Manual for LaTeXdraw version C15.04 and later

(Siegert, 17.08.1996) 1st raw translation

This version is upward compatible with all older versions. Since version 14.04 a digitizer tablet can be connected. The description of this tablet is not included.

1 Environment

1.1 Style files

LaTeXdraw uses UNIX and X-Windows. For translating a LaTeX-source document with pictures the style file latexdraw.sty must be included. This style file uses the package pstricks.tex (a standard package for LaTeX). For printing and previewing the DVI-file generated by latex or slitex is not suitable. You must translate the DVI-file to a Postscript-file by the program dvips.

Example:
Assuming a LaTeX-document with the file name myfile.tex, the following commands do the job:
latex myfile.tex
dvips myfile.dvi
The headline of myfile.tex could be
\documentstyle[latexdraw]{article}

1.2 Fonts

The fonts used by LaTeXdraw in its output file are 6, 8, 10, 12, 14, and 18 point Roman fonts in normal, bold and italics. If no font is defined, the font defined in the environment of the picture is used. All fonts can be redefined either in latexdraw.sty or later in the LaTeX-document.

Fonts used for the screen display are (∗ is wild card):
-∗-times-medium-r-∗-∗-8-∗
-∗-times-medium-r-∗-∗-10-∗
-∗-times-medium-r-∗-∗-14-∗
-∗-times-medium-r-∗-∗-17-∗
-∗-times-medium-r-∗-∗-20-∗
-∗-times-medium-r-∗-∗-24-∗
-∗-times-bold-r-∗-∗-8-∗

-*-times-bold-r-*-*-10-*
-*-times-bold-r-*-*-14-*
-*-times-bold-r-*-*-17-*
-*-times-bold-r-*-*-20-*
-*-times-bold-r-*-*-24-*
-*-times-medium-i-*-*-8-*
-*-times-medium-i-*-*-10-*
-*-times-medium-i-*-*-14-*
-*-times-medium-i-*-*-17-*
-*-times-medium-i-*-*-20-*
-*-times-medium-i-*-*-24-*
8x13
8x13bold

These fonts should be available in your system. If pathnames are not right, they can be modified by xset fp < comma separated list of pathnames >. If a font is not available LaTeXdraw uses a 8x13-font
-*-times-medium-r-*-*-17-*

2 User interface

2.1 Cursor

Three different shapes of the cursor are used:

- Keyboard input expected (square with point);
- Click with mouse button expected (arrow);
- LaTeXdraw is busy (heart).

2.2 Files

LaTeXdraw generates two different output files:

- the LaTeXdraw–file
  The LaTeXdraw-file saves the picture in an internal format. This file can be read and modified by LaTeXdraw again. Use it to save the final version of your picture and intermediate states.
- the LaTeX–file
  The LaTeX–file is the output file with the generated latex source code for the picture. When saving a picture you can choose one of two versions:
  - The file is a full latex document with all headers and trailers. It can be translated with latex and dvips immediately.

– The file is a latex document containing only the picture. It can be included in other latex-documents without changes, e.g. by
$\backslash input\{< filename >\}$

All files are ASCII-files and can easily be modified, if necessary.

2.3 LaTeXdraw-Window

The LaTeXdraw window allows fast drawing. Therefore all drawing options are always displayed and there are no pull down menues. The LaTeXdraw window consists of the following regions:

- A special menue for direct selection of colors and fonts;
- the menue with drawing options and basic drawing elements, also called objects;
- the prompt line showing the next action expected or the current keyboard input;
- the drawing area, with the picture
  The area can be scrolled with the arrow keys of the keyboard. The size can be changed by changing the size of the window. The initial size corresponds roughly to paper format A4.

2.4 Command options

All command options are optional. LaTeXdraw knows the following command options:

- -q or -l: the orientation of the drawing area is landscape (this does not influence the output files!)
- -t: If LaTeXdraw was generated with the digitizer option (see makefile) then the digitizer tablet is enabled
- The default header line used for the LaTeX-file is:
  ”\documentstyle[latexdraw]{article}”
- -2e sets the header line to:
  ”\documentclass{article} \input{latexdraw.sty}”
- -d followed by a string x sets the header line to x.
  Example:
  latexdraw -l -d ’\[latexdraw]{report}\pagestyle{empty}’

  sets orientation to landscape, uses the documentstyle report, and the pagestyle is empty.

- -f followed by a font name defines the font used for the menue, e.g. -f 8x13bold.
- The size of the drawing area can be adjusted by the user at any time by changing the size of the window. The command option -s followed by pixelwidthxpixelheight defines the initial size of the drawing area.
- -io myfile1 myfile2
  In this case LaTeXdraw is not started for drawing but only for file generation. The input file myfile1 is a LaTeXdraw–file. It is used to generate the output file myfile2, which is a LaTeX–file.

