1. `converps.` Convert Encapsulated PostScript to structured PostScript and PNG (`converps.web`).

Log

[LDF 2005.04.22.] This program now works. It could be refined, though.

⟨ Version control identifier 1 ⟩ ≡
static char *rcs_id*[ ] = "$Id: converps.web,v 1.32 2009/08/20 11:24:17 lfinsto1 Exp $";
This code is used in section 81.

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Please send bug reports to:
`lfinsto1@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.

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3. Instructions for use. [LDF 2005.05.02.]

Log

[LDF 2005.05.02.] Copied the text in this section from `~/EXAMPLES/CROPPING/00README` and edited it.

`conveps` 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 ⟨*filename*⟩`.0` doesn't exist, `conveps` tries to process ⟨*filename*⟩`.1`. If a file fails to exist for a larger number, `conveps` will exit.

Given the files `3DLDFmp.1`, `3DLDFmp.2`, and `3DLDFmp.3`, "`conveps 3DLDFmp 1 3`" will generate the files `3DLDFmp_1.pnm`, `3DLDFmp_2.pnm`, and `3DLDFmp_3.pnm`.

`conveps` 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: `--`⟨*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 ("man pages") for more information. Color arguments containing parentheses should be quoted, to prevent the shell from treating them as special characters.

`--border` Optional numerical argument. If n is the argument, a border of n pixels is added to the image. If no argument is used, the default value of 10 is used.

`--bordercolor` Required color argument. Used together with the `--border`, `--horizontal-border`, or `--vertical-border` options. If not used, the border will be white.

`--coerce` Optional argument. If no argument is used, the image is coerced to 640×480 pixels. If the argument "`s`" (for "small") is used, it is coerced to 320×240 pixels. If any other argument is used, `conveps` issues a warning and coerces the image to 640×480 pixels.

`--end` Required numerical argument. The number of the last file EPS to be processed.

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

`--force` No argument. If no `--end` argument is used, `--force` will cause `conveps` to continue trying to find files to convert until it reaches the default value (currently 100).

`--gray-negate` No argument. Grayscale pixel values are negated. See also the `--negate` option.

`--height` Required numerical argument. Currently not used for anything.

`--help` No argument. Prints information about `conveps` to standard output and exits.

`--horizontal-border` Optional numerical argument. If n is the argument, a border of 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.

`--landscape` The TEX files that include the images will be in DIN A3 landscape format, i.e., width 420mm and height 297mm.

`--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 `converps`. [LDF 2005.04.26.]

Log

[LDF 2005.08.24.] Revised.

To generate the executable `converps`, call
'`make converps`' from a shell. Alternatively, you can call '`ctangle converps.web`' and '`gcc -o converps -g -pthread co`

5. Invoking `conveps`. [LDF 2005.08.24.]

6. Include files. [LDF 2005.04.21.]

⟨ Include files 6 ⟩ ≡

```
#include "config.h"
#include <ctype.h>
#include <getopt.h>
#include <iomanip>
#include <ios>
#include <iostream>
#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 81.

7. Preprocessor macros. [LDF 2005.08.18.]

Log

[LDF 2005.08.18.] Added this section.

⟨ Preprocessor macros 7 ⟩ ≡
```
#define DEBUG_COMPILE 1
```
This code is used in section 81.

8. Type declarations. [LDF 2005.04.21.]

⟨ Type declarations 8 ⟩ ≡
```
typedef char Byte;
typedef Byte Signed_Byte;
typedef unsigned char Unsigned_Byte;
```
This code is used in section 81.

9. Declare Thread_Func_Arg_Type. =

Log

[LDF 2005.08.26.] Added this section.

⟨ Declare **Thread_Func_Arg_Type** 9 ⟩ ≡

```
struct Thread_Func_Arg_Type {
  int eps_file_number;
  int thread_ctr;
  char zeroes_string[MAX_ZEROES_STRING];
};
```

This code is used in section 81.

10. Global constants. [LDF 2005.04.21.]

Log

[LDF 2005.09.02.] Added **const unsigned short** DEFAULT_END_VALUE = 100.
[2009.01.14.] Changed DEFAULT_BORDER_VALUE from 10 to 0.

⟨ Global constants 10 ⟩ ≡

```
const Unsigned_Byte 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 = 0;
const unsigned short DEFAULT_END_VALUE = 100;
const unsigned short MAX_COLOR_STRING = 128;
const unsigned short MAX_ZEROES_STRING = 16;
const unsigned short DEFAULT_ZEROES = 2;
const unsigned short MAX_COERCE_STRING = 32;
const unsigned short MAX_OUTPUT_EXTENSION = 8;
const unsigned short DEFAULT_THREADS_LIMIT = 100;
const Unsigned_Byte SILENT = 0;
const Unsigned_Byte QUIET = 1;
const Unsigned_Byte NORMAL = 2;
const Unsigned_Byte VERBOSE = 3;
const Unsigned_Byte PORTRAIT = 0;
const Unsigned_Byte LANDSCAPE = 1;
```

This code is used in section 81.

11. Global variables. [LDF 2005.08.18.]

Log

[LDF 2005.09.02.] Added **bool** *force_switch* = *false*.
[LDF 2005.12.16.] Added **Unsigned_Byte** ∗*default_output*.
[LDF 2008.12.29.] Replaced `PTHREAD_THREADS_MAX` with 8192 (2^13). `PTHREAD_THREADS_MAX` should be defined in `limits.h`, but I can't find a definition on the machine I'm currently using. On another machine, it was $16384 = 2^{14}$.

⟨ Global variables 11 ⟩ ≡

