There are various keyboard shortcuts available:

$\wedge \uparrow$	Move to the start of the document
Home	Move to the start of the document
$\wedge \downarrow$	Move to the end of the document
Page Up	Move to previous page
Page Down	Move to next page
$\leftarrow \rightarrow \uparrow \downarrow$	Scroll around current page
Print	Guess :-)
F3	Save the page as a Draw file
\uparrow F3	Save a range of pages as Draw files
F11	Scale the page
F5	Goto page
\wedge M	Open the magnifier

If you would like other keyboard shortcuts then please ask.

4 The log window

When you load your document, **DVIview**’s log window will open if there are any warnings or non-serious errors.

DVIview could (and used to) report problems using the RISC OS error reporting system but this means you have to click on **OK** for every message.

¹I was being sarcastic but it *will* be a shock to long-time users who had probably given up hope of ever seeing a working print option in **DVIview**.

To make your previewing experience as smooth and pleasurable as possible :-), `DVIview` quietly gathers the warnings and errors up for you as you preview your document.

Messages are automatically ordered by document and page number so you can preview the document pages in any order you like but have a sorted list of problems at the end.

The log window primarily gathers problems to do with fonts and `special` commands and also lists font substitutions.

When you close the log window all messages are discarded; the window will re-open whenever a new problem arises.

5 The magnifier

The magnifier shows a magnified view of a page. You can open the magnifier by clicking on `DVIview`'s icon bar icon or choosing **Magnifier...** from the page view's menu.

The magnifier shows the part of the page underneath the pointer (it's blank if there is no page underneath the pointer). The magnifier's menu allows you can change the scale at which the page is displayed and its **Save choices** option saves the scale and the position and size of the magnifier for use in future sessions with `DVIview`.

6 Printing

6.1 TOYWWSLOSO printing — the hype :-)

From version 1.00, `DVIview` has real TOYWWSLOSO printing (get ready for the hype :-)).

Fed up with setting loads of stupid options when you want to print a pamphlet or use a paper size that's different to your document's? Fear not! Unlike lesser programs (i.e. everyone else's :-)) `DVIview` features the amazing TOYWWSLOSO printing system. All the complicated printing options you could want without setting up loads of stupid options!!!!!!². Look at how it works:

- **Printing A4 pages on A4 paper**
Simply click on **Print**.
- **Printing A5 pages on A4 paper**
Simply click on **Print**.
- **Printing A4 pages on A4 paper as an A5 booklet**
Click on **Two-up** then click on **Print**.
- **Printing landscape A5 pages on upright A4 paper as a landscape A5 booklet**
Click on **Two-up** then click on **Print**.
- **Printing four landscape A5 pages on each upright A4 paper to form a landscape A6 booklet**
Click on **Four-up** then click on **Print**.

Whatever your document paper size, your printer paper size and your printing requirements, TOYWWSLOSO printing automatically works out how you want your output to look without you having to set loads of stupid options.

²All the best features have at least six exclamation marks.

Figure 3: The print dialogue box

6.2 Printing from DVIVIEW — the fine print

Printing from DVIVIEW has several advantages over other T_EX printing systems. Firstly, DVIVIEW prints via the !Printers application so it can print to a very wide range of printers. Secondly, you can include Draw files, sprites and JPEGs in your documents. Finally, DVIVIEW has a number of printing options so you can print documents just as you want them: double sided, as a pamphlet (2-up or 4-up) or as a ‘thumbnail’ print to get an overview. You can also print multiple copies and have them collated if you wish.

DVIVIEW uses sophisticated techniques to provide advanced print facilities with an extremely easy-to-use user interface. The printing interface doesn’t include scaling or orientation options because DVIVIEW chooses the most sensible choices for these based on the printer’s paper size, the document paper size and the other options you have selected. There is no ‘reverse’ option because DVIVIEW will intelligently order the paper for you.

6.2.1 Getting started

When you first use DVIVIEW, you should set the options in the **Printer characteristics** group and then click on **Save** to permanently store this choice.

Choose **Printer prints face up** if paper leaves your printer with its printed side facing up.

Choose **Straight paper path** if paper travels through your printer along a straight(ish) route. It should enter the printer on one side and leave on the other. Many printers have a U-shaped path where the paper leaves the printer on the same side that it enters; often the out-tray is immediately above the in-tray. Don’t choose the **Straight paper path** option if your printer has a U-shaped path.

