1. **conveps.** Convert Encapsulated PostScript to structured PostScript and PNG (conveps.web).

   [LDF 2006.04.22] This program now works. It could be refined, though.

   (Version control identifier 1) ≡

   static char rev_id[] = "$Id: conveps.web,v1.55u2006/01/25u15:54:06,ulfinstol1,Exp1$";

   This code is used in section 78.

2. **Copyright and License.**


   See the section (GNU Free Documentation License 75) for the copying conditions that apply to this document.

   conveps is part of GNU 3DLDF.

   **The program** GNU 3DLDF documented here is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version. See the section (GNU General Public License 76) in this document.

   GNU 3DLDF is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

   You should have received a copy of the GNU General Public License along with 3DLDF; if not, write to the Free Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA.

   GNU 3DLDF is a GNU package. It is part of the GNU Project of the Free Software Foundation and is published under the GNU General Public License. See the website http://www.gnu.org for more information. GNU 3DLDF is available for downloading from http://www.gnu.org/software/3dladf/LDF.html. It is also available from http://www.dante.de/software/ctan/, the Dante www.server and from http://wwwuser.gwdg.de/~lfinstol, the author’s website.

   Please send bug reports to:
   lfinstol@gwdg.de

   The mailing list help-3DLDF@gnu.org is available for people to ask other users for help. The mailing list info-3DLDF@gnu.org is for sending announcements to users. To subscribe to these mailing lists, send an email with “subscribe (email-address)” as the subject.

   The author can be contacted at:
   Laurence D. Finston
   Kreuzbergiring 41
   D-37075 Goettingen
   Germany
   lfinstol@gwdg.de
   s246794@stud.uni-goettingen.de

   Web site: http://wwwuser.gwdg.de/~lfinstol

3. **Instructions for use.** [LDF 2005.05.02]
conveys takes one required argument, the filename without extension of the Encapsulated PostScript (EPS) files. This argument can be followed by one or two numbers indicating the first and last EPS files that should be processed. The defaults for the first and last files are 0 and 100, respectively. If these arguments aren’t used, and \texttt{(filename).0} doesn’t exist, conveys tries to process \texttt{(filename).0}. If a file fails to exist for a larger number, conveys will exit.

Given the files \texttt{3DLDFmp.1}, \texttt{3DLDFmp.2}, and \texttt{3DLDFmp.3}, “conveys \texttt{3DLDFmp 1 3}” will generate the files \texttt{3DLDFmp_1.pnm}, \texttt{3DLDFmp_2.pnm}, and \texttt{3DLDFmp_3.pnm}.

conveys can be invoked using the options in the following list. Options can take no argument, a required argument, or an optional argument. Optional arguments must be passed as follows: \texttt{--\{option\} \{argument\}}. Required arguments can be passed like this, but in this case, a space can be substituted for the equals sign.

Color arguments must be specified as required by the ImageMagick programs. See the ImageMagick manual (“\texttt{man pages}”) for more information. Color arguments containing parentheses should be quoted, to prevent the shell from treating them as special characters.

\begin{itemize}
\item \texttt{--\{option\}} Optional numerical argument. If \texttt{n} is the argument, a border of \texttt{n} pixels is added to the image. If no argument is used, the default value of 10 is used.
\item \texttt{--\{option\}} Required color argument. Used together with the \texttt{--\{option\}}, \texttt{--\{option\}}, or \texttt{--\{option\}} options. If not used, the border will be white.
\item \texttt{--\{option\}} Optional argument. If no argument is used, the image is coerced to 640 \times 480 pixels. If the argument “a” (for “small”) is used, it is coerced to 320 \times 240 pixels. If any other argument is used, conveys issues a warning and coerces the image to 640 \times 480 pixels.
\item \texttt{--\{option\}} Required numerical argument. The number of the last file EPS to be processed.
\item \texttt{--\{option\}} Required color argument. This option is used in combination with the \texttt{--\{option\}} argument. When replacing colors in an image, the \texttt{--\{option\}} color replaces the \texttt{--\{option\}} color.
\item \texttt{--\{option\}} No argument. If no \texttt{--\{option\}} argument is used, \texttt{--\{option\}} will cause conveys to continue trying to find files to convert until it reaches the default value (currently 100).
\item \texttt{--\{option\}} No argument. Grayscale pixel values are negated. See also the \texttt{--\{option\}} option.
\item \texttt{--\{option\}} Required numerical argument. Currently not used for anything.
\item \texttt{--\{option\}} No argument. Prints information about conveys to standard output and exits.
\item \texttt{--\{option\}} Optional numerical argument. If \texttt{n} is the argument, a border of \texttt{n} pixels is added to the left and right sides of the image. If no argument is used, the default value of 10 is used.
\item \texttt{--\{option\}} The \LaTeX{} files that include the images will be in DIN A3 landscape format, i.e., width 420mm and height 297mm.
\end{itemize}
§3 conveps

--large
The \TeX{} files that include the images will be in DIN A3 format, i.e., width 420mm and height 297mm.

--new-filename
Required string argument. The files created by conveps will have names beginning with this string. It will be followed by an underline character and a number, possibly preceded by one or more zeroes. The extension will indicate the file format.

--no-zeroes
No argument. Suppresses the use of leading zeroes in the output filenames.

--opaque
Required argument. This option is used in combination with the --fill argument. When replacing colors in an image, the --fill color replaces the --opaque color.

--negate
No argument. Pixel values are negated. See also the --gray-negate option.

--output-format
Required string argument. The argument can be “eps”, “jpeg”, “jpg”, “png”, “pnm”, or “ps”. Case is ignored, so “JPG” or “jPg” is equivalent to “jpg”. PNM is the default output format.

--portrait
The \TeX{} files that include the images will be in DIN A3 portrait format, i.e., width 297mm and height 420mm.

--quiet
No argument. Suppresses some terminal output.

--renumber
Required argument. The output files will be numbered starting with the argument.

--silent
No argument. Suppresses more terminal output than the “--quiet” option.

--start
Required argument. The starting number for the input files.

--threads-limit
Required argument. The greatest number of threads created by conveps that can be active at one time. The default is 100.

--transparent
Required color argument. This color will be made transparent in the output files, provided their format supports transparency.

--verbose
No argument. Enables more terminal output than normal.

--version
No argument. Prints out the version number of conveps and exits.

--vertical-border
Optional numerical argument. If $n$ is the argument, a border of $n$ pixels is added to the top and bottom of the image. If no argument is used, the default value of 10 is used.

--width
Required numerical argument. Currently not used for anything.

--zeroes
Required argument. Specifies the minimum number of leading zeroes used in the numbers included in the names of the output files.

4. Generating the executable conveps. [LDF 2005.04.26.]
To generate the executable `conveys`, call `make convey` from a shell. Alternatively, you can call `ctangle convey.web` and `gcc -o convey -g -pthread convey.o`.

5. **Invoking convey**. [LDF 2006.08.24.]
6. Include files. [LDF 2005.04.21.]
   (Include files 6) \equiv
   #include "config.h"
   #include <ctype.h>
   #include <getopt.h>
   #include <iomanip>
   #include <ios>
   #include <iostream>
   #include <limits.h>
   #include <math.h>
   #include <new>
   #include <pthread.h>
   #include <sstream>
   #include <stdio.h>
   #include <stdlib.h>
   #include <string.h>
   #include <time.h>
   #include <unistd.h>

   using namespace std;

   This code is used in section 78.

7. Preprocessor macros. [LDF 2005.08.18.]

   \[\text{Log} \quad \text{LDF 2005.08.18.} \quad \text{Added this section.}\]

   (Preprocessor macros 7) \equiv
   #define DEBUG_COMPILE 1

   This code is used in section 78.

8. Type declarations. [LDF 2005.04.21.]

   (Type declarations 8) \equiv
   
   typedef char Byte;
   typedef Byte Signed_Byte;
   typedef unsigned char Unsigned_Byte;

   This code is used in section 78.

9. Declare Thread_Func_Arg_Type. [LDF 2005.08.26.]

   \[\text{Log} \quad \text{LDF 2005.08.26.} \quad \text{Added this section.}\]

   (Declare Thread_Func_Arg_Type 9) \equiv
   struct Thread_Func_Arg_Type {
     int eps_file_number;
     int threadNr;
     char zeroes_string[MAX_ZEROES_STRING];
   };

   This code is used in section 78.
Global constants. [LDF 2006.04.21.]

[LDF 2006.09.02.] Added const unsigned short DEFAULT_END_VALUE = 100.

(void)

10. DECLARE THREAD_FUNC_ARG_TYPE

Log

const Unsigned_Bit MAX_FILENAME = 32; /* 2^5 */
const unsigned short MAX_SYSTEM_STRING = 1024; /* 2^10 */
const unsigned short MAX_TEX_FILE_HEADER = 1024;
const unsigned short MAX_DATESTAMP = 128; /* 2^7 */
const unsigned short MAX_BORDER_STRING = 128;
const unsigned short DEFAULT_BORDER_VALUE = 10;
const unsigned short DEFAULT_END_VALUE = 100;
const unsigned short MAX_COLOR_STRING = 128;
const unsigned short MAX_ZEROS_STRING = 16;
const unsigned short DEFAULT_ZEROS = 2;
const unsigned short MAX_COERC_STRING = 32;
const unsigned short MAX_OUTPUT_EXTENSION = 8;
const unsigned short DEFAULT_THREADS_LIMIT = 100;
const Unsigned_Bit SILENT = 0;
const Unsigned_Bit QUIET = 1;
const Unsigned_Bit NORMAL = 2;
const Unsigned_Bit VERBOSE = 3;
const Unsigned_Bit PORTRAIT = 0;
const Unsigned_Bit LANDSCAPE = 1;

This code is used in section 78.
11. Global variables. [LDF 2005.08.18.]