```
Unsigned_Byte VERBOSITY;
char filename_stem[MAX_FILENAME];
char new_filename_stem[MAX_FILENAME];
int start_value = -1;
int end_value = -1;
char border_string[MAX_BORDER_STRING];
char vertical_border_string[MAX_BORDER_STRING];
char horizontal_border_string[MAX_BORDER_STRING];
char default_border_string[MAX_BORDER_STRING];
char border_color_string[MAX_COLOR_STRING];
char default_border_color_string[MAX_COLOR_STRING];
Unsigned_Byte eps_output = 0;
Unsigned_Byte jpeg_output = 0;
Unsigned_Byte pnm_output = 0;
Unsigned_Byte png_output = 0;
Unsigned_Byte ps_output = 0;
Unsigned_Byte *default_output = 0;
bool force_switch = false;
char fill_string[MAX_COLOR_STRING];
char opaque_string[MAX_COLOR_STRING];
char transparent_string[MAX_COLOR_STRING];
char negate_string[16] = "";
signed int zeroes = -1;
unsigned int height_value = 0;
unsigned int width_value = 0;
unsigned int renumber_value = 0;
Unsigned_Byte coerce_value = 0;
Unsigned_Byte portrait_or_landscape = PORTRAIT;
char coerce_string[MAX_COERCE_STRING];
char output_extension[MAX_OUTPUT_EXTENSION];
pthread_t * thread_array[8192];
  /* Formerly PTHREAD_THREADS_MAX. See log entry above. [LDF 2008.12.29.] */
Thread_Func_Arg_Type *thread_func_args[8192];      /* As above. [LDF 2008.12.29.] */
pthread_mutex_t stdio_mutex;
unsigned short threads_limit = DEFAULT_THREADS_LIMIT;
char tex_file_header[MAX_TEX_FILE_HEADER];
```

This code is used in section 81.

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

Log

[LDF 2005.08.18.] Added this section.

⟨ Local variables for *main*( ) 12 ⟩ ≡

```
bool DEBUG = false;      /* true */
int status;
char zeroes_string[MAX_ZEROES_STRING];
```

This code is used in section 50.

13. Command line options. [LDF 2005.08.18.]

Log

[LDF 2005.08.18.] Added this section.

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

Log

[LDF 2005.08.18.] Added this section.

⟨ Declarations for command line options 14 ⟩ ≡

```
int option_ctr;
int digit_optind = 0;
const unsigned short BORDER_INDEX = 0;
const unsigned short BORDER_COLOR_INDEX = 1;
const unsigned short COERCE_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_ZEROES_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 VERBOSE_INDEX = 23;
const unsigned short VERSION_INDEX = 24;
const unsigned short VERTICAL_BORDER_INDEX = 25;
const unsigned short WIDTH_INDEX = 26;
const unsigned short ZEROES_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},
    {"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}, {"zeroes", 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 2005.08.18.]

Log

[LDF 2005.08.18.] Added this section.

```
⟨ Process command line options 15 ⟩ ≡
  DEBUG = false;      /* true */
  ; while (1) { option_ctr = getopt_long_only(argc, argv, "cefghlnopqrstvwz", 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␣" ≪ long_options[option_index].name;
    if (optarg) cerr ≪ "␣with␣arg␣" ≪ 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.]

Log

[LDF 2005.08.24.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  if (option_index ≡ BORDER_INDEX) {
  if (optarg) strcpy(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.]

Log

[LDF 2005.08.24.] Added this section.

```
⟨ 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. coerce. [LDF 2005.08.18.]

Log

[LDF 2005.08.18.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ COERCE_INDEX) {
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Coercing.");
    if (optarg) fprintf(stderr, "'optarg' == %s\n", optarg);
    else fprintf(stderr, "'optarg' == 0\n");
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  if (optarg ∧ ¬strcasecmp(optarg, "s")) {
#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 (optarg ∧ ¬strcasecmp(optarg, "l")) {
#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 (optarg) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "WARNING!  Invalid argument for the '--coerce' option:  %s\nW\
        ill coerce to 640x480 pixels.\n", optarg);
    pthread_mutex_unlock(&stdio_mutex);
    coerce_value = 2;
  }
  else {
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "`optarg' == 0.  " ≪ "Coercing to 640x480 pixels" ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  coerce_value = 2; } }      /* if (option_index ≡ COERCE_INDEX) */
```

19. end. [LDF 2005.08.19.]

Log

[LDF 2005.08.19.] Added this section.
[LDF 2005.09.02.] Now setting *force_switch* = *true*.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ END_INDEX) { sscanf(optarg, "%d", &end_value);
  force_switch = true;
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Setting␣end_value␣to␣%d.\n", end_value);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }     /* if (option_index ≡ END_INDEX) */
```

20. fill. [LDF 2005.08.22.]

Log

[LDF 2005.08.22.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ FILL_INDEX) { sprintf(fill_string, "-fill␣\"%s\"", optarg);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Setting␣‘fill_string’␣to␣%s.\n", fill_string);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }     /* if (option_index ≡ FILL_INDEX) */
```

21. force. [LDF 2005.09.02.]

Log

[LDF 2005.09.02.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ FORCE_INDEX) { force_switch = true;
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Setting␣‘force_switch’␣to␣" ≪ force_switch ≪ "." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }     /* if (option_index ≡ FORCE_INDEX) */
```

22. gray-negate. [LDF 2005.09.01.]

Log

[LDF 2005.09.01.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ GRAY_NEGATE_INDEX) { strcpy(negate_string, "+negate");
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Setting␣‘negate_string’␣to␣%s.\n", negate_string);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }     /* if (option_index ≡ GRAY_NEGATE_INDEX) */
```

23. height. [LDF 2005.08.18.]

Log

[LDF 2005.08.18.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ HEIGHT_INDEX) { sscanf(optarg, "%d", &height_value);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Setting␣height␣to␣%d␣pixels.\n", height_value);
    pthread_mutex_unlock(&stdio_mutex);
  }
#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, "conveps.\nCopyright␣(C)␣2009␣The␣Free␣Software␣Foundation\n");
      pthread_mutex_unlock(&stdio_mutex);
      exit(0);
    }     /* if (option_index ≡ HELP_INDEX) */
```

25. Horizontal Border. [LDF 2005.08.19.]

Log

[LDF 2005.08.19.] Added this section.