These choices allow DVIVIEW to print sheets in a sensible order (something that, otherwise, can be difficult to get right with double-sided printing).

6.2.2 The print dialogue box

Figure 3 shows the print dialogue box. The various options are:

All pages Specifies that all pages in the document will be printed.

From page This specifies the range of pages to print. `DVIview` will print all the sheets of paper that contain the pages in the range. For example, if you're printing 2 pages per side and you specify the range 2 to 3, `DVIview` will print the sheet with pages 1 and 2 on and the sheet with pages 3 and 4 on. This is particularly useful if you need to re-print one sheet from a pamphlet print: just pick one page on the sheet to put in the range and `DVIview` will print the sheet you want (including the second side, if you've chosen to print on both sides).

Copies Guess :-)

Print on both sides Tick this if you want to print double-sided. `DVIview` will print one side of the paper and then prompt you to replace the paper in the in-tray.

Collate Select this if you're printing multiple copies but think twice if you're using a Postscript printer. When selected, pages are printed in the order 1,2,3... 1,2,3..., which is usually what you want. Without it selected, pages are printed in the order 1,1,1,1... 2,2,2,2..., which might seem silly but it's much faster for a Postscript printer to print like this.

Pause between sheets Left as an exercise for the reader :-)

Print types There are three main styles of printing:

1 page/sheet This is the usual print type.

***n* pages/sheet** These are 'thumbnail' prints and give you an overview of your document. They simply fit a number of pages on each sheet. So, you might get pages 1,2,3,4 on the first sheet and 5,6,7,8 on the next.

Pamphlet These print types print pages in such a way that the paper can be folded up to produce a booklet. Two-up printing puts 2 pages on each sheet so, by folding the sheet in half, you can make, say, A4 sheets into an A5 booklet. Two-up printing would normally be used with **Print on both sides** ticked. Four-up printing puts 4 pages on each sheet. Sheets are folded into quarters to make a booklet (and it's great fun working out how to fold the sheets :-)).

Printer prints face up Explained in section 6.2.1

Straight paper path Explained in section 6.2.1

6.3 Hints and tips for printing

This section has a few hints and tips for successful printing using `DVIview`.

6.3.1 How can I print an A5 page on A4 paper without it being scaled?

`DVIview` automatically scales your document pages to fit on the paper size you're actually using in your printer. If you don't want scaling then select the same paper size for your document as is selected for the printer and use the page offset dialogue to position your pages on that paper. When you print, `DVIview` will see that the pages and the printer paper are the same size and so won't scale.

6.3.2 I'm losing the edges of my pages when I print pamphlets

Some printers (especially inkjets) have quite large paper margins and pamphlet printing tends to bring pages close to the edge of the paper. In four-up printing you can avoid losing the tops of your pages by moving the pages down using the page offsets dialogue. However, losing page edges with other print types cannot be solved like this³.

The alternative way to avoid the problem is to reduce the scale of the pages slightly. To alter the scaling, create a new paper size that is slightly larger than the printer paper you're using and select that paper size for your document, positioning the pages using the page offset dialogue. DVIVIEW will scale the pages to fit the printer paper and so will scale them down (hopefully enough to avoid the margins).

6.4 Turbodrivers :-)

Computer Concepts' Turbdriver software does not like the T_EX outline fonts. It is very slow at rendering the fonts (slower than the Acorn font manager) and it tends to miss out small characters.

Computer Concepts didn't seem to care when I informed them of the problem so it probably won't be fixed in future releases unless large numbers of people pester them. Fortunately, there is a fix. You can disable the CC font system (and use the Acorn system instead) by turning off text halftoning. Do this by opening the printer configuration window (Shift-Select on the printer icon), clicking on the **Set** button next to the halftone field, then un-ticking the 'Halftone: text' option and clicking on **OK**.

7 Including diagrams in your documents

DVIVIEW can include draw files, sprites and JPEGs⁴ in your T_EX and L^AT_EX documents. To include a diagram simply put the line

```
\special{DVIVIEW_diagram filename}
```

at the point where you want the top-left of the diagram to appear. You can use the symbol '@' to represent the directory that the dvi file is in i.e.

```
\special{DVIVIEW_diagram @.Diagrams.Picture}
```

in the file \$.Report.dvi would include the file \$.Report.Diagrams.Picture.