\[
\begin{align*}
\text{Log} & \quad \text{Added bool } \text{force\_switch} = false. \\
\text{Log} & \quad \text{Added } \text{Unsigned\_Byte } \ast \text{default\_output}.
\end{align*}
\]

\[
\text{(Global variables 11 \equiv)}
\begin{align*}
\text{Unsigned\_Byte} & \ \text{VERBOSITY}; \\
\text{char} & \ \text{filename\_stem}[\text{MAX\_FILENAME}]; \\
\text{char} & \ \text{new\_filename\_stem}[\text{MAX\_FILENAME}]; \\
\text{int} & \ \text{start\_value} = -1; \\
\text{int} & \ \text{end\_value} = -1; \\
\text{char} & \ \text{border\_string}[\text{MAX\_BORDER\_STRING}]; \\
\text{char} & \ \text{vertical\_border\_string}[\text{MAX\_BORDER\_STRING}]; \\
\text{char} & \ \text{horizontal\_border\_string}[\text{MAX\_BORDER\_STRING}]; \\
\text{char} & \ \text{default\_border\_string}[\text{MAX\_BORDER\_STRING}]; \\
\text{char} & \ \text{border\_color\_string}[\text{MAX\_COLOR\_STRING}]; \\
\text{char} & \ \text{default\_border\_color\_string}[\text{MAX\_COLOR\_STRING}]; \\
\text{Unsigned\_Byte} & \ \text{eps\_output} = 0; \\
\text{Unsigned\_Byte} & \ \text{jpeg\_output} = 0; \\
\text{Unsigned\_Byte} & \ \text{pnm\_output} = 0; \\
\text{Unsigned\_Byte} & \ \text{png\_output} = 0; \\
\text{Unsigned\_Byte} & \ \ast \text{default\_output} = 0; \\
\text{bool} & \ \text{force\_switch} = false; \\
\text{char} & \ \text{fill\_string}[\text{MAX\_COLOR\_STRING}]; \\
\text{char} & \ \text{opaque\_string}[\text{MAX\_COLOR\_STRING}]; \\
\text{char} & \ \text{transparent\_string}[\text{MAX\_COLOR\_STRING}]; \\
\text{char} & \ \text{negative\_string}[16] = "\"; \\
\text{signed int} & \ \text{zeroes} = -1; \\
\text{unsigned int} & \ \text{height\_value} = 0; \\
\text{unsigned int} & \ \text{width\_value} = 0; \\
\text{unsigned int} & \ \text{renumber\_value} = 0; \\
\text{Unsigned\_Byte} & \ \text{coerce\_value} = 0; \\
\text{Unsigned\_Byte} & \ \text{portrait\_landscape} = \text{LANDSCAPE}; \\
\text{char} & \ \text{coerce\_string}[\text{MAX\_COERC\_STRING}]; \\
\text{char} & \ \text{output\_extension}[\text{MAX\_OUTPUT\_EXTENSION}]; \\
\text{pthread\_t} & \ \ast \text{thread\_array}[\text{PTHREAD\_THRE\_MAX}]; \\
\text{Thread\_Func\_Arg\_Type} & \ \ast \text{thread\_func\_array}[\text{PTHREAD\_THRE\_MAX}]; \\
\text{pthread\_mutex\_t} & \ \ast \text{stdlib\_mutex}; \\
\text{unsigned short} & \ \text{threads\_limit} = \text{DEFAULT\_THRE\_LIM\_MAX}; \\
\text{char} & \ \text{tex\_file\_header}[\text{MAX\_TEX\_FILE\_HEADER}]; \\
\text{This code is used in section 78.}
\end{align*}
\]

12. Local variables for main(). [LDF 2005.08.18.]

\[
\begin{align*}
\text{Log} & \quad \text{Added this section.}
\end{align*}
\]

\[
\text{(Local variables for main() \equiv)}
\begin{align*}
\text{bool} & \ \text{DEBG} = false; \quad /* \text{true} */
\end{align*}
\]
int status;
char zeroes_string[MAX_ZEROS_STRING];
This code is used in section 50.

13. Command line options. [LDF 2005.08.18]

[LDF 2005.08.18.] Added this section.

14. Declarations for command line options. [LDF 2005.08.18]

[LDF 2005.08.18.] Added this section.

{Declarations for command line options 14} ≡

int option_str;
int digitOptInd = 0;
const unsigned short BORDER_INDEX = 0;
const unsigned short BORDER_COLOR_INDEX = 1;
const unsigned short COERCED_INDEX = 2;
const unsigned short END_INDEX = 3;
const unsigned short FILL_INDEX = 4;
const unsigned short FORCE_INDEX = 5;
const unsigned short GRAY_NEGATE_INDEX = 6;
const unsigned short HEIGHT_INDEX = 7;
const unsigned short HELP_INDEX = 8;
const unsigned short HORIZONTAL_BORDER_INDEX = 9;
const unsigned short LANDSCAPE_INDEX = 10;
const unsigned short NEGATE_INDEX = 11;
const unsigned short NEW_FILENAME_INDEX = 12;
const unsigned short NO_ZEROS_INDEX = 13;
const unsigned short OPAQUE_INDEX = 14;
const unsigned short OUTPUT_FORMAT_INDEX = 15;
const unsigned short PORTRAIT_INDEX = 16;
const unsigned short QUIET_INDEX = 17;
const unsigned short RENUMBER_INDEX = 18;
const unsigned short SILENT_INDEX = 19;
const unsigned short START_INDEX = 20;
const unsigned short THREADS_LIMIT_INDEX = 21;
const unsigned short TRANSPARENT_INDEX = 22;
const unsigned short VERBOSITY_INDEX = 23;
const unsigned short VERSION_INDEX = 24;
const unsigned short VERTICAL_BORDER_INDEX = 25;
const unsigned short WIDTH_INDEX = 26;
const unsigned short ZEROS_INDEX = 27;

static struct option long_options[] = {{"border",2,0,0},{"bordercolor",1,0,0},{"coerce",2,0,0},
{"end",1,0,0},{"fill",1,0,0},{"force",0,0,0},{"gray-negate",0,0,0},{"height",1,0,0},
{"help",0,0,0},{"horizontal-border",2,0,0},{"landscape",0,0,0},{"negate",0,0,0},
{"new-filename",1,0,0},{"no-zeroes",0,0,0},{"opaque",1,0,0},{"output-format",1,0,0},
{"portrait",0,0,0},{"quiet",0,0,0},{"renumber",1,0,0},{"silent",0,0,0},{"start",1,0,0},
{"width",0,0,0},{"version",1,0,0},"-h",0,0,0},"-v",0,0,0},
{"help",0,0,0},"-n",0,0,0},"--version",0,0,0},
{"version",0,0,0}};

"usage:"
"  main [options] ARGUMENTS";
"options:
  -h, --help            show this help message and exit
  -v, --version         output version information and exit
  --version=n           output version information then exit
  -V, --very-version=n  output very version information then exit
  --help=n              output help message then exit
  --version=n --help=n   output version information then help message then exit
  --version=n --help=n --very-version=n output version information then help message then version
  --version=n --help=n --very-version=n --help=n output version information then help message then version
§14  convens

{"threads-limit", 1, 0, 0}, {"transparent", 1, 0, 0}, {"verbose", 0, 0, 0}, {"version", 0, 0, 0},
{"vertical-border", 2, 0, 0}, {"width", 1, 0, 0}, {"zeros", 1, 0, 0}, {0, 0, 0, 0});
int option_index = 0;
int this_option_optind = optind ? optind : 1;

This code is used in section 50.

15. Process command line options.  [LDF 2006.08.18]

[LDF 2006.08.18.] Added this section.

(Process command line options 15)  ≡

DEBUG = false;  /* true */

; while (1) { option_ctr = getopt_long_only(argc, argv, "cefglnopqrstvwz", long_options, &option_index);
if (option ctr ≡ -1) {
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≡ "No more option arguments. " ≡ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
  break;
}
if (option ctr ≡ 0) {
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≡ "option_name" ≡ long_options[option_index].name;
    if (optarg) cerr ≡ "with_arg=optarg" ≡ optarg ≡ endl;
    else cerr ≡ "with_no_arguments" ≡ endl;
    cerr ≡ "option_index=option_index" ≡ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
}

See also sections 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, and 47.

This code is used in section 51.
16. **Border.** [LDF 2005.08.24.] 

[LDF 2005.08.24.] Added this section.

```c
{Process command line options 15} +
  if (option_index == BORDER_INDEX) {
      if (optarg) strpy(border_string, optarg);
      else sprintf(border_string, "\%d", DEFAULT_BORDER_VALUE);
  } #if DEBUG_COMPILE
  if (DEBUG) {
      pthread_mutex_lock(&stdio_mutex);
      fprintf(stderr, "Setting border_string to \%s.\n", border_string);
      pthread_mutex_unlock(&stdio_mutex);
  } #endif /* DEBUG_COMPILE */
} /* if (option_index == BORDER_INDEX) */

17. **Bordercolor.** [LDF 2005.08.24.] 

[LDF 2005.08.24.] Added this section.

```c
{Process command line options 15} +
  else if (option_index == BORDER_COLOR_INDEX) { sprintf(border_color_string, \%s\", optarg);
  } #if DEBUG_COMPILE
  if (DEBUG) {
      pthread_mutex_lock(&stdio_mutex);
      fprintf(stderr, "Setting border_color_string to \%s.\n", border_color_string);
      pthread_mutex_unlock(&stdio_mutex);
  } #endif /* DEBUG_COMPILE */
} /* if (option_index == BORDER_COLOR_INDEX) */
§18  conveys

18. coerce. [LDF 2005.08.18.]

[LDF 2005.08.18.] Added this section.