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

26. landscape. [LDF 2005.09.01.]

Log

[LDF 2005.09.01.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else
    if (option_index ≡ LANDSCAPE_INDEX) {
      portrait_or_landscape = LANDSCAPE;
    }     /* if (option_index ≡ LANDSCAPE_INDEX) */
```

27. negate. [LDF 2005.09.01.]

Log

[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.\n", negate_string);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }     /* if (option_index ≡ NEGATE_INDEX) */
```

28. new-filename. [LDF 2005.08.26.]

Log

[LDF 2005.08.26.] Added this section.

```
⟨ 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);
    fprintf(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.]

Log

[LDF 2005.08.22.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ NO_ZEROES_INDEX) { zeroes = 0;
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(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.]

Log

[LDF 2005.08.22.] Added this section.

```
⟨ 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);
    fprintf(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 2005.08.19.]

Log

[LDF 2005.08.19.] Added this section.
[LDF 2005.12.17.] BUG FIX: Now setting $*default_output$ %= 2 in the case that *optarg* is `"pnm"`.

```
⟨ Process command line options 15 ⟩ +≡
  else
    if (option_index ≡ OUTPUT_FORMAT_INDEX) {
      if (¬strcasecmp(optarg, "eps")) {
        eps_output = 1;
        *default_output %= 2;
      }
      else if (¬strcasecmp(optarg, "jpeg") ∨ ¬strcasecmp(optarg, "jpg")) {
        jpeg_output = 1;
        *default_output %= 2;
      }
      else if (¬strcasecmp(optarg, "png")) {
        png_output = 1;
        *default_output %= 2;
      }
      else if (¬strcasecmp(optarg, "pnm")) {
        pnm_output = 1;
        *default_output %= 2;
      }
      else if (¬strcasecmp(optarg, "ps")) {
        ps_output = 1;
        *default_output %= 2;
      }
      else {
        pthread_mutex_lock(&stdio_mutex);
        fprintf(stderr, "WARNING!␣␣Invalid␣'-output-format'␣argument:%s\nIgnoring.\n", optarg);
        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 ≡ QUIET_INDEX) {
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Will␣run␣quietly.\n");
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  VERBOSITY = QUIET; }
```

34. renumber. [LDF 2005.08.26.]

Log

[LDF 2005.08.26.] Added this section.
[LDF 2005.10.30.] BUG FIX: Now decrementing *renumber_value*.n

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

35. silent.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ SILENT_INDEX) {
#if DEBUG_COMPILE
  if (DEBUG) {
    if (DEBUG) {
      pthread_mutex_lock(&stdio_mutex);
      fprintf(stderr, "Will␣run␣silently.\n");
      pthread_mutex_unlock(&stdio_mutex);
    }
  }
#endif      /* DEBUG_COMPILE */
  VERBOSITY = SILENT; }
```

36. start. [LDF 2005.08.19.]

Log

[LDF 2005.08.19.] Added this section.

```
⟨ 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);
    fprintf(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.]

Log

[LDF 2005.08.27.] Added this section.

```
⟨ 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);
    fprintf(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.]

Log

[LDF 2005.08.22.] Added this section.

```
⟨ 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);
    fprintf(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.

```
⟨ Process command line options 15 ⟩ +≡
  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.

```
⟨ Process command line options 15 ⟩ +≡
  else
    if (option_index ≡ VERSION_INDEX) {
      pthread_mutex_lock(&stdio_mutex);
      fprintf(stderr, "conveps␣1.2.0\n");
      pthread_mutex_unlock(&stdio_mutex);
      exit(0);
    }
```

41. Vertical Border. [LDF 2005.08.18.]

Log

[LDF 2005.08.19.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ VERTICAL_BORDER_INDEX) {
  if (optarg) strcpy(vertical_border_string, optarg);
  else sprintf(vertical_border_string, "%d", DEFAULT_BORDER_VALUE);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Setting␣vertical␣border_string␣to␣%s.\n", vertical_border_string);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }     /* if (option_index ≡ VERTICAL_BORDER_INDEX) */
```

42. width. [LDF 2005.08.18.]

Log

[LDF 2005.08.18.] Added this section.

```
⟨ 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␣width␣to␣%d␣pixels.\n", width_value);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }     /* if (option_index ≡ WIDTH_INDEX) */
```

43. zeroes. [LDF 2005.08.22.]

Log

[LDF 2005.08.22.] Added this section.

```
⟨ Process command line options 15 ⟩ +≡
  else if (option_index ≡ ZEROES_INDEX) { sscanf(optarg, "%d", &zeroes);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Setting␣‘zeroes’␣to␣%d.\n", zeroes);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }     /* if (option_index ≡ ZEROES_INDEX) */
```

44. Invalid *option_index* value.

```
⟨ Process command line options 15 ⟩ +≡
  else {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "ERROR!␣␣In␣‘main()’:\n‘option_index’␣has␣invalid␣value:␣%d\\
        nWill␣try␣to␣continue.\n", option_index);
    pthread_mutex_unlock(&stdio_mutex);
  }
  }     /* if (option_ctr ≡ 0) */
```

45. Ambiguous option.

```
⟨ Process command line options 15 ⟩ +≡
  else
    if (option_ctr ≡ '?') {
      pthread_mutex_lock(&stdio_mutex);
      cerr ≪ "ERROR!␣␣In␣`main()':␣␣`getopt_long()'␣returned␣" ≪
          "ambiguous␣match.␣Breaking." ≪ endl;
      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.\n");
    pthread_mutex_unlock(&stdio_mutex);
  }
```