DVIVIEW allows you to scale and crop your diagrams. To do so, simply add one or both of these commands after the file name in the **special** command above:

crop *left right top bottom* This crops an amount from each edge of the diagram.

The amounts are specified in draw units (there are 46080 draw units in an inch, 18142 in a centimetre) and may be negative in which case extra white space is added to the edge of the diagram.

scale *x-scale y-scale* This scales the diagram in the x and y directions. The scales are numbers representing percentages.

For example:

```
\special{DVIVIEW_diagram @.Picture scale 50 50}
```

³I may add an automatic system for positioning pages in order to avoid the paper margins — please pester me if you'd like this feature.

⁴JPEGs are only supported if you have the SpriteExtend module v0.99 or later (this module is provided in ROM with RISC OS 3.6 or later).

Figure 4: The author — A self portrait

Note that scaling is performed before cropping, so if you crop 2cm from the left-hand edge of a diagram scaled to 50%, it will remove 2cm from the diagram you see on screen rather than 1cm.

Also, for compatibility with TechWriter, a border of 512 draw units is placed around each diagram. You'll need to take this into account for precise cropping.

In `DVIview.tex`, there is a macro `\diagram{width}{height}{filename [optional commands]}` that will make space for and include a diagram in a \LaTeX document if you give it the size of the diagram. As an example see figure 4.

It would make life much easier if this macro could read the bounding box of the diagram. Unfortunately, I don't know if this is possible so if there are any wizards out there who can help me then please get in contact.

7.1 Diagrams — hints, tips and limitations

If you'd like to use the \TeX fonts in your Draw diagrams then you can but you'll have to use `!Chars` to input the characters. The characters in the current set of outline fonts are not laid out according to the ASCII character set.

Currently, there is only tentative support for text areas in Draw diagrams. They should be drawn correctly but they will not save correctly and they may not print correctly on Postscript printers. Please let me know if you'd like text areas to be better supported.

The Draw file format has no provisions for cropping objects so saving a `dvi` page as a Draw file is difficult if the page includes cropped diagrams. `DVIview` attempts cropping by obscuring the diagrams with white rectangles, however, this cannot deal with all cases. `DVIview` will never obscure part of a diagram that it should be possible to see but it may allow cropped parts of the diagram to be visible (and these may obscure other diagrams). In general, this is not likely to be a problem unless you crop off large areas and have several diagrams to a page. Remember, this is only a problem for saving pages: on-screen viewing and printing will be fine.

8 Choices

The choices dialogue box (see figure 5) is available from the icon bar menu. It allows you to set the default page magnification and positioning applied to documents when they are loaded.

There are four action buttons: **Set** implements the choices for the current session, **Save** implements the choices for this and future sessions, **Cancel** resets the choices displayed to those currently in use and **Default** sets the choices displayed to the last saved set of choices.

Figure 5: The choices dialogue box

Figure 6: Editing paper sizes

The choices are saved in a file called **Choices** in the **DVIVIEW** directory. However, this is not particularly useful for those of you wanting to use **DVIVIEW** on a network or from a read-only medium such as CD. So, **DVIVIEW** can read a choices file from elsewhere. To enable this feature, simply define the environmental variable **DVIVIEW\$OptionsFile** to contain the filename of the choices file you want to use, before you run **DVIVIEW**.

9 Editing paper sizes

Choosing **Edit paper sizes...** from the icon bar menu opens a dialogue box that allows you to define paper sizes for your documents (see figure 6).

To create a new paper size, enter the name in the icon at the top of the window, set the width and height and click on **Set** or **Save**.

To edit a paper size, either type its name into the icon at the top of the window or choose the size from the pop-up menu, then alter the width and height and click on **Set** or **Save**.

To delete a paper size, enter its name (or use the pop-up menu) and then click on **Delete paper size**. If **Delete paper size** is greyed out it is either because a document is currently using that paper size or else it is the only paper size defined.

The difference between **Set** and **Save** is that **Set** stores the paper size for the current session whereas **Save** stores the paper size (and all the others currently defined) for use in future sessions.

dvi files do not contain page size information and so **DVIVIEW** has to guess the page size and orientation of a document when it loads it. If you define similarly sized paper sizes then **DVIVIEW** may pick the wrong one for your documents. Obviously, you can change a document's paper size but it can be annoying to do so on a regular basis so it's best to only define the paper sizes that you regularly use.