(Process command line options 15) \[
\] else if (option_index \equiv \text{COERCER_INDEX}) {

```c
#define DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Coercing\n");
    if (optary) fprintf(stderr, "optarg\0\n", optary);
    else fprintf(stderr, "argc=0\n");
    pthread_mutex_unlock(&stdio_mutex);
}
#endif /* DEBUG_COMPILE */
if (optary && strcmp[optary,"n"]) {
    #if DEBUG_COMPILE
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Coercing to 320x240 pixels\n");
    pthread_mutex_unlock(&stdio_mutex);
    #endif /* DEBUG_COMPILE */
    coerce_value = 1; } else if (optary && strcmp[optary,"n"]1") {
    #if DEBUG_COMPILE
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Coercing to 640x480 pixels\n");
    pthread_mutex_unlock(&stdio_mutex);
    #endif /* DEBUG_COMPILE */
    coerce_value = 2; } else
if (optary) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "WARNING! invalid argument for\" coerces\" option: \0\n"
    ill_coercer_to_640x480_pixels.\0\n", optarg);
    pthread_mutex_unlock(&stdio_mutex);
    coerce_value = 2;
    }
else {
    #if DEBUG_COMPILE
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << "optarg\0\n"
        << "Coercing to 640x480 pixels" << endl;
        pthread_mutex_unlock(&stdio_mutex);
    }
#endif /* DEBUG_COMPILE */
    coerce_value = 2; } } /* if (option_index \equiv \text{COERCER_INDEX}) */
```
19. end. [LDF 2006.08.19.]

Log

[LDF 2006.08.19.] Added this section.
[LDF 2006.09.02.] Now setting force_switch = true.

20. fill. [LDF 2005.08.22.]

Log

[LDF 2005.08.22.] Added this section.

21. force. [LDF 2005.09.02.]

Log

[LDF 2005.09.02.] Added this section.
22. gray-negate. [LDF 2005.09.01.]

[LDF 2005.09.01.] Added this section.

```c
{Process command line options 15} +≡
else if (option_index ≡ GRAY_NEGATE_INDEX) { strcpy(negate_string,"+negate");
#endif /* DEBUG_COMPILE */
} /* if (option_index ≡ GRAY_NEGATE_INDEX) */
```

23. height. [LDF 2005.08.18.]

[LDF 2005.08.18.] Added this section.

```c
{Process command line options 15} +≡
else if (option_index ≡ HEIGHT_INDEX) { sscanf(optarg,"%d",height_value);
#endif /* DEBUG_COMPILE */
} /* if (option_index ≡ HEIGHT_INDEX) */
```

24. help.

(Process command line options 15) +≡
else
if (option_index ≡ HELP_INDEX) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"conveys\nCopyright(C)\n2005\nThe\nFree\nSoftware\nFoundation\n\n");
    pthread_mutex_unlock(&stdio_mutex);
    exit(0);
} /* if (option_index ≡ HELP_INDEX) */
25. Horizontal Border.  [LDF 2005.08.19.]

[LDF 2006.08.19.] Added this section.

(Process command line options 15) +≡
else if (option_index ≡ HORIZONTAL_BORDER_INDEX) {
  if (optary) strcpy(horizontal_border_string, optary);
  else sprintf(horizontal_border_string, "%d", DEFAULT_BORDER_VALUE);
#else DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"Setting\horizontal\border\string\_\to\_\\%s\.
&&\n    pthread_mutex_unlock(&stdio_mutex);
  }
#endif /* DEBUG_COMPILE */
} /* if (option_index ≡ HORIZONTAL_BORDER_INDEX) */

26. landscape.  [LDF 2005.09.01.]

[LDF 2005.09.01.] Added this section.

(Process command line options 15) +≡
else
  if (option_index ≡ LANDSCAPE_INDEX) {
    portrait=landscape = LANDSCAPE;
  } /* if (option_index ≡ LANDSCAPE_INDEX) */

27. negate.  [LDF 2005.09.01.]

[LDF 2005.09.01.] Added this section.

(Process command line options 15) +≡
else if (option_index ≡ NEGATE_INDEX) { strcpy(negate_string,"-negate");
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"Setting\negate\string\_\to\_\\%s\.
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif /* DEBUG_COMPILE */
} /* if (option_index ≡ NEGATE_INDEX) */
28. new-filename. [LDF 2005.08.26.]

[LDF 2005.08.26.] Added this section.

```c
{Process command line options 15} +≡
  else if (option_index ≡ NEW_FILENAME_INDEX) { sscanf (optarg, "%s", &new_filename_stem);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock (&stdio_mutex);
    printf (stderr, "Setting new_filename_stem to '%s'.\n", new_filename_stem);
    pthread_mutex_unlock (&stdio_mutex);
  }
#endif /* DEBUG_COMPILE */
} /* if (option_index ≡ NEW_FILENAME_INDEX) */
```

29. no-zeroes. [LDF 2005.08.22.]

[LDF 2005.08.22.] Added this section.

```c
{Process command line options 15} +≡
  else if (option_index ≡ NO_ZEROES_INDEX) { zeroes = 0;
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock (&stdio_mutex);
    printf (stderr, "Setting zeroes to %d.\n", zeroes);
    pthread_mutex_unlock (&stdio_mutex);
  }
#endif /* DEBUG_COMPILE */
} /* if (option_index ≡ NO_ZEROES_INDEX) */
```

30. opaque. [LDF 2005.08.22.]

[LDF 2005.08.22.] Added this section.

```c
{Process command line options 15} +≡
  else if (option_index ≡ OPAQUE_INDEX) { sprintf (opaque_string, "-opaque\"%s\"", optarg);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock (&stdio_mutex);
    printf (stderr, "Setting opaque_string to '%s'.\n", opaque_string);
    pthread_mutex_unlock (&stdio_mutex);
  }
#endif /* DEBUG_COMPILE */
} /* if (option_index ≡ OPAQUE_INDEX) */
```
31. output. [LDF 2006.08.19.]

Log

[LDF 2006.08.19.] Added this section.

[LDF 2006.12.17.] BUG FIX: Now setting *default_output %= 2 in the case that optary is "pnm".

(Process command line options 15) +≡

else

if (option_index ≡ OUTPUT_FORMAT_INDEX) {

if (!strcasecmp(optary, "eps")) {
    eps_output = 1;
    *default_output %= 2;
} else if (!strcasecmp(optary, "jpeg") || !strcasecmp(optary, "jpg")) {
    jpeg_output = 1;
    *default_output %= 2;
} else if (!strcasecmp(optary, "png")) {
    png_output = 1;
    *default_output %= 2;
} else if (!strcasecmp(optary, "pnm")) {
    pnm_output = 1;
    *default_output %= 2;
} else if (!strcasecmp(optary, "ps")) {
    ps_output = 1;
    *default_output %= 2;
} else {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "WARNING! Unknown '-output-format' argument: %s\nIgnoring.\n", optary);
    pthread_mutex_unlock(&stdio_mutex);
} /* if (option_index ≡ OUTPUT_FORMAT_INDEX) */

32. portrait. [LDF 2005.09.01.]

Log

[LDF 2005.09.01.] Added this section.

(Process command line options 15) +≡

else

if (option_index ≡ PORTRAIT_INDEX) {
    portrait_or_landscape = PORTRAIT;
} /* if (option_index ≡ PORTRAIT_INDEX) */
§33. quiet.

(Process command line options 15) +≡
else if (option_index ≡ QUIT_INDEX) {
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr,"Will run quietly.\n");
        pthread_mutex_unlock(&stdio_mutex);
    }
    /* DEBUG_COMPILE */
    VERBOSITY = QUIT;
}

34. renumber. [LDF 2005.08.26]

[Log]

(Process command line options 15) +≡
else if (option_index ≡ RENUMBER_INDEX) { sscanf(optarg,"%d",&renumber_value);
    —renumber_value;
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr,"Renumbering, starting with,%d.\n",renumber_value);
        pthread_mutex_unlock(&stdio_mutex);
    }
    /* DEBUG_COMPILE */
} /* if (option_index ≡ RENUMBER_INDEX) */

35. silent.

(Process command line options 15) +≡
else if (option_index ≡ SILENT_INDEX) {
    if (DEBUG) {
        if (DEBUG) {
            pthread_mutex_lock(&stdio_mutex);
            fprintf(stderr,"Will run silently.\n");
            pthread_mutex_unlock(&stdio_mutex);
        }
    }
    /* DEBUG_COMPILE */
    VERBOSITY = SILENT;
}
36. start. [LDF 2005.08.19.]

[LDF 2005.08.19.] Added this section.

```c
(Process command line options 15) +=
else if (option_index == START_INDEX) {
  sscanf(optarg, "%d", &start_value);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    printf(stderr, "Setting start_value to %d.\n", start_value);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif  /* DEBUG_COMPILE */
} /* else if (option_index == START_INDEX) */
```

37. Threads Limit. [LDF 2005.08.27.]

[LDF 2005.08.27.] Added this section.

```c
(Process command line options 15) +=
else if (option_index == THREADS_LIMIT_INDEX) {
  sscanf(optarg, "%d", &threads_limit);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    printf(stderr, "Setting threads_limit to %d.\n", threads_limit);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif  /* DEBUG_COMPILE */
} /* else if (option_index == THREADS_LIMIT_INDEX) */
```

38. transparent. [LDF 2005.08.22.]

[LDF 2005.08.22.] Added this section.

```c
(Process command line options 15) +=
else if (option_index == TRANSPARENT_INDEX) {
  sprintf(transparent_string, "-transparent,\"%s\"", optarg);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    printf(stderr, "Setting transparent_string to\%s.\n", transparent_string);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif  /* DEBUG_COMPILE */
} /* else if (option_index == TRANSPARENT_INDEX) */
```
39. verbose.

```c
(if (option_index == VERBOSE_INDEX) +
else if (option_index == VERBOSE_INDEX) {
    #if DEBUG_COMPILE
    if (DEBUG) {
        if (DEBUG) {
            pthread_mutex_lock(&stdio_mutex);
            fprintf(stderr, "Will run,verbosely,\n");
            pthread_mutex_unlock(&stdio_mutex);
        }
    }
    #endif  /* DEBUG_COMPILE */
    VERBOSITY = VERBOSE; }
40. version.

(if (option_index == VERSION_INDEX) +
else {
    if (option_index == VERSION_INDEX) {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr, "conveys 1.2.0.0\n");
        pthread_mutex_unlock(&stdio_mutex);
        exit(0);
    }
41. Vertical Border. [LDF 2005.08.18]
[Log]
[LDF 2005.08.19] Added this section.
```
42. width. [LDF 2005.08.18.]