47. End of while loop.

```
⟨ Process command line options 15 ⟩ +≡
  }     /* while */
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "In␣`main()':␣␣End␣of␣command␣line␣processing.\n");
    pthread_mutex_unlock(&stdio_mutex);
  }
```

48. Process filenames. [LDF 2005.08.18.]

Log

[LDF 2005.08.18.] Added this section.

```
⟨ Process filenames 48 ⟩ ≡
  Unsigned_Byte arg_ctr = optind;
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "arg_ctr␣==␣%d\nargc␣==␣%d\n", arg_ctr, argc);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  if (argc − arg_ctr < 1) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "ERROR!␣␣In␣`main()':␣␣Not␣enough␣arguments.\nExiting␣`conve\
        ps'␣with␣return␣value␣1.\n");
    pthread_mutex_unlock(&stdio_mutex);
    return 1;
  }     /* if */
  if (argc − arg_ctr ≥ 1) strcpy(filename_stem, argv[arg_ctr]);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "filename_stem␣==␣%s\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:␣␣arg_ctr␣==␣%d\n", arg_ctr);
    fprintf(stderr, "Before␣start␣value␣arg:␣␣start_value␣==␣%d\n", start_value);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  if (argc − arg_ctr ≥ 1 ∧ start_value ≠ −1) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "WARNING:␣␣`start_value'␣already␣set␣using␣an␣optional␣argum\
        ent.\n`start_value'␣==␣%d.␣␣Not␣resetting␣to␣%s\n", start_value, argv[arg_ctr]);
    pthread_mutex_unlock(&stdio_mutex);
  }
  else if (argc − arg_ctr ≥ 1 ∧ start_value ≡ −1) sscanf(argv[arg_ctr], "%d", &start_value);
  else if (start_value ≡ −1) start_value = 0;
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "After␣start␣value␣arg:␣␣arg_ctr␣==␣%d\n", arg_ctr);
    fprintf(stderr, "After␣start␣value␣arg:␣␣start_value␣==␣%d\n", start_value);
    pthread_mutex_unlock(&stdio_mutex);
```

```
  }
#endif      /* DEBUG_COMPILE */
  ++arg_ctr;
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Before end value arg:  arg_ctr == %d\n", arg_ctr);
    fprintf(stderr, "Before end value 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 argumen\
        t.\n‘end_value’ == %d.  Not resetting to %s\n", end_value, argv[arg_ctr]);
    pthread_mutex_unlock(&stdio_mutex);
  }
```

See also section 49.

This code is used in section 54.

49.

Log

[LDF 2005.09.02.] Now setting *force_switch* = *true*.

```
  ********** **********
⟨ Process filenames 48 ⟩ +≡
  else
    if (argc − arg_ctr ≥ 1 ∧ end_value ≡ −1) {
      sscanf(argv[arg_ctr], "%d", &end_value);
      force_switch = true;
    }
    else if (end_value ≡ −1) end_value = DEFAULT_END_VALUE;
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "After end value arg:  arg_ctr == %d\n", arg_ctr);
    fprintf(stderr, "After end value arg:  end_value == %d\n", end_value);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  ++arg_ctr;
```

50. Main. [LDF 2005.04.21.]

⟨ Main 50 ⟩ ≡

```
int main(int argc, char **argv){ VERBOSITY = NORMAL;
    ⟨ Local variables for main( ) 12 ⟩
    ⟨ Declarations for command line options 14 ⟩
    pthread_mutex_init(&stdio_mutex, 0);
    strcpy(border_string, "");
    strcpy(horizontal_border_string, "");
    strcpy(vertical_border_string, "");
    sprintf(default_border_string, "%d", DEFAULT_BORDER_VALUE);
    strcpy(border_color_string, "");
    strcpy(default_border_color_string, "white");
    strcpy(fill_string, "");
    strcpy(opaque_string, "");
    strcpy(transparent_string, "");
    strcpy(new_filename_stem, "");
```

See also sections 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, and 62.

This code is used in section 81.

51.

Log

[LDF 2005.12.16.] 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 2005.12.17.] BUG FIX: Fixed the way I use the return value of *getenv*( ).

⟨ Main 50 ⟩ +≡

```
char *default_output_env_var;
default_output_env_var = getenv("CONVEPS_DEFAULT_OUTPUT_FORMAT");
if (¬default_output_env_var ∨ ¬strlen(default_output_env_var)) 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!␣␣In␣'main()':␣␣The␣environment␣variable␣" ≪
      "'CONVEPS_DEFAULT_OUTPUT_FORMAT'" ≪ endl ≪ "has␣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 ⟩ +≡
  if (VERBOSITY ≥ NORMAL) {
    cerr ≪ "converps␣Version␣1.2.0" ≪ endl ≪ "converps␣is␣part␣of␣GNU␣3DLDF␣Version␣1.2.0" ≪
        endl ≪ "Copyright␣(C)␣2009␣The␣Free␣Software␣Foundation" ≪
        endl ≪ "Author:␣␣Laurence␣D.␣Finston" ≪ endl ≪
        "converps␣and␣GNU␣3DLDF␣come␣with␣ABSOLUTELY␣NO␣WARRANTY;" ≪ endl ≪
        "for␣details␣see␣the␣file␣COPYING," ≪ endl ≪ "which␣you␣should␣have␣received" ≪
        endl ≪ "in␣the␣distribution␣of␣GNU␣3DLDF␣1.2.0." ≪ 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 ≪ endl ≪
        "Please␣send␣bug␣reports␣to␣Laurence.Finston@gmx.de" ≪ endl ≪
        "Web␣site:␣␣http://www.gnu.org/software/3dldf/LDF.html" ≪ endl ≪ endl;
  }     /* if (VERBOSITY ≥ NORMAL) */
```