10 Fonts

The \TeX and \LaTeX fonts are automatically installed when the \TeX Fonts application is seen by the Filer. This means that other applications will have these fonts available to them, which is handy if you are exporting pages as Draw files and want them to be displayed properly. Note that the \TeX fonts have letters in different places to standard fonts and so you'll have to use !Chars to select characters if you want to use \TeX fonts in, say, Impression or TechWriter.

If $DVIview$ cannot find RISC OS outlines for a particular font then it will try to substitute the font with another font from the same family (it intelligently adjusts the font so that it looks as much like the font it substitutes as possible). If that fails, $DVIview$ will lookup the font in \TeX Fonts's `RO_Render` files to see if a RISC OS outline font is specified to render the \TeX font. Finally, if that fails, $DVIview$ will use a default font (`cmr10`).

$DVIview$ will use its log window to tell you about font substitutions.

Note that font substitution will only work well with \TeX Fonts version 3.00 or later.

10.1 Virtual fonts

$DVIview$ might support virtual fonts :-) It's supposed to support them but I only have very simple virtual fonts so I can't thoroughly test the facility.

The virtual font system is an ingenious system of font substitution that allows \TeX (and \LaTeX) to typeset non- \TeX fonts. For example, users can typeset the PostScript font Helvetica by using the virtual font `rphvr`. The font has a `tfm` file, so \TeX is happy, and it has a `vf` file that tells the previewer or device driver how to go about typesetting the \TeX characters (this may involve re-mapping characters, combining characters, drawing rules and even combining characters from several different fonts).

Theoretically, virtual font support in $DVIview$ means that you can typeset RISC OS fonts using \TeX and \LaTeX . Unfortunately, you can't actually do this because the appropriate virtual fonts do not exist.

I suspect that the `vf` and `tfm` files could be created automatically from the RISC OS `IntMetrics` files but this would require someone to write the conversion program. I can provide details of the file formats if anyone is interested.

As a stop-gap solution, it may be possible to modify the PostScript virtual fonts for the "standard" RISC OS font families Trinity, Corpus and Homerton. If you want to do this you'll need the `vftovp` and `vptovf` programs, which are supplied in Robin Watts' \TeX distribution; these convert `vf` and `tfm` files into human-readable `vp` files and vice-versa. I can provide details of the `vp` format for anyone who's interested.

You'll note that the PostScript virtual fonts are not of much use as they stand because the glyphs and/or character layouts seem to be different in RISC OS fonts: ligatures and characters with accents do not work (see the example document `Virtual` for a demonstration).

By the way, there's one current limitation of the virtual font implementation: if you create a virtual font that uses $DVIview$'s diagram inclusion command, the diagrams will not be scaled if the virtual font is. It would not be a big hardship to add this functionality but it seemed unlikely that anyone would need it and I have more important features to add.

10.2 Will $DVIview$ support pk fonts?

$DVIview$'s reliance on outline fonts is a pain, mainly because you're limited to

the fonts that are supplied. \TeX previewers on other platforms use bitmapped versions of the \TeX fonts stored in `pk` files. It would be possible to add support for these files to `DVIview`.

The advantages of `pk` file support are that you'd be able to use any \TeX font and the output quality of documents (both on screen and printed) would be better. The disadvantages would be disc space (`pk` files take a lot of space) and speed of loading and scaling new documents (`pk` files need to be created if they don't already exist). In particular, `DVIview` supports arbitrary scaling factors, which could cause large numbers of different-resolution `pk` files to be produced over time. `DVIview` would also support anti-aliased `pk` fonts, which would mean that the `pk` files need to be generated at higher resolutions, which means more disc space :-). Postscript output via `!Printers` would be horrendous (and probably unusable) because it wouldn't be possible to declare `pk` fonts in the Postscript header. Finally, Draw file output would be horrible because characters would have to be represented by sprites: printing or scaling the diagram would give a poor-quality result and the diagram would be extremely large.

Given this list of disadvantages and the effort that implementation would involve, I'm inclined not to bother with `pk` support. However, if there were enough demand I might reconsider.