LDF 2005.08.18. Added this section.

```c
{Process command line options 15} +
else if (option_index == WIDTH_INDEX) { sscanf(optarg, "%d", &width_value);
#if DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"Setting %d_width to %d_pixels.

width_value);
    pthread_mutex_unlock(&stdio_mutex);
}
#endif /* DEBUG_COMPILE */
} /* if (option_index == WIDTH_INDEX) */
```

43. zeroes. [LDF 2005.08.22.]

LDF 2005.08.22. Added this section.

```c
{Process command line options 15} +
else if (option_index == ZERGES_INDEX) { sscanf(optarg, "%d", &zeroes);
#if DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"Setting %d_zeroes to %d.

zeroes);
    pthread_mutex_unlock(&stdio_mutex);
}
#endif /* DEBUG_COMPILE */
} /* if (option_index == ZERGES_INDEX) */
```

44. Invalid option_index value.

```c
{Process command line options 15} +
else {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"ERROR! %s in main():%n'

option_index' has invalid value: %d\n
will try to continue.

option_index);
    pthread_mutex_unlock(&stdio_mutex);
}
} /* if (option_cotr == 0) */
```

45. Ambiguous option.

```c
{Process command line options 15} +
else
    if (option_cotr == 'p') {
        pthread_mutex_lock(&stdio_mutex);
        ccr = "ERROR! %s in main(): %s getopt_long() returned %d, " %

"ambiguous match breaking."
crdr;
        pthread_mutex_unlock(&stdio_mutex);
    }
```
46. **Invalid option.**

(Process command line options 15) +
else {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "getopt_long() returned invalid_option.
    pthread_mutex_unlock(&stdio_mutex);
}
47. End of while loop.

```c
(Process command line options 15) +
) } / * while */
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"In\nmain()\nEnd of command
line processing.\n\n");
    pthread_mutex_unlock(&stdio_mutex);
}
```

48. Process filenames.  [LDF 2005.08.18]

```c
(Process filenames 48) \equiv

Unsigned_BYTE arg\_ctr \equiv optind;

#if DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"arg\_ctr\equiv\%d\nargc\equiv\%d\n\n", arg\_ctr, argc);
    pthread_mutex_unlock(&stdio_mutex);
}
#endif / * DEBUG_COMPILE */
if (argc \equiv arg\_ctr < 1) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"ERROR! In\nmain()\nNot enough arguments.\nExiting, \nConv\n\nwith return value \n1.\n
");
    pthread_mutex_unlock(&stdio_mutex);
    return 1;
} / * if */
if (argc \equiv arg\_ctr \geq 1) strcpy(filename\_stem, argv[arg\_ctr]);

#if DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"filename\_stem\equiv\%s\n\n", filename\_stem);
    pthread_mutex_unlock(&stdio_mutex);
}
#endif / * DEBUG_COMPILE */
++ arg\_ctr;

#if DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"Before start value arg\_ctr\equiv\%d\n\n", arg\_ctr);
    fprintf(stderr,"Before start value arg\_start_value\equiv\%d\n\n", start_value);
    pthread_mutex_unlock(&stdio_mutex);
}
#endif / * DEBUG_COMPILE */
if (argc \equiv arg\_ctr \geq 1 \&\& start_value \neq -1) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"WARNING! start_value already set using an optional argument\n\nent.\n\n\nstart_value\equiv\%d\nNot resetting to\%s\n\n", start_value, argv[arg\_ctr]);
```
§48

```c
pthread_mutex_unlock(&stdio_mutex);
}
else if (argc - arg ctr ≥ 1 ∧ start_value ≡ −1) sscanf(argv[argc ctr], "%d", &start_value);
else if (start_value ≡ −1) start_value = 0;
#else if DEBUG_COMPILE
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr, "After start value arg:arg ctr==\d\n", argv
        fprintf(stderr, "After start value arg:arg start value==\d\n", start_value);
        pthread_mutex_unlock(&stdio_mutex);
    }
#endif /* DEBUG_COMPILE */
++ arg ctr;
#else if DEBUG_COMPILE
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr, "Before end value arg:arg ctr==\d\n", argv
        fprintf(stderr, "Before end value arg:arg end value==\d\n", end_value);
        pthread_mutex_unlock(&stdio_mutex);
    }
#endif /* DEBUG_COMPILE */
if (argc - arg ctr ≥ 1 ∧ end_value ≠ −1) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "WARNING: end_value already set using an optional argument
    t.\n    end_value==\d.\n    Not resetting to\%s\n", end_value, argv[argc ctr]);
    pthread_mutex_unlock(&stdio_mutex);
}
```

See also section 49.

This code is used in section 54.
[LDF 2006.09.02] Now setting force_switch = true.

***************
(Process filenames 48) +
else
  if (aryc - arg_ctr >= 1 && end_value == -1) {
    scanf(aryv[argv_argc],"%d",end_value);
    force_switch = true;
  }
else if (end_value == -1) end_value = DEFAULT_END_VALUE;
#endif /* DEBUG_COMPILE */
++arg_ctr;

50. Main, [LDF 2006.04.21.]
(Main 50) 
int main(int argc, char **argv){ VERBOSITY = NORMAL;
  (Local variables for main() 12)
  pthread_mutex_init(&stdio_mutex,0);
  strcpy(border_string,"\n");
  strcpy(horizontal_border_string,"\n");
  strcpy(vertical_border_string,"\n");
  sprintf(default_border_string,"%d",DEFAULT_BORDER_VALUE);
  strcpy(border_color_string,"\n");
  strcpy(default_border_color_string,"white");
  strcpy(fill_string,"\n");
  strcpy(transparent_string,"\n");
  strcpy(new_filename Stem,"\n");
See also sections 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, and 62.
This code is used in section 78.
51.

Log

[LDF 2006.12.16.] Added this section. Now setting Unsigned_Byte *default_output according to the value of the environment variable "CONVEPS_DEFAULT_OUTPUT_FORMAT", if present and valid. Otherwise, it’s set to point to Unsigned_Byte png_output.

[LDF 2006.12.17.] BUG FIX: Fixed the way I use the return value of getenv().

(Main 50) +≡

```c
char *default_output_env_var = getenv("CONVEPS_DEFAULT_OUTPUT_FORMAT");
if (~default_output_env_var || strlen(default_output_env_var) < 0) default_output = &png_output;
else if (~strncasecmp(default_output_env_var, "eps", 10)) default_output = &eps_output;
else if (~strncasecmp(default_output_env_var, "jpeg", 10)) default_output = &jpeg_output;
else if (~strncasecmp(default_output_env_var, "jpg", 10)) default_output = &jpeg_output;
else if (~strncasecmp(default_output_env_var, "pnm", 10)) default_output = &pnm_output;
else if (~strncasecmp(default_output_env_var, "png", 10)) default_output = &png_output;
else if (~strncasecmp(default_output_env_var, "ps", 10)) default_output = &ps_output;
else {
    pthread_mutex_lock(&stdio_mutex);
    cerr << "WARNING! \"main\": \"The environment variable \"";
    cerr << "CONVEPS_DEFAULT_OUTPUT_FORMAT\" \" invalid value: \"";
    default_output_env_var << endl << "Will use PNG format instead." << endl;
    cerr << "Type \"<RETURN>\" to continue: \"
    getchar();
    pthread_mutex_unlock(&stdio_mutex);
    default_output = &png_output;
}
*default_output = 2;
default_output_env_var = 0;
(\Process command line options 15\)
```

52.

(Main 50) +≡

```c
if (VERBOSITY ≥ NORMAL) {
    cerr << "conveysVersion1.1.2.0.1\" << endl << "Copyright© 2003, 2004, 2005 The Free Software Foundation\" << endl << "Author: © Laurence D. H. Pinston" << endl << "conveys©-gnu© 3dldf© come© with© FREE © SOFTWARE © NOR© WARRANTY;\" << endl << "for details see the file COPYING© \" << endl << "which you should have received\" << endl << "in the distribution of GNU© 3DLD© 1.2.0.0© \" << endl << "This is free software and you are welcome\" << endl << "to redistribute it under certain conditions;" << endl << "for details again see the file COPYING© \" << endl << "Please send bug reports to help-3dldf@gnu.org\" << endl << "Visit my project at http://www.gnu.org/software/3dldf/LDF.html\" << endl << endl;
    } // if (VERBOSITY ≥ NORMAL) */
```
53. Set `tex_file_header`. [LDF 2005.09.01.]

[LDF 2006.09.01.] Added this section.

```
(Main 50) +≡
{   /* Beginning of group. */
    stringstream tex_stringstream;
    tex_stringstream << "\batchmode\input{epsf} \endl " "\def\epsfsize{#2(#1)} \endl "
        "\nopagenumbers \endl " "\parindent=0pt \endl ;
    if (portrait_or_landscape \equal LANDSCAPE) tex_stringstream << "\hspace=420mm \endl "
        "\vspace=297mm \endl " "\special{papersize=420mm,297mm} \endl ;
    else      /* (portrait_or_landscape \equal PORTRAIT) */
        tex_stringstream << "\hspace=297mm \endl " "\vspace=420mm \endl ;
    tex_stringstream << "\advance\voffset=1in \endl " "\advance\hoffset=1in \endl ;
    stream(tex_file_header, tex_stringstream.str().c_str());
} /* End of group. */
```
54.

```c
if (!((strlen(border_string) == 0) && strlen(horizontal_border_string) == 0 && strlen(vertical_border_string) == 0))
{
    if (strlen(horizontal_border_string) == 0) strcpy(horizontal_border_string, border_string);
    if (strlen(vertical_border_string) == 0) strcpy(vertical_border_string, border_string);
    if (strlen(border_color_string) == 0) strcpy(border_color_string, default_border_color_string);
    printf("\"-border\"%s\"-bordercolor\"%s\", horizontal_border_string, vertical_border_string, border_color_string);
}
```

```c
if (!(eps_output || jpeg_output || png_output || ps_output)) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"ERROR: Command line arguments suppress all output.\nexit 1\n");
    pthread_mutex_unlock(&stdio_mutex);
    return 1;
}
```

```c
#if DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr,"\"filename\":\"%s\", filename_stem);
    fprintf(stderr,"\"start_value\":\"%d\", start_value);
    fprintf(stderr,"\"end_value\":\"%d\", end_value);
    if (strlen(horizontal_border_string))
        fprintf(stderr,"\"horizontal_border_string\":\"%s\", horizontal_border_string);
    else fprintf(stderr,"\"horizontal_border_string\":\"is empty\"\n\n";
    if (strlen(vertical_border_string))
        fprintf(stderr,"\"vertical_border_string\":\"%s\", vertical_border_string);
    else fprintf(stderr,"\"vertical_border_string\":\"is empty\"\n\n";
    if (strlen(border_string))
        fprintf(stderr,"\"border_string\":\"%s\", border_string);
    else fprintf(stderr,"\"border_string\":\"is empty\"\n\n";
    if (eps_output) fprintf(stderr,"Producing\neps\"output.\n"");
    else fprintf(stderr,"Not\nproducing\neps\"output.\n"");
    if (jpeg_output) fprintf(stderr,"Producing\npng\"output.\n"");
    else fprintf(stderr,"Not\nproducing\npng\"output.\n"");
    if (png_output) fprintf(stderr,"Producing\nps\"output.\n"");
    else fprintf(stderr,"Not\nproducing\nps\"output.\n"");
    if (ps_output) fprintf(stderr,"Producing\nps\"output.\n"");
    else fprintf(stderr,"Not\nproducing\nps\"output.\n"");
    pthread_mutex_unlock(&stdio_mutex);
}
/* if (DEBUG) */
#endif /* DEBUG_COMPILE */
```
55. Write code for including EPS files to \texttt{texfile}. [LDF 2006.04.22.]