53. Set tex_file_header. [LDF 2005.09.01.]

Log

[LDF 2005.09.01.] Added this section.

```
⟨ Main 50 ⟩ +≡
  {     /* Beginning of group. */
    stringstream tex_stringstream;
    tex_stringstream ≪ "\\batchmode\\input␣epsf" ≪ endl ≪ "\\def\\epsfsize#1#2{#1}" ≪ endl ≪
        "\\nopagenumbers" ≪ endl ≪ "\\parindent=0pt" ≪ endl;
#if 0     /* 1 */
    if (portrait_or_landscape ≡ LANDSCAPE) tex_stringstream ≪ "\\hsize=420mm" ≪ endl ≪
        "\\vsize=297mm" ≪ endl ≪ "\\special{papersize=420mm,␣297mm}" ≪ endl;
    else      /* (portrait_or_landscape ≡ PORTRAIT) */
      tex_stringstream ≪ "\\hsize=297mm" ≪ endl ≪ "\\vsize=420mm" ≪ endl;
#endif
    tex_stringstream ≪ "\\advance\\voffset␣by␣-1in" ≪ endl ≪ "\\advance\\hoffset␣by␣-1in" ≪
        endl;
    strcpy(tex_file_header, tex_stringstream.str( ).c_str( ));
  }     /* End of group. */
```

54.

```
⟨ Main 50 ⟩ +≡
  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);
    sprintf(border_string, "-border␣%sx%s␣-bordercolor␣%s", horizontal_border_string,
        vertical_border_string, border_color_string);
  }
  if (¬(eps_output ∨ jpeg_output ∨ png_output ∨ pnm_output ∨ ps_output)) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "ERROR!␣␣Command␣line␣arguments␣suppress␣all␣output.\nExitin\
        g␣‘conveps’␣with␣return␣value␣1.\n");
    pthread_mutex_unlock(&stdio_mutex);
    return 1;
  }
  ⟨ Process filenames 48 ⟩
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "‘filename_stem’:␣%s\n", filename_stem);
    fprintf(stderr, "‘start_value’:␣%d\n", start_value);
    fprintf(stderr, "‘end_value’:␣%d\n", end_value);
    if (strlen(horizontal_border_string))
      fprintf(stderr, "‘horizontal_border_string’:␣%s\n", horizontal_border_string);
    else fprintf(stderr, "‘horizontal_border_string’␣is␣empty.\n");
    if (strlen(vertical_border_string))
      fprintf(stderr, "‘vertical_border_string’:␣%s\n", vertical_border_string);
    else fprintf(stderr, "‘vertical_border_string’␣is␣empty.\n");
    if (strlen(border_string)) fprintf(stderr, "‘border_string’:␣%s\n", border_string);
    else fprintf(stderr, "‘border_string’␣is␣empty.\n");
    if (eps_output) fprintf(stderr, "Producing␣EPS␣output.\n");
    else fprintf(stderr, "Not␣producing␣EPS␣output.\n");
    if (jpeg_output) fprintf(stderr, "Producing␣JPEG␣output.\n");
    else fprintf(stderr, "Not␣producing␣JPEG␣output.\n");
    if (png_output) fprintf(stderr, "Producing␣PNG␣output.\n");
    else fprintf(stderr, "Not␣producing␣PNG␣output.\n");
    if (pnm_output) fprintf(stderr, "Producing␣PNM␣output.\n");
    else fprintf(stderr, "Not␣producing␣PNM␣output.\n");
    if (ps_output) fprintf(stderr, "Producing␣PS␣output.\n");
    else fprintf(stderr, "Not␣producing␣PS␣output.\n");
    pthread_mutex_unlock(&stdio_mutex);
  }     /* if (DEBUG) */
#endif      /* DEBUG_COMPILE */
```

55. Write code for including EPS files to *tex_file*. [LDF 2005.04.22.]

Log

[LDF 2005.04.22.] BUG FIX: Now checking to see if *temp_file* exists. If it doesn't, **break** is called.
[LDF 2005.04.22.] Now running TEX and `dvips` on individual files. There were problems using the `-i` and `-S` options to `dvips`.

⟨ Main 50 ⟩ +≡
```
int i;
float width;
float height;
```

56. Set *zeroes*. [LDF 2005.08.22.] o

Log

[LDF 2005.08.22.] Added this section.

To Do

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

```
⟨ Main 50 ⟩ +≡
  if (zeroes ≡ 0) zeroes_string[0] = '\0';
  else if ((end_value + renumber_value) > 10000) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "ERROR!␣␣(‘end_value’␣+␣‘renumber_value’)␣==␣%d␣>␣10,000.\nC\
        an’t␣handle␣this␣case␣yet.\nExiting␣‘conveps’␣with␣return␣value␣1.\n",
        end_value + renumber_value);
    pthread_mutex_unlock(&stdio_mutex);
    return 1;
  }     /* if (end_value > 10000) */
  else if ((end_value + renumber_value) ≥ 1000 ∧ zeroes ≤ 4) {
    zeroes = 4;
  }
  else if ((end_value + renumber_value) ≥ 100 ∧ zeroes ≤ 3) {
    zeroes = 3;
  }
  else if ((end_value + renumber_value) ≥ 10 ∧ zeroes ≤ 2) {
    zeroes = 2;
  }
  else if (zeroes < 0) {
    zeroes = DEFAULT_ZEROES;
  }
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "zeroes␣==␣" ≪ zeroes ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  {
    int i;
    for (i = 0; i < zeroes; ++i) zeroes_string[i] = '0';
    zeroes_string[i] = '\0';
  }
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "zeroes_string␣==␣" ≪ zeroes_string ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
```

57.