11 Remarks

A few things are worth noting about version 1.02 of `DVIview`:

- \TeX uses a different font for each font size because fonts should look different at different sizes; they shouldn't just be scaled up. This is why there are so many fonts in the `\TeXFonts` directory. Remember to set a large font cache to speed up screen redraws.
- `DVIview` uses RISC OS outline fonts to draw characters. The advantage of using outlines is that they only take about 20% of the disc space needed to store a full set of `pk` files and they can be plotted at any point size. The disadvantage is that you are limited to the fonts provided (although for most people that won't be a problem). There is (currently) no automated way of generating outline fonts from metafont files.
- When viewing a document, `DVIview` keeps the `dvi` file open. If you need to re-create the `dvi` file then you must first close all the windows displaying that document otherwise \TeX will not be able to write to the `dvi` file. I have some ideas about doing this automatically but the implementation will have to wait for a future release.

12 Version 1.00?

This brief section is intended to satisfy the curiosity of those who are upgrading from version 0.94 (or earlier) and are wondering where versions 0.95-0.99 went.

In the beginning, `DVIview` was rather hacked together. The code it used to load the `dvi` files came from a command-line based program and various parts of `DVIview` had to be designed with this code's limitations in mind. For example, error recovery tended to mean program termination — not an acceptable approach for a Wimp program — and some features were very unfriendly: page offsets needed to be specified before a file was loaded and a 'start page' facility

was the only way to handle large documents. This old `dvi` loading code also had rather unfortunate implications for loading speed and memory requirements.

These problems, combined with limitations of the outline fonts at the time, led me to number the first `DVIview` as version 0.90 i.e. not really up to a version 1.00 :-). The idea was that version 1.00 would be the program that I actually wanted to write and would be proud to release. At the time, I never really expected to reach version 1.00 but here we are.

Version 1.00 of `DVIview` was completely rewritten around new `dvi` loading code that included a virtual memory system. It's the first version of `DVIview` that I'm really proud of.

13 Versions (from 1.00)

- 1.00
 - Complete re-write.
- 1.01
 - Improved printing facilities:
 - Infamous "Out of memory" error when printing bug removed.
 - Range selection is now by page number rather than sheet number.
 - Double-sided printing now supported.
 - Improved layout when printing landscape documents on upright paper (or vice-versa).
 - Support for 'deep' sprites added (RISC OS 3.5+ only).
 - Support for JPEGs added (RISC OS 3.6+ only).
 - Page number now appears in the page display's title bar.
 - New error system should catch all errors (including Address Exceptions and the like). Of course, whether it successfully recovers from those errors is another matter :-).
 - Error messages are more detailed.
 - Errors in `special` commands (e.g. for including diagrams) no longer stop you from viewing the page.
 - Added keyboard shortcuts for moving to the start and end of the document (`^↑`, `Home`, `^↓`).
 - Now only responds to files dragged to the icon bar icon. Previously, dragging a file to any `DVIview` window worked.
- 1.02
 - Added the Magnifier.
 - Missing fonts are now substituted by a different-sized font of the same family (or a default font if no fonts in the family are available).
 - Added support for specifying the RISC OS font to use when rendering a `TEX` font.
 - Virtual fonts are now supported.
 - JPEGs can now be used on releases of RISC OS earlier than 3.6 as long as the `SpriteExtend` module v0.99 or later is available.
 - Warnings and non-serious errors are now directed to a log window.
 - When changing page, the window scroll bars are now adjusted to display the top left of the page contents except that if part of the top or left margin can be seen, the corresponding scroll bar is not adjusted (this is easier to use than explain :-)).

14 Copying and altering the program

You may freely distribute `DVIview` provided that:

1. No charge is made for it.
2. It is not distributed as a ‘freebie’ with commercial software.
3. No changes are made to it (i.e. no files are added, deleted or modified).

You may modify the application (e.g. save your own `Choices` file in the `DVIview` directory), provided that you do not distribute the modified application.

15 Registering

In earlier releases, I asked users with email addresses to register. There are a lot of people using `DVIview` now and using the register for announcements was become a burden so you don’t have to register any more. You can still email me and say “hi” if you like.

I will make announcements of new versions on the `comp.sys.acorn.announce` newsgroup but please feel free to email or write to me if you want to know the latest version or if you have complaints, praise, features you want added or whatever.

16 Contacting the author

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Finally, thanks to everyone who has contacted me with ideas, praise and bug reports for past versions of `DVIview`. Without their support, I would probably not have bothered to develop `DVIview` to the extent I have (I very rarely use `TEX` or `LATEX` myself).