\begin{verbatim}
\texttt{(Main 50) +\equiv
  int i;
  float width;
  float height;
}\end{verbatim}
56. Set zeroes. [LDF 2006.08.22] 0

[LDF 2006.08.22] Added this section.

To Do

Find out how to use natural logarithms to find out how many places I need for zeroes.

(\text{Main 50}) +\equiv
\text{if (zeroes} \equiv 0) \text{ zeroes_string}[0] = '0';
\text{else if ((end_value + renumber_value) > 10000) }
\text{pthread_mutex_lock}(&\text{stdio_mutex});
\text{fprintf}(\text{stderr},'\text{ERROR}'"\text{'end_value'} + \text{'renumber_value'} = u\%d > u10,000.\n\text{an't handle this case yet. Exiting with return_value1.}'\n\text{end_value + renumber_value});
\text{pthread_mutex_unlock}(&\text{stdio_mutex});
\text{return 1};
\text{else if (end_value > 10000) */}
\text{else if ((end_value + renumber_value) \geq 1000 \land zeroes \leq 4) }
\text{zeroes} = 4;
\text{else if ((end_value + renumber_value) \geq 100 \land zeroes \leq 3) }
\text{zeroes} = 3;
\text{else if ((end_value + renumber_value) \geq 10 \land zeroes \leq 2) }
\text{zeroes} = 2;
\text{else if (zeroes < 0) }
\text{zeroes} = \text{DEFAULT_ZEROES;}
\text{*/ DEBUG_COMPILE */}
\text{if (DEBUG) }
\text{pthread_mutex_lock}(&\text{stdio_mutex});
\text{cerr }\ll \text{ "zeroes}" \ll \text{ zeroes }\ll \text{ endl;}
\text{pthread_mutex_unlock}(&\text{stdio_mutex});
\text{*/ DEBUG_COMPILE */}
\text{int i;}
\text{for (i = 0; i < zeroes; ++i) zeroes_string[i] = '0';}
\text{zeroes_string[i] = '
0';}
\text{*/ DEBUG_COMPILE */}
\text{if (DEBUG) }
\text{pthread_mutex_lock}(&\text{stdio_mutex});
\text{cerr }\ll \text{ "zeros_string_u" }\ll \text{ zeroes_string }\ll \text{ endl;}
\text{pthread_mutex_unlock}(&\text{stdio_mutex});
\text{*/ DEBUG_COMPILE */}
57. Log

[LDF 2006.08.22.] Now continuing if \( i \equiv 0 \) and \( \text{filename} \_\text{stem} \_\text{0} \) doesn't exist. [LDF 2006.08.22.]

```c
(Main 50) +≡
#elif DEBUG_COMPILE
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr,"\n\nstart_value_u\equiv=i\_d\_end_value_u\equiv=i\_d\_renumber_value_u\equiv=i\_d\_\n\nstart_value, end_value, renumber_value;
        pthread_mutex_unlock(&stdio_mutex);
    }
#endif /* DEBUG_COMPILE */
int threadCtr = 0;
char temp_file_name[MAX_FILENAME];
FILE *temp_file;
```

58. Log

[LDF 2006.08.27.] Added code for limiting the number of threads that can be active at one time. This is controlled by the global variable \texttt{unsigned short threads\_limit}, whose default value is \texttt{const unsigned short DEFAULT\_THREADS\_LIMIT} = 100. It can be reset by the command-line option \texttt{--threads\_limit}.

```c
(Main 50) +≡
{ /* Beginning of group. */
    int i = start_value; for (int k = 0; ; ++k) {
        if (i > end_value) break;
        for (i = start_value + (k * threads\_limit); i < start_value + (k * threads\_limit) + threads\_limit; ++i) {
            (Main 50) +≡
            if (i > end_value) break;
            sprintf(temp_file_name, "%s.%d", filename\_stem, i);
            if (DEBUG) {
                pthread_mutex_lock(&stdio_mutex);
                \texttt{err} <= "temp_file_name\equiv=i\_d\_ \texttt{err} <= \"'\" \texttt{err} <= \"temp_file_name \equiv \"'. \texttt{err} <= endl;
                pthread_mutex_unlock(&stdio_mutex);
            }
            temp_file = fopen(temp_file_name, "x");
        }
    }
}```
60.

[ LDF 2006.09.02 ] Now continuing if force_switch \equiv true.

```c
(Main 50) \equiv
  if (temps_file \equiv 0 \land (force_switch \lor i \equiv 0)) {
    #if DEBUG_COMPILE
      if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << filename << " isn't exist. Continuing." << endl;
        pthread_mutex_unlock(&stdio_mutex);
      }
    #endif /* DEBUG_COMPILE */
    continue; }
```
61.

[LDF 2005.08.27.] BUG FIX: Now setting i = end_value + 1 before breaking.

(Main 50) +\=

else
    if (temp_eps_file == 0) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << filename_stem << "." << i << "doesn't exist. UU" <<
            "Won't u_create any more threads. " << endl;
        pthread_mutex_unlock(&stdio_mutex);
        i = end_value + 1;
        break;
    } else fclose(temp_eps_file);
#endif /* DEBUG_COMPILE */
    thread_array[thread_ctr] = (pthread_t *) malloc(sizeof (pthread_t));
    thread_func_args[thread_ctr] = new Thread_Func_Arg_Type;
    thread_func_args[thread_ctr].eps_file_number = i;
    thread_func_args[thread_ctr].thread_ctr = thread_ctr;
    strcpy(thread_func_args[thread_ctr].zeroes_string, zeroes_string);
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << "zeroes_string=" << zeroes_string << endl;
        cerr << "thread_func_args[" << thread_ctr << "]->zeroes_string=" <<
            thread_func_args[thread_ctr].zeroes_string << endl;
        pthread_mutex_unlock(&stdio_mutex);
    }
#endif /* DEBUG_COMPILE */
    do {
        status = pthread_create(thread_array[thread_ctr], 0, thread_func, thread_func_args[thread_ctr]);
        if (status != 0) {
            pthread_mutex_lock(&stdio_mutex);
            cerr << "ERROR! In 'main()':
            " << 'pthread_create()' << 'failed, returning: " << status
            << "." << endl << "Going to sleep and will retry. " << endl;
            pthread_mutex_unlock(&stdio_mutex);
            sleep(1);
        } while (status != 0);
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << "After creating thread. " << endl;
        pthread_mutex_unlock(&stdio_mutex);
§61  conveys

```c
}  
#endif  /* DEBUG_COMPILE */
   ++ thread_ctr;    /* First inner for. Create threads. */
for (int j = 0 + (k * threads_limit); j < thread_ctr; ++j) {
    pthread_join(*(thread_array[j]),0);
    if (VERBOSITY >= VERBOSE) {
      pthread_mutex_lock(&stdio_mutex);
      fprintf(stderr,"Joined with thread\%d.\n",j);
      pthread_mutex_unlock(&stdio_mutex);
    }
    /* Second inner for. Join threads. */
}  /* Outer for */
/* End of group. */
```

62. End of main(). Exit successfully with return value 0. [LDF 2005.04.22.

( Main 50 ) +≡

```c
if (VERBOSITY > NORMAL) {
  pthread_mutex_lock(&stdio_mutex);
  fprintf(stderr,"Exiting with successfully returned value 0.\n\n");
  pthread_mutex_unlock(&stdio_mutex);
}
return 0;  /* End of main() definition. */
```

63.

(Declare thread function 63 ) ≡

```c
void *thread_func(void *v);
```

This code is used in section 78.
64.
(Define thread function 64) ≡

```c
void *thread_func(void *v) { bool DEBUG = false; /* true */
    char system_string[MAX_SYSTEM_STRING];
    char out_filename_stem[MAX_FILENAME];
    if (strlen(new_filename_stem)) strcpy(out_filename_stem, new_filename_stem);
    else strcpy(out_filename_stem, filename_stem);
    int status;
    Thread_FUNC_Arg_Type *arg_ptr = (Thread_FUNC_Arg_Type *) v;
    int i = arg_ptr->eps_file_number;
    int thread_ctr = arg_ptr->thread_ctr;
    FILE *tex_file;
    FILE *det_file;
    FILE *eps_file;
    char temp_file_name[MAX_FILENAME];
    char tex_file_name[MAX_FILENAME];
    char dvi_file_name[MAX_FILENAME];
    char ps_file_name[MAX_FILENAME];
    char pnm_file_name[MAX_FILENAME];
    char eps_file_name[MAX_FILENAME];
    char log_file_name[MAX_FILENAME];

    #if DEBUG_COMPILE

    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr,"Thread%d:Entering thread_func().\n", thread_ctr);
        pthread_mutex_unlock(&stdio_mutex);
    }
    #endif /* DEBUG_COMPILE */
```

See also sections 65, 66, 67, 68, 69, 70, 71, 73, and 74.

This code is used in section 78.
Set \texttt{arg\_ptr->zeroes\_string}.