Log

[LDF 2005.08.22.] Now continuing if $i \equiv 0$ and *filename_stem*.0 doesn't exist. [LDF 2005.08.22.]

```
⟨ Main 50 ⟩ +≡
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "start_value␣==␣%d,␣end_value␣==␣%d,␣renumber_value␣==␣%d\n", start_value,
        end_value, renumber_value);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  int thread_ctr = 0;
  char temp_eps_file_name[MAX_FILENAME];
  FILE *temp_eps_file;
```

58.

Log

[LDF 2005.08.27.] Added code for limiting the number of threads that can be active at one time. This is controlled by the global variable **unsigned short** *threads_limit*, whose default value is **const unsigned short** DEFAULT_THREADS_LIMIT = 100. It can be reset by the command-line option `--threads-limit`.

```
⟨ 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) {
```

59.

```
⟨ Main 50 ⟩ +≡
  if (i > end_value) break;
  sprintf(temp_eps_file_name, "%s.%d", filename_stem, i);
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "‘temp_eps_file_name’␣==␣" ≪ "‘" ≪ temp_eps_file_name ≪ "’." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
  temp_eps_file = fopen(temp_eps_file_name, "r");
```

60.

Log

[LDF 2005.09.02.] Now continuing if *force_switch* ≡ *true*.

```
⟨ Main 50 ⟩ +≡
  if (temp_eps_file ≡ 0 ∧ (force_switch ∨ i ≡ 0)) {
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ filename_stem ≪ "." ≪ i ≪ "doesn't␣exist.␣␣Continuing." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif     /* DEBUG_COMPILE */
  continue; }
```

61.

Log

[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.␣␣" ≪
          "Won't␣create␣any␣more␣threads." ≪ endl;
      pthread_mutex_unlock(&stdio_mutex);
      i = end_value + 1;
      break;
    }
    else fclose(temp_eps_file);
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "About␣to␣create␣thread." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#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_COMPILE
  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()':\n" ≪ "`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_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "After␣creating␣thread." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
```

```
  }
#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 ⟩ +≡

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

63.

⟨ Declare thread function 63 ⟩ ≡

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

This code is used in section 81.

64.

⟨ Define thread function 64 ⟩ ≡

```
  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;
```

See also sections 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 76, and 77.

This code is used in section 81.

65.

Log

Added the variables **int** *width_pixels*, **int** *height_pixels*, **float** *width_cm*, **float** *height_cm*.

```
⟨ Define thread function 64 ⟩ +≡
  FILE *tex_file;
  FILE *dvi_file;
  FILE *eps_file;
  FILE *ps_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];
  int width_pixels = 0;
  int height_pixels = 0;
  float width_cm = 0;
  float height_cm = 0;
```

66.

```
⟨ Define thread function 64 ⟩ +≡
#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 */
```

67. Set *arg_ptr→zeroes_string*.

Log

[LDF 2005.08.22.] Added this section.

```
⟨ Define thread function 64 ⟩ +≡
  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:␣␣arg_ptr->zeroes_string␣␣==␣" ≪
        arg_ptr→zeroes_string ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif    /* DEBUG_COMPILE */
  arg_ptr→zeroes_string[temp_ctr] = '\0';
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "After:␣␣arg_ptr->zeroes_string␣␣==␣" ≪ arg_ptr→zeroes_string ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif    /* DEBUG_COMPILE */
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣`arg_ptr->zeroes_string'␣==␣" ≪ arg_ptr→zeroes_string ≪
        "." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif    /* DEBUG_COMPILE */
```

68.

Log

[2009.01.14.] Changed the TEX code written to the output file. The argument `-crop 0x0` to `mogrify` no longer works. It wasn't documented, so this program was apparently depending on unintended behavior of the `mogrify` program. It did provide a simple way of cropping empty parts of an image surrounding the desired parts.

```
⟨ Define thread function 64 ⟩ +≡
  sprintf(eps_file_name, "%s.%d", filename_stem, i);
  sprintf(tex_file_name, "%s_%s%d.tex", out_filename_stem, arg_ptr→zeroes_string, (i + renumber_value));
  sprintf(dvi_file_name, "%s_%s%d.dvi", out_filename_stem, arg_ptr→zeroes_string, (i + renumber_value));
  sprintf(log_file_name, "%s_%s%d.log", out_filename_stem, arg_ptr→zeroes_string, (i + renumber_value));
  sprintf(ps_file_name, "%s_%s%d.ps", out_filename_stem, arg_ptr→zeroes_string, (i + renumber_value));
  sprintf(pnm_file_name, "%s_%s%d.pnm", out_filename_stem, arg_ptr→zeroes_string, (i + renumber_value));
  tex_file = fopen(tex_file_name, "w");
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Thread␣%d:␣␣‘eps_file_name’␣==␣%s\n", thread_ctr, eps_file_name);
    fprintf(stderr, "Thread␣%d:␣␣‘tex_file_name’␣==␣%s\n", thread_ctr, tex_file_name);
    fprintf(stderr, "Thread␣%d:␣␣‘dvi_file_name’␣==␣%s\n", thread_ctr, dvi_file_name);
    fprintf(stderr, "Thread␣%d:␣␣‘log_file_name’␣==␣%s\n", thread_ctr, log_file_name);
    fprintf(stderr, "Thread␣%d:␣␣‘ps_file_name’␣==␣%s\n", thread_ctr, ps_file_name);
    fprintf(stderr, "Thread␣%d:␣␣‘pnm_file_name’␣==␣%s\n", thread_ctr, pnm_file_name);
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif    /* DEBUG_COMPILE */
```

69.