2.5 Mouse buttons

Usually you use the left mouse button to select a menue item, to click on a point or to define a selection rectangle by dragging. If you click on a menue item which represents a value, the left mouse button counts upwards and the right mouse button counts downwards.

If the menue item "snap" is active, the selected point in the drawing area is the nearest hot point of a drawing object or of the grid, if those are within a certain distance. If "mp" is active, the selected point is the middle point of the selected drawing object.

Often you want to draw horizontal or vertical lines, which do not follow grid lines. This is supported by the following mechanism. Suppose the point last selected is (xlast,ylast). Now you click on the point (x,y) and drag the mouse with button 1 pressed to the point (xe,ye). First the snap point (xsnap, ysnap) is calculated from (x,y). If $|x-xe| > |y-ye|$ then the point used for further processing is (xlast,ysnap) otherwise (xsnap,ylast).

2.6 Object groups

Drawing objects can be aggregated to groups of objects. Groups can be aggregated with other groups or drawing objects to higher level groups. Groups can be ungrouped later. Grouping information persists even if the grouping mode is inactive.

If the grouping mode is inactive then objects can be selected, deleted or modified without beeing influenced by the group structure.

If the grouping mode is active then the selection of objects is influenced by the group structure in the following way:

- If according to the context only the selection of a single object is reasonable, then the object you clicked on is selected, e.g. you select a line to draw a parallel line.
- If you click on an object e, then all objects are selected which belong to the same groups as e (highest level group and all subgroups). If e is not in a group, then e is selected.

- If you define a selection rectangle, then all objects are selected which are not part of a group, but are within the rectangle, and all objects of those groups where all objects of the highest level group are within the selection rectangle.

2.7 Selection of menue items

Menue items define drawing objects, options for objects and other operations. Active menue items are displayed in inverse color (black). If you click with button 1 you can activate and deactivate items. If a new activation gets in conflict with other activations, then the other items are deactivated. Items may be active even when they are without influence to the current drawing process.

It is always(!) possible to click on a menue item to change an option or to abort an operation or drawing process. Menue items which are options are used at the latest possible point in the drawing process.

2.8 Error messages

Error messages and file operations are displayed in the parent window.

3 Description of the menue items

1. Menue item 'quit'
   Quit the program. Input of the name of a file to save the current drawing is requested. If the file name is empty, the drawing is not saved.

2. Menue item 'load'
   Load a new picture. The name of a LaTeXdraw–inputfile is requested. If the file name is empty or the file not existent, then the drawing area is cleared.

3. 'save'
   Save the current picture. The name of a LaTeXdraw–outputfile is requested. If the suggested name is ok, then press return otherwise type name. If the file name is empty then no output is generated. The drawing process can proceed after saving. The output file can be loaded with 'load'.

   After writing the LaTeXdraw–outputfile the name of a LaTeX–file is requested. If the suggested name is ok, then press return otherwise type name. If the file name is empty then no output is generated. Otherwise output options are requested. If they are the same as last saved for this picture, just press return. If they differ, you are prompted for input:

   - Do you want the output file with or without header and trailer?
   - Maximum width and maximum height of picture in mm (for scaling)?
   - Orientation of picture (rotated 90 degrees or not)?

The current output options are also saved in the LaTeXdraw–file for later use.

Note:
Width and height are always defined for the picture before rotation! Width and height are used for calculating the LaTeX scaling factor '\unitlength'. Scaling is uniform in both dimensions. The scaling is calculated to fill one of the two dimensions with the picture. Linewidth and text fonts are never scaled in order to achieve quality and consistency with the surrounding document.

4. Menue item 'text'
   First a point, the reference point, is defined. Then text input with the keyboard is requested. This text is displayed in the prompt line and can be modified there. If there was already a text object at the selected point, the text of this object is displayed.

   The font used is indicated in the menue field next to the menue item 'text', e.g. 17bpt means bold 17 points. An empty field means use the font defined in the environment of the picture. You may change the font by selecting the font from the special menue or by clicking with the left or right mouse button in the font field next to 'text' before finishing text input.

   Text input is finished with return. Text can be no longer than about 110 characters.

   Modifying text is similiar to emacs; use the characters DELETE, BACKSPACE or ctrl-a, ctrl-d, ctrl-e and ctrl-k.

   The fonts used are defined with macros in latexdraw.sty and can be changed. The commands are defined as \F<fname>, where fname is the font name displayed in the menue with the arabic numbers transformed into roman numbers, e.g. font 12bpt is associated with command \FXIIbpt.