```c
(LDF 2006.08.22] Added this section.

\begin{verbatim}
(Define thread function 64) +\equiv
int temp\_ctr = zeroes;
if ((i + renumber\_value) < 10) temp\_ctr -= 1;
else if ((i + renumber\_value) < 100) temp\_ctr -= 2;
else if ((i + renumber\_value) < 1000) temp\_ctr -= 3;
else temp\_ctr = 0;
#if DEBUG\_COMPILE
if (DEBUG) {
    pthread\_mutex\_lock(&stdio\_mutex);
    cerr << "temp\_ctr" << temp\_ctr << endl << "Before\: \u0026\u0026 arg\_ptr->zeroes\_string,\u0026\u0026 arg\_ptr->zeroes\_string << endl;
    pthread\_mutex\_unlock(&stdio\_mutex);
}
#endif  /* DEBUG\_COMPILE */
arg\_ptr->zeroes\_string[temp\_ctr] = '\0';
#endif DEBUG\_COMPILE
if (DEBUG) {
    pthread\_mutex\_lock(&stdio\_mutex);
    cerr << "After\: \u0026\u0026 arg\_ptr->zeroes\_string,\u0026\u0026 arg\_ptr->zeroes\_string << endl;
    pthread\_mutex\_unlock(&stdio\_mutex);
}
#endif  /* DEBUG\_COMPILE */
#endif DEBUG\_COMPILE
if (DEBUG) {
    pthread\_mutex\_lock(&stdio\_mutex);
    cerr << "Thread\: \u0026\u0026 thread\_ctr << \"\u0026\u0026 arg\_ptr->zeroes\_string,\u0026\u0026 arg\_ptr->zeroes\_string << endl;
    pthread\_mutex\_unlock(&stdio\_mutex);
}
#endif  /* DEBUG\_COMPILE */
\end{verbatim}
```
66.

(Define thread function 64) + =
sprintf(eps_file_name, ",%s.xd", filename_stem, i);
sprintf(tex_file_name, ",%s.xs%d.tex", out_filename_stem, arg_ptr-zeroes_string, (i + renumber_value));
sprintf(dvi_file_name, ",%s.xs%d.dvi", out_filename_stem, arg_ptr-zeroes_string, (i + renumber_value));
sprintf(log_file_name, ",%s.xs%d.log", out_filename_stem, arg_ptr-zeroes_string, (i + renumber_value));
sprintf(ps_file_name, ",%s.xs%d.ps", out_filename_stem, arg_ptr-zeroes_string, (i + renumber_value));
sprintf(pnm_file_name, ",%s.xs%d.pnm", out_filename_stem, arg_ptr-zeroes_string, (i + renumber_value));
tex_file = fopen(tex_file_name, ",w");
#endif DEBUG_COMPILE

if (DEBUG) {
  pthread_mutex_lock(&stdio_mutex);
  fprintf(stderr, "%%s\%%s\%%s\%%s\n", thread_ctr, eps_file_name);
  fprintf(stderr, "%%s\%%s\%%s\%%s\n", thread_ctr, tex_file_name);
  fprintf(stderr, "%%s\%%s\%%s\%%s\n", thread_ctr, dvi_file_name);
  fprintf(stderr, "%%s\%%s\%%s\%%s\n", thread_ctr, log_file_name);
  fprintf(stderr, "%%s\%%s\%%s\%%s\n", thread_ctr, ps_file_name);
  fprintf(stderr, "%%s\%%s\%%s\%%s\n", thread_ctr, pnm_file_name);
  pthread_mutex_unlock(&stdio_mutex);
}

#if DEBUG_COMPILE */

fprintf(tex_file, 
  "%%s\%%s\%%s\%%s\n", system_string, tex_file_name);
#endif

if (VERBOSE >= VERBOSITY) {
  pthread_mutex_lock(&stdio_mutex);
  fprintf(stderr, "%%s\%%s\%%s\%%s\n", thread_ctr, system_string);
  pthread_mutex_unlock(&stdio_mutex);
}

while (status != 0) {
  status = system(system_string);
  if (status != 0) {
    pthread_mutex_lock(&stdio_mutex);
    perror("Thread", ",%s", thread_ctr);
    perror("thread_func":\n" << "system()\n" << status << ",\n", thread_ctr, system_string);
    sleep(1);
  }
}

if (VERBOSE >= VERBOSITY) {
  pthread_mutex_lock(&stdio_mutex);
  perror("Thread", ",%s", system_string);
  perror("status":\n", thread_ctr, system_string);
  pthread_mutex_unlock(&stdio_mutex);
}
(Define thread function 64) + ṯ
printf(system_string, "rm\-f\%s", ps_file_name);
if (VERBOSITY ≥ VERBOSE) {
    pthread_mutex_lock(&stdio_mutex);
    cerr << "Thread_" << thread_ctr << ": execute " << system_string << ", status: " << endl;
    pthread_mutex_unlock(&stdio_mutex);
}
status = system(system_string);
if (status ≠ 0) {
    pthread_mutex_lock(&stdio_mutex);
    cerr << "Thread_" << thread_ctr << ": WARNING! In 'thread_func':\n" << ": failed, returning\", status: " << endl;
    "Going_to_sleep_and_will_retry."
    pthread_mutex_unlock(&stdio_mutex);
    sleep(1);
}
while (status ≠ 0);
#if DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr << ": execute " << system_string << ", returned\", status: " << endl;
    pthread_mutex_unlock(&stdio_mutex);
}
#endif /* DEBUG_COMPILE */
68. Log

[1DF 2006.09.02] Added this section.
[1DF 2006.09.02] BUG FIX: Added +antialias option.

(Define thread function 64) +

    sprintf(system_string,"mogrify%santialias=%s-crop_0x0\%s",ps_file_name);
    if (VERBOSITY >= NORMAL) {
        pthread_mutex_lock(&stdio_mutex);
        errr << "Thread_id << threadCtr << ":" << Executing << "system_string " << "." << endl;
        pthread_mutex_unlock(&stdio_mutex);
    }
    status = system(system_string);

69. Log

[1DF 2006.09.01] Added this section. BUG FIX: Now rotating the image in a separate call to mogrify. Doing it in combination with other options had been working, but then I started getting incorrect results.
[1DF 2006.09.02] BUG FIX: Added +antialias option.

(Define thread function 64) +

    if (portrait_or_landscape == LANDSCAPE) {
        sprintf(system_string,"mogrify%santialias=%s-rotate_90\%s",ps_file_name);
        if (VERBOSITY >= NORMAL) {
            pthread_mutex_lock(&stdio_mutex);
            errr << "Thread_id << threadCtr << ":" << Executing << "system_string " << "." << endl;
            pthread_mutex_unlock(&stdio_mutex);
        }
        status = system(system_string);
    } /* if (portrait_or_landscape == LANDSCAPE) */
    if (coerce_value == 0) strcpy(coerce_string,"");
    else if (coerce_value == 1) strcpy(coerce_string,"-geometry_320x240!");
    else if (coerce_value == 2) strcpy(coerce_string,"-geometry_640x480!");
    else {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr,"Thread_id:ERROR!In\nmain()":invalid\nvalue for\n_value\n
Setting\ncoerce_string\nto\"\"""and\ncontinuing\n":threadCtr,
coerce_value);
        pthread_mutex_unlock(&stdio_mutex);
        strcpy(coerce_string,""");
    }
70.

[LDI 2006.10.30.] BUG FIX: No longer including `border_color_string` in `system_string`. It's already included in `border_string`.

```c
#define thread_function 64 +

if (strlen(coerce_string) ∨ strlen(opaque_string) ∨ strlen(border_string) ∨ strlen(negate_string)) {
    sprintf(system_string, "mogrify1\+antialias\+\+\+\+\+\+, border_string, fill_string,
            opaque_string, coerce_string, negate_string, ps_file_name);
    if (VERBOSITY ≥ NORMAL) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << "Thread_n" << threadCtr << ":\"Executing\" system_string \"\". \"\" endl;
        pthread_mutex_unlock(&stdio_mutex);
    }
    do {
        status = system(system_string);
        if (status ≠ 0) {
            pthread_mutex_lock(&stdio_mutex);
            cerr << "Thread_n" << threadCtr << ":\"ERROR\" In Thread\" thread_func:\n" << 
            "system() \"failed\", returning\" \" status \". \" \" endl;
            "Going to sleep and will retry.\" \" endl;
            pthread_mutex_unlock(&stdio_mutex);
            sleep(1);
        }
    } while (status ≠ 0);
} #if DEBUG_COMPILE
    if (DEBUG) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << "Thread_n" << threadCtr << ":\" system_string \" \" returned\" \" status \". \" \" endl;
        pthread_mutex_unlock(&stdio_mutex);
    }
    #endif /* DEBUG_COMPILE */
} /* if (strlen(coerce_string) ∨ strlen(opaque_string) ∨ strlen(border_string)) */
71.