Log

[LDF 2009.11.02.] !! TODO: Change so that `identify` isn't used for finding the size of the image. I'm getting an error when TEX/ fonts are used. Put the image into a box instead and measure the box. The problem can be avoided by setting `prologues` to 3 in the METAPOST file (possibly by means of `verbatim_metapost` in the 3DLDF input file).x

```
⟨ Define thread function 64 ⟩ +≡
  strcpy(system_string, "identify␣");
  strcat(system_string, eps_file_name);
  FILE *fp = popen(system_string, "r");
    /* This is the output of 'identify 3DLDFmp.1' when the image contains a square one square cm in
      area: 3DLDFmp.1 PS 29x29 29x29+0+0 PseudoClass 256c 16-bit 906b LDF 2009.01.14. */
  fscanf(fp, "%*s␣%*s␣%dx%d", &width_pixels, &height_pixels);
  pclose(fp);
  fp = 0;
  width_cm = width_pixels/29.0;
  height_cm = height_pixels/29.0;
  strcpy(system_string, "");
  fprintf(tex_file,
      "%s\n\\setbox0=\\vbox{\\hbox{\\epsffile{%s}\\hskip5pt}\\vskip5pt}\n\\vsize=\\ht0\
      \n\\hsize=\\wd0\n\\special{papersize=%.3fcm,␣%.3fcm}\n\n\\box0\n\\bye\n",
      tex_file_header, eps_file_name, width_cm, height_cm);
  fclose(tex_file);
  sprintf(system_string, "tex␣%s␣>␣/dev/null", tex_file_name);
  if (VERBOSITY ≥ VERBOSE) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Thread␣%d:␣␣Executing␣`%s'.\n", thread_ctr, system_string);
    pthread_mutex_unlock(&stdio_mutex);
  }
  do {
    status = system(system_string);
    if (status ≠ 0) {
      pthread_mutex_lock(&stdio_mutex);
      cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣ERROR!␣␣In␣`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 (VERBOSITY ≥ VERBOSE) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣`" ≪ system_string ≪ "'␣returned␣" ≪ status ≪ "." ≪
        endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
```

70.

Log

[LDF 2005.04.25.] Now calling *remove*( ) rather than using "`rm`" in a call to *system*( ).

[LDF 2005.08.31.] Now using "`rm -f`" in a call to *system*( ) rather than calling *remove*( ). Removed the loop that tried to remove the PostScript file, and went to sleep upon failure.

```
⟨ Define thread function 64 ⟩ +≡
  sprintf(system_string, "rm␣-f␣%s", ps_file_name);
  if (VERBOSITY ≥ VERBOSE) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣Executing␣`" ≪ system_string ≪ "'." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
  status = system(system_string);
  if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣WARNING!␣␣In␣`thread_func':\n" ≪
        "Failed␣to␣delete␣`" ≪ ps_file_name ≪ "'." ≪ "␣␣Continuing." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }     /* if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) */
  sprintf(system_string, "dvips␣-q␣-o␣%s␣%s", ps_file_name, dvi_file_name);
  if (VERBOSITY ≥ VERBOSE) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Thread␣%d:␣␣Executing␣`%s'.\n", thread_ctr, system_string);
    pthread_mutex_unlock(&stdio_mutex);
  }
  do {
    status = system(system_string);
    if (status ≠ 0) {
      pthread_mutex_lock(&stdio_mutex);
      cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣ERROR!␣␣In␣`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␣" ≪ thread_ctr ≪ ":␣␣`" ≪ system_string ≪ "'␣returned␣" ≪ status ≪ "." ≪
        endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif     /* DEBUG_COMPILE */
```

71.

Log

[LDF 2005.09.02.] Added this section.
[LDF 2005.09.02.] BUG FIX: Added `+antialias` option.
[2009.01.14.] Now using *width_pixels* and *height_pixels* in the argument to the `-crop` option. For some reason, I'm losing a pixel in each dimension. ?? Find out why.

⟨ Define thread function 64 ⟩ +≡

```
sprintf(system_string, "mogrify␣+antialias␣-crop␣%dx%d␣%s", width_pixels, height_pixels, ps_file_name);
if (VERBOSITY ≥ NORMAL) {
  pthread_mutex_lock(&stdio_mutex);
  cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣Executing␣`" ≪ system_string ≪ "'." ≪ endl;
  pthread_mutex_unlock(&stdio_mutex);
}
status = system(system_string);
```

72.

Log

[LDF 2005.09.01.] 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.
[LDF 2005.09.02.] BUG FIX: Added `+antialias` option.
[2009.01.14.] Commented-out this code.

⟨ Define thread function 64 ⟩ +≡

```
#if 0    /* 1 */
  if (portrait_or_landscape ≡ LANDSCAPE) {
    sprintf(system_string, "mogrify␣+antialias␣-rotate␣-90␣%s", ps_file_name);
    if (VERBOSITY ≥ NORMAL) {
      pthread_mutex_lock(&stdio_mutex);
      cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣Executing␣`" ≪ system_string ≪ "'." ≪ endl;
      pthread_mutex_unlock(&stdio_mutex);
    }
    status = system(system_string);
  }    /* if (portrait_or_landscape ≡ LANDSCAPE) */
#endif
  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␣%d:␣␣ERROR!␣␣In␣`main()':␣␣Invalid␣value␣for␣`coerce\
        _value':␣␣%d\nSetting␣`coerce_string'␣to␣\"\"␣and␣continuing.\n", thread_ctr,
        coerce_value);
    pthread_mutex_unlock(&stdio_mutex);
    strcpy(coerce_string, "");
  }
```

73.

Log

[LDF 2005.10.30.] BUG FIX: No longer including *border_color_string* in *system_string*. It's already included in *border_string*.

```
⟨ Define thread function 64 ⟩ +≡
  if (strlen(coerce_string) ∨ strlen(opaque_string) ∨ strlen(border_string) ∨ strlen(negate_string)) {
      sprintf(system_string, "mogrify␣+antialias␣%s␣%s␣%s␣%s␣%s␣%s", border_string, fill_string,
      opaque_string, coerce_string, negate_string, ps_file_name);
  if (VERBOSITY ≥ NORMAL) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣Executing␣`" ≪ system_string ≪ "'." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
  do {
    status = system(system_string);
    if (status ≠ 0) {
      pthread_mutex_lock(&stdio_mutex);
      cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣ERROR!␣␣In␣`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␣" ≪ thread_ctr ≪ ":␣␣`" ≪ system_string ≪ "'␣returned␣" ≪ status ≪ "." ≪
        endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  }      /* if (strlen(coerce_string) ∨ strlen(opaque_string) ∨ strlen(border_string)) */
```

74.