[LD 2006.04.25.] Now calling `remove()` rather than using “rm” in calls to `system()`.
[LD 2006.05.08.] Commented-out the code that converts the EPS files to PNG.
[LD 2006.08.31.] Now using “rm -f” in calls to `system()` instead of calling `remove()`. Removed the loops that tried to remove the files and put the thread to sleep upon failure.

```c
{Define thread function 64} +≡
if (eps_output) {
    strcpy(output_extension, "eps");
    (Convert PS file 72)
}
if (jpg_output) {
    strcpy(output_extension, "jpg");
    (Convert PS file 72)
}
if (pmn_output) {
    strcpy(output_extension, "pmn");
    (Convert PS file 72)
}
if (png_output) {
    strcpy(output_extension, "png");
    (Convert PS file 72)
}
if (VERBOSITY ≥ VERBOSE) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Thread%d: Removing %s\n", thread_ctr, tex_file_name);
    pthread_mutex_unlock(&stdio_mutex);
}
    printf(system_string, "rm -f %s", tex_file_name);
    status = system(system_string);
    if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << ":WARNING!\nIn\n'thread_func': " << endl <<
            "Failed to delete\n'" << tex_file_name << ",\nContinuing." << endl;
        pthread_mutex_unlock(&stdio_mutex);
    } /* if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) */
if (VERBOSITY ≥ VERBOSE) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Thread%d: Removing %s\n", thread_ctr, dvi_file_name);
    pthread_mutex_unlock(&stdio_mutex);
}
    printf(system_string, "rm -f %s", dvi_file_name);
    status = system(system_string);
    if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) {
        pthread_mutex_lock(&stdio_mutex);
        cerr << ":WARNING!\nIn\n'thread_func': " << endl <<
            "Failed to delete\n'" << dvi_file_name << ",\nContinuing." << endl;
        pthread_mutex_unlock(&stdio_mutex);
    } /* if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) */
§72

(Convert PS file ?2) ≡

```c
sprintf(system_string, "convert\%s\%s\%s\%s\%s\%s\%s\%d\%s", transparent_string, coerce_string,
        ps_file_name, out_filename_stem, any_ptr-zeros_string, (i + renumber_value), output_extension);

if (VERBOSITY ≥ NORMAL) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Thread\%d: Executing\%s.\n", thread_num, system_string);
    pthread_mutex_unlock(&stdio_mutex);
}

do {
    status = system(system_string);
    if (status ≠ 0) {
        pthread_mutex_lock(&stdio_mutex);
        cerr ≡ "Thread\%d\%s thread\%d\%s system\%s\%s\%s\" \%d\%s\" returned\%d\%s\%s\%d\%s\" \%d\%s\%s\%d\%s\%
        "Going to sleep and will retry." \%d
        pthread_mutex_unlock(&stdio_mutex);
        sleep(1);
    }
} while (status ≠ 0);

#ifdef DEBUG_COMPILE
if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≡ "Thread\%d\%s thread\%d\%s\%s\%s\%s\" \%d\%s\%s\%d\%s\%s\%d\%s\%s\%d\%s\%
    "system\%s\%s\%d\%s\%s\%d\%s\%s\%d\%s\%s\%d\%s\%
    pthread_mutex_unlock(&stdio_mutex);
}
#endif  /* DEBUG_COMPILE */
```

This code is used in section 71.
(Define thread function 64) +=
  if (!ps_output) {
    if (VERBOSITY >= VERBOSE) {
      pthread_mutex_lock(&stdio_mutex);
      printf(stderr, "Thread \%d: Removing \%s\n", thread_ctr, ps_file_name);
      pthread_mutex_unlock(&stdio_mutex);
    }
    status = remove(ps_file_name);
    if (status != 0) {
      perror("Removing \%s\n", ps_file_name);
      pthread_mutex_unlock(&stdio_mutex);
    } /* if (status != 0) */
  } /* if (!ps_output) */
#if DEBUG_COMPILE
else
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    perror("Removing \%s\n", ps_file_name);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif /* DEBUG_COMPILE */
74. (Define thread function 64) +=
   if (VERBOSITY >= VERBOSITY)
     pthread_mutex_lock(&stdio_mutex);
     printf(stderr, "Thread %d: Removing %s\n", thread_id, log_file_name);
     pthread_mutex_unlock(&stdio_mutex);
   }
   status = remove(log_file_name);
   if (status != 0 && VERBOSITY >= NORMAL)
     pthread_mutex_lock(&stdio_mutex);
     fprintf(stderr, "Thread %d: Thread %d: WARNING: Failed to remove %s\n", thread_id, thread_count, log_file_name);
     fprintf(stderr, "Thread %d: Continuing.\n", thread_id);
     pthread_mutex_unlock(&stdio_mutex);

#define DEBUG_COMPILE
if (DEBUG) {
  pthread_mutex_lock(&stdio_mutex);
  fprintf(stderr, "Thread %d: Thread %d: Exiting, thread_func() succeeded\n", thread_id, thread_count);
  pthread_mutex_unlock(&stdio_mutex);
}
#endif /* DEBUG_COMPILE */
define argv_ptr;
argv_ptr = 0;
return 0; /* End of thread_func() definition. */

75. GNU Free Documentation License. The GNU Free Documentation License, which follows, applies to this document.

GNU Free Documentation License
Version 1.2, November 2002

59 Temple Place, Suite 330, Boston, MA 02111-1307 USA
Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

0. PREAMBULE

The purpose of this License is to make a manual, textbook, or other functional and useful document “free” in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or noncommercially. Secondly, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of “copyleft”, which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to text manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.
1. APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a worldwide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The “Document”, below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as “you”. You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A “Modified Version” of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A “Secondary Section” is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document’s overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The “Invariant Sections” are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The “Cover Texts” are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 23 words.

A “Transparent” copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not “Transparent” is called “Opaque”.

Examples of suitable formats for Transparent copies include plain ASCII without markup, TeXinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The “Title Page” means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, “Title Page” means the text near the most prominent appearance of the work’s title, preceding the beginning of the body of the text.

A section “Entitled XYZ” means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as “Acknowledgements”, “Dedications”, “Endorsements”, or “History.”) To “Preserve the Title” of such a section when you modify the Document means that it remains a section “Entitled XYZ” according to this definition.
The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties; any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

2. VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

3. COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

4. MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

A. Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.
B. List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement. C. State
on the Title page the name of the publisher of the Modified Version, as the publisher. D. Preserve all the copyright notices of the Document. E. Add an appropriate copyright notice for your modifications adjacent to the other copyright notices. F. Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below. G. Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document’s license notice. H. Include an unaltered copy of this License. I. Preserve the section Entitled “History”, Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled “History” in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence. J. Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the “History” section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission. K. For any section Entitled “Acknowledgements” or “Dedications”, Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein. L. Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles. M. Delete any section Entitled “Endorsements”. Such a section may not be included in the Modified Version. N. Do not retitle any existing section to be Entitled “Endorsements” or to conflict in title with any Invariant Section. O. Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version’s license notice. These titles must be distinct from any other section titles.

You may add a section Entitled “Endorsements”, provided it contains nothing but endorsements of your Modified Version by various parties—for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

5. COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.
In the combination, you must combine any sections Entitled "History" in the various original documents, forming one section Entitled "History"; likewise combine any sections Entitled "Acknowledgements", and any sections Entitled "Dedications". You must delete all sections Entitled "Endorsements".

6. COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

7. AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an "aggregate" if the copyright resulting from the compilation is not used to limit the legal rights of the compilation's users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document's Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

8. TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled "Acknowledgements", "Dedications", or "History", the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided for under this License. Any other attempt to copy, modify, sublicense or distribute the Document is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See http://www.gnu.org/copyleft/.
Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License "or any later version" applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation.

ADDENDUM: How to use this License for your documents

To use this License in a document you have written, include a copy of the License in the document and put the following copyright and license notices just after the title page:

Copyright © YEAR YOUR NAME. Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the "with...Texts." line with this:

with the Invariant Sections being LIST THEIR TITLES, with the Front-Cover Texts being LIST, and with the Back-Cover Texts being LIST.

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.

(GNU Free Documentation License 75) 75/* This section contains no C++ code. */
This code is cited in section 2.
This code is used in section 78.

76. GNU General Public License. The GNU General Public License, which follows, applies to the program 3DLDF described in this document.

GNU GENERAL PUBLIC LICENSE
Version 2, June 1991

Copyright © 1989, 1991 Free Software Foundation, Inc.
51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA
Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software—to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this
service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author’s protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors’ reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone’s free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE
TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The “Program”, below, refers to any such program or work, and a “work based on the Program” means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term “modification”.) Each licensee is addressed as “you”.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program’s source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimers of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

   a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

   b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

   c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.
5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and “any later version”, you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY
11. Because the program is licensed free of charge, there is no warranty for
the program, to the extent permitted by applicable law. Except when oth-
erwise stated in writing the copyright holders and/or other parties provide
the program "as is" without warranty of any kind, either expressed or im-
plied, including, but not limited to, the implied warranties of merchantabili-
ity and fitness for a particular purpose. The entire risk as to the quality and
performance of the program is with you. Should the program prove defec-
tive, you assume the cost of all necessary servicing, repair or correction.

12. In no event unless required by applicable law or agreed to in writing
will any copyright holder, or any other party who may modify and/or re-
distribute the program as permitted above, be liable to you for damages,
including any general, special, incidental or consequential damages arising
out of the use or inability to use the program (including but not limited to
loss of data or data being rendered inaccurate or losses sustained by you
or third parties or a failure of the program to operate with any other pro-
grams), even if such holder or other party has been advised of the possibility
of such damages.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best
way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source
file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright"
line and a pointer to where the full notice is found.

   (one line to give the program's name and a brief idea of what it does.)
   Copyright (C) (year) (name of author)

This program is free software; you can redistribute it and/or modify it under the terms of the
GNU General Public License as published by the Free Software Foundation; either version 2 of
the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WAR-
RANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A
PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program;
if not, write to the Free Software Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA
02111-1307 USA

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

   Gnomovision version 69, Copyright (C) year name of author
   Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type 'show w'.
   This is free software, and you are welcome to redistribute it under certain conditions; type
   'show c' for details.

The hypothetical commands 'show w' and 'show c' should show the appropriate parts of the General
Public License. Of course, the commands you use may be called something other than 'show w' and 'show
c'; they could even be mouse-clicks or menu items—whatever suits your program.
You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program 'Gnomovision' (which makes passes at compilers) written by James Hacker.

(signature of Ty Coon), 1 April 1989 Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Library General Public License instead of this License.

(GNU General Public License 76) ≡ /* This section contains no C++ code. */
This code is cited in section 2.
This code is used in section 78.

### 77. Putting conveys together.

This is what’s compiled.

```c
#include "...

#define...  1

(c_str)

-default_border_color_string  11 50 54
-default_border_string  11 50
-default_border_value  10 16 25 41 50
-default_end_value  10 49
-default_output  11 31 51
-default_output_filename  51

digit_opt  11

-default-zeroes  10 56
```

### 78. Version control identifier

```c
version_control 1
```

### 79. Include files

```c
#include ...
```

### 80. Preprocessor macros

```c
#define...
```

### 81. Type declarations

```c
type ...
```

### 82. Global constants

```c
global_constant 10
```

### 83. Declare Thread_Arg_Type

```c
declare_thread_function 63
```

### 84. Main

```c
main 50
```

### 85. GNU Free Documentation License

```c
(gnu free documentation license 75)
```

### 86. GNU General Public License

```c
(gnu general public license 76)
```

### 87. Define thread function

```c
define_thread_function 64
```
eps_output: 11, 31, 51, 54, 71.
exit: 24, 40.
false: 11, 12, 15, 61.
fclose: 61, 66.
filename stem: 11, 48, 54, 57, 59, 60, 61, 64, 66.
fill_index: 11, 20.
fill string: 11, 20, 50, 70.
fopen: 59, 66.
force_index: 11, 21.
force switch: 11, 19, 21, 49, 60.
fprintf: 16, 17, 18, 19, 20, 22, 23, 24, 25, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 54, 56, 57, 61, 62, 64, 66, 67, 69, 71, 72, 73, 74.
getchar: 51.
getenv: 51.
getlong only: 15.
GRAY_NEGATE_INDEX: 11, 21, 22.
height: 55.
HEIGHT_INDEX: 11, 23.
height value: 11, 23.
HELP_INDEX: 14, 24.
HORIZONTAL_BORDER_INDEX: 11, 25.
horizontal_border_string: 11, 25, 50, 54.
i: 55, 56, 58, 61.
j: 61.
jpeg_output: 11, 31, 51, 54, 71.
k: 58.
LANDSCAPE: 10, 11, 26, 53, 69.
LANDSCAPE_INDEX: 14, 26.
log file name: 64, 66, 74.
long options: 14, 15.
main: 50, 62.
malloc: 61.
MAX BORDER STRING: 10, 11.
MAX COERCETYPE STRING: 10, 11.
MAX COLOR STRING: 10, 11.
MAX DATESTRAMP: 10.
MAX FILENAME: 10, 11, 57, 64.
MAX OUTPUT EXTENSION: 10, 11.
MAX SYSTEM STRING: 10, 64.
MAX_TEX_FILE HEADER: 10, 11.
MAX ZEROES STRING: 9, 10, 12.
name: 15.
NEGATE_INDEX: 14, 27.
NEGATE STRING: 11, 22, 27, 70.
NEW_FILENAME INDEX: 14, 28.
new filename stem: 11, 28, 50, 64.
NO ZEROES_INDEX: 14, 29.
NORMAL: 10, 50, 52, 62, 67, 68, 69, 70, 71, 72, 73, 74.
OPAQUE_INDEX: 14, 30.
OPAQUE STRING: 11, 30, 50, 70.
OPTION: 15, 16, 17, 18, 19, 20, 23, 25, 28, 30, 31, 34, 36, 37, 38, 41, 42, 43.
OPTION FLAG: 14, 48.
OPTION CTR: 11, 15, 44, 45.
OPTION INDEX: 11, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44.
OUT_FILENAME_STEM: 64, 66, 72.
OUTPUT_FORMAT_INDEX: 11, 31.
PROTO FILE: 11, 31, 51, 54, 71.
PROTO_FILE_NAME: 64, 66.
PORTAIT: 10, 32, 53.
PORTAIT_INDEX: 11, 32.
PORTAIT OR LANDSCAPE: 11, 26, 32, 53, 69.
PS FILE: 64.
PS FILE NAME: 64, 66, 67, 68, 69, 70, 72, 73.
PS OUTPUT: 11, 31, 51, 54, 73.
THREAD CREATE: 61.
THREAD JOIN: 61.
THREAD_MUTEX_INIT: 50.
THREAD_MUTEX_LOCK: 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 51, 54, 56, 57, 59, 60, 61, 62, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74.
THREAD_MUTEX_UNLOCK: 11.
THREAD_MUTEX_TAKE: 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 51, 54, 56, 57, 59, 60, 61, 62, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74.
THREAD T: 11, 61.
THREAD_THREADS_MAX: 11.
QUIET: 10, 33.
QUIET_INDEX: 14, 33.
REST_ID: 1.
remove: 67, 71, 73, 74.
RENUMBER_INDEX: 14, 34.
RENUMBER VALUE: 11, 34, 56, 57, 65, 66, 72.
Signed_BYTE: 8.
SILENT: 10, 35.
SILENT_INDEX: 14, 35.
sleep: 61, 66, 67, 70, 72.
SSCONF: 19, 23, 28, 34, 36, 37, 42, 43, 48, 49.
START_INDEX: 14, 36.
START VALUE: 11, 36, 48, 54, 57, 58.
status: 12, 61, 64, 66, 67, 68, 69, 70, 71, 72, 73, 74.
std: 6.
stderr: 16, 17, 18, 19, 20, 22, 23, 24, 25, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 54, 56, 57, 61, 62, 64, 66, 67, 69, 71, 72, 73, 74.
stdiomutex: 11, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 54, 56, 57, 59, 60, 61, 62, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74.
str: 53.
strcascmp: 18, 31.
strcpy: 16, 22, 25, 27, 41, 48, 50, 53, 54, 61, 64, 69, 71.
stringstream: 53.
strlen: 51, 54, 64, 70.
strncascmp: 51.
system_string: 61, 66, 67, 68, 69, 70, 71, 72.
temp_str: 65.
temp_cps_file: 57, 59, 60, 61.
temp_cps_file_name: 57, 59.
temp_file: 55.
temp_file_name: 64.
text_file: 55, 64, 66.
text_file_header: 11, 53, 66.
text_file_name: 64, 66, 71.
text_stringstream: 53.
this_option_optind: 11.
thread_array: 11, 61.
thread_cstr: 2, 52, 61, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74.
thread_func: 61, 63, 64, 74.
Thread_Arg_Type: 2, 11, 61, 64.
thread_func_args: 11, 61.
threads_limit: 11, 37, 58, 61.
THREADS_LIMIT_INDEX 11, 37.
TO DO: 56.
TRANSPARENT_INDEX: 11, 38.
transparent_string: 11, 38, 50, 72.
true: 12, 15, 19, 21, 49, 60, 64.
Unsigned_Byte: 8, 10, 11, 48, 51.
v: 63, 64.
VERBOSE: 10, 39, 61, 66, 67, 71, 73, 74.
VERBOSE_INDEX: 11, 39.
VERBOSITY: 11, 33, 35, 39, 50, 52, 61, 62, 66, 67, 68, 69, 70, 71, 72, 73, 74.
VERSION_INDEX: 11, 40.
VITAL_INDEX: 11, 41.
vertical_border_string: 11, 41, 50, 54.
width: 55.
(Convert PS file 72) Used in section 71.
(Declarations for command line options 14) Used in section 50.
(Declare thread function 63) Used in section 78.
(Declare Thread_func_Arg_Type 9) Used in section 78.
(Define thread function 64, 65, 66, 67, 68, 69, 70, 71, 73, 74) Used in section 78.
(GNU Free Documentation License 75) Cited in section 2. Used in section 78.
(GNU General Public License 76) Cited in section 2. Used in section 78.
(Global constants 10) Used in section 78.
(Global variables 11) Used in section 78.
(Include files 6) Used in section 78.
(Local variables for main() 12) Used in section 50.
(Main 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62) Used in section 78.
(Preprocessor macros 7) Used in section 78.
(Process command line options 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47) Used in section 51.
(Process filenames 48, 49) Used in section 54.
(Type declarations 8) Used in section 78.
(Version control identifier 1) Used in section 78.
convesp
Version 1.2.0
by Laurence D. Finston
December 2005

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>convesp</td>
<td>1</td>
</tr>
<tr>
<td>Copyright and License</td>
<td>2</td>
</tr>
<tr>
<td>Instructions for use</td>
<td>3</td>
</tr>
<tr>
<td>Generating the executable convesp</td>
<td>4</td>
</tr>
<tr>
<td>Invoking convesp</td>
<td>5</td>
</tr>
<tr>
<td>Preprocessor macros</td>
<td>7</td>
</tr>
<tr>
<td>Type declarations</td>
<td>8</td>
</tr>
<tr>
<td>Declare Thread_Func_Arg_Type</td>
<td>9</td>
</tr>
<tr>
<td>Local variables for main()</td>
<td>12</td>
</tr>
<tr>
<td>Command line options</td>
<td>13</td>
</tr>
<tr>
<td>Declarations for command line options</td>
<td>14</td>
</tr>
<tr>
<td>Process command line options</td>
<td>15</td>
</tr>
<tr>
<td>Border</td>
<td>16</td>
</tr>
<tr>
<td>Bordercolor</td>
<td>17</td>
</tr>
<tr>
<td>coerce</td>
<td>18</td>
</tr>
<tr>
<td>gray-negate</td>
<td>22</td>
</tr>
<tr>
<td>Horizontal Border</td>
<td>25</td>
</tr>
<tr>
<td>landscape</td>
<td>26</td>
</tr>
<tr>
<td>portrait</td>
<td>32</td>
</tr>
<tr>
<td>quiet</td>
<td>33</td>
</tr>
<tr>
<td>silent</td>
<td>35</td>
</tr>
<tr>
<td>verbose</td>
<td>39</td>
</tr>
<tr>
<td>Ambiguous option</td>
<td>45</td>
</tr>
<tr>
<td>Invalid option</td>
<td>46</td>
</tr>
<tr>
<td>Process filenames</td>
<td>48</td>
</tr>
<tr>
<td>Main</td>
<td>50</td>
</tr>
<tr>
<td>Set tex_file_header</td>
<td>53</td>
</tr>
<tr>
<td>GNU Free Documentation License</td>
<td>75</td>
</tr>
<tr>
<td>GNU General Public License</td>
<td>76</td>
</tr>
<tr>
<td>Putting convesp together</td>
<td>77</td>
</tr>
</tbody>
</table>