Log

[LDF 2005.04.25.] Now calling *remove*( ) rather than using "`rm`" in calls to *system*( ).
[LDF 2005.05.08.] Commented-out the code that converts the EPS files to PNG.
[LDF 2005.08.31.] 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.

To Do

TO DO: Change the way the return value of *system* is checked elsewhere. I've fixed it here.

```
⟨ Define thread function 64 ⟩ +≡
  if (eps_output) {
    strcpy(output_extension, "eps");
    ⟨ Convert PS file 75 ⟩
  }
  if (jpeg_output) {
    strcpy(output_extension, "jpg");
    ⟨ Convert PS file 75 ⟩
  }
  if (pnm_output) {
    strcpy(output_extension, "pnm");
    ⟨ Convert PS file 75 ⟩
  }
  if (png_output) {
    strcpy(output_extension, "png");
    ⟨ Convert PS file 75 ⟩
  }
  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);
  }
  sprintf(system_string, "rm␣-f␣%s", tex_file_name);
  status = system(system_string);
  if ((¬WIFEXITED(status) ∨ WEXITSTATUS(status) ∨ status) ∧ VERBOSITY ≥ NORMAL) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣WARNING!␣␣In␣‘thread_func()’:" ≪ endl ≪
        "Failed␣to␣delete␣‘" ≪ tex_file_name ≪ "’.␣␣Continuing." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }     /* if (¬WIFEXITED(status) ∨ WEXITSTATUS(status) ∨ status) */
  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);
  }
  sprintf(system_string, "rm␣-f␣%s", dvi_file_name);
  status = system(system_string);
  if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) {
    pthread_mutex_lock(&stdio_mutex);
```

```
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣WARNING!␣␣In␣‘thread_func’:" ≪ endl ≪
        "Failed␣to␣delete␣‘" ≪ dvi_file_name ≪ "’.␣␣Continuing." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }     /* if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) */
```

75.

```
⟨ Convert PS file 75 ⟩ ≡
  sprintf(system_string, "convert␣+antialias␣%s␣%s␣%s␣%s_%s%d.%s", transparent_string, coerce_string,
      ps_file_name, out_filename_stem, arg_ptr→zeroes_string, (i + renumber_value), output_extension);
  if (VERBOSITY ≥ NORMAL) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Thread␣%d:␣␣Executing␣‘%s’.\n", thread_ctr, system_string);
    pthread_mutex_unlock(&stdio_mutex);
  }
  do {
    status = system(system_string);
    if (status ≠ 0) {
      pthread_mutex_lock(&stdio_mutex);
      cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣ERROR!␣␣In␣‘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␣" ≪ thread_ctr ≪ ":␣␣‘" ≪ system_string ≪ "’␣returned␣" ≪ status ≪ "." ≪
        endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
```

This code is used in section 74.

76. PS file. Don't delete if *ps_output* $\neq 0$. [LDF 2005.08.19.]

Log

[LDF 2005.08.31.] Removed the loops that tried to remove files and put the thread to sleep upon failure.

```
⟨ Define thread function 64 ⟩ +≡
  if (¬ps_output) {
    if (VERBOSITY ≥ VERBOSE) {
      pthread_mutex_lock(&stdio_mutex);
      fprintf(stderr, "Thread␣%d:␣␣Removing␣%s\n", thread_ctr, ps_file_name);
      pthread_mutex_unlock(&stdio_mutex);
    }
    status = remove(ps_file_name);
    if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) {
      pthread_mutex_lock(&stdio_mutex);
      cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣WARNING:␣␣Failed␣to␣remove␣" ≪ ps_file_name ≪
          ".␣␣Continuing." ≪ endl;
      pthread_mutex_unlock(&stdio_mutex);
    }     /* if (status ≠ 0) */
  }     /* if (¬ps_output) */
#if DEBUG_COMPILE
  else
    if (DEBUG) {
      pthread_mutex_lock(&stdio_mutex);
      cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣Not␣removing␣" ≪ ps_file_name ≪ "." ≪ endl;
      pthread_mutex_unlock(&stdio_mutex);
    }
#endif      /* DEBUG_COMPILE */
```

77.

```
⟨ Define thread function 64 ⟩ +≡
  if (VERBOSITY ≥ VERBOSE) {
    pthread_mutex_lock(&stdio_mutex);
    fprintf(stderr, "Thread␣%d:␣␣Removing␣%s\n", thread_ctr, log_file_name);
    pthread_mutex_unlock(&stdio_mutex);
  }
  status = remove(log_file_name);
  if (status ≠ 0 ∧ VERBOSITY ≥ NORMAL) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣WARNING:␣␣Failed␣to␣remove␣" ≪ log_file_name ≪
        ".␣␣Continuing." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#if DEBUG_COMPILE
  if (DEBUG) {
    pthread_mutex_lock(&stdio_mutex);
    cerr ≪ "Thread␣" ≪ thread_ctr ≪ ":␣␣Exiting␣'thread_func()'␣successfully\
        ␣with␣return␣value␣0." ≪ endl;
    pthread_mutex_unlock(&stdio_mutex);
  }
#endif      /* DEBUG_COMPILE */
  delete arg_ptr;
  arg_ptr = 0;
  return 0; }      /* End of thread_func( ) definition. */
```

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This code is cited in section 2.

This code is used in section 81.

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conveps
Version 1.2.0
by Laurence D. Finston

December 2005

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