   The text is aligned relative to the reference point according to the menue options 'l, r, t, b' and their combinations. The reference point is indicated on the screen with a small triangle. The alignment is read when text input is finished with return. Meaning:

   - 'l': Text aligned left
   - 'r': Text aligned right
   - both 'l' and 'r' not active: Text width centered
   - 'b': Text bottom aligned
   - 't': Text top aligned
   - both 'b' and 't' not active: Text height centered

   If the menue item '||' is activated, then the text is rotated. The rotation is defined by selecting a reference line which is parallel to the text. Since X-Windows is unable to display rotated text, the text is always displayed horizontally. The rotation is indicated by a special line associated with the text. Since texts are character strings which are processed by the latex programm it is allowed to use all macros (commands) defined by the latex environment of the picture in your document.

5. Menue item 'line'
   Used to draw a line. Most lines are defined by their start and end point only. Options are '||', '|-', ' _ ', ' . ', 'b>', 'e>' and '—]'.

   '||' says that you want to draw a line which is parallel to some other line and has the same lenght.

   '|-' says that you want to draw a line which is normal to an other line.

   Solid lines are drawn when neither ' _ ' nor ' . ' are activated. If only ' _ ' (' . ') is active the lines are dashed (dotted). If both ' _ ' and ' . ' are activated then the lines are dashed dotted.

   'b>' ('e>') means arrow at the beginning (end) of a line. The beginning of a line is the first point you defined.

   If there are no arrows selected but '—]' then solid lines are extended half their linewidth on both ends.

   The linewidth is defined by an integer between 0 and 20. The value is displayed in the menue field '='. For printing the actual linewidth is calculated in latexdraw.sty.

6. Menue item 'circle'
   Used to draw a circle or a filled circle or a circular arc or a circular pieslice. A circle is defined by its center point and a point on the circle. For an arc the beginning and the end of the arc has to be defined (in mathematical sense).

   If menue item 'C' is active then an arc or pieslice is drawn.

   If menue item '∗' is active a filles circle or a pieslice is drawn.

   The menue items ' _ ' and ' . ' define the linetype for circles or circular arcs.

   The menue items 'b>' and 'e>' define possible arrows for arcs.

   Defining the beginning or end of an arc has an important definition which allows – in contrast to other drawing programs – easy and precise positioning in many important cases. Assume (xc,yc) is the center point and you have clicked on (x,y) to define the beginning or end of the arc. Then the arc starts (ends) at the intersection of the line defined by (xc,yc) to (x,y) and the circle.

   An other way to define arcs is the direct keyboard input of the arc as floating point number in degrees. This can be done when 'deg' is active.

   To select a circle or arc click on the circle or arc.

7. Menue item 'ellipse'
   It is used to draw an ellipse or afilled ellipse or an elliptical arc or a elliptical pieslice. For details see 'circle'. When you have to define the endpoints of the x-axis (y-axis) then only the x-value (y-value) of the selected point is used.

   Ellipses are rotation sensitive. If menue item '||' is active then the major axis of the ellipse is parallel to line to be selected.

8. Menue item 'rectangle'
   It is used to draw a rectangle or a filled rectangle if '∗' is active. To define the rectangle you have to define 2 diagonal corner points. A rectangle which is not filled is represented as four isolated lines.

To select a rectangle click on the lines. To select a filled rectangle click on a point within the rectangle.

9. Menue item 'triangle'
   It is used to draw a triangle, defined by three corner points. If '$*$' is active then the triangle is filled.

   A triangle which is not filled is represented as three isolated lines.

   To select a triangle click on one of the lines. To select a filled triangle click on a point within the triangle.

10. Menue item 'quadrangle'
    It is used to draw a quadrangle defined by four corner points in sequence. If '$*$' is active then the quadrangle is filled.

    A quadrangle which is not filled is represented as four isolated lines.

    To select a quadrangle click on one of the lines. To select a filled quadrangle click on a point within the quadrangle.

11. Menue item 'Bezier'
    It is used to draw a Bezier curve of third order, defined by 4 points. Linetype and arrows as described under 'line'. If '$*$' is active then the curve is filled.

    The first point is the starting point of the Bezier curve. The second point defines the tangent to the starting point. The fourth point is the endpoint of the curve. The third point defines the tangent to the end point.

    A new Bezier curve which has the end point of the previous Bezier curve as starting point and the same tangent there can be defined by additional input of 2 points which define the tangent to the endpoint and the endpoint.

12. Menue item 'polygon'
    It is used to draw a regular polygon. First point is the center point, the second point is a point on the circle. The number of vertices is requested as a keyboard input. This input is finished by 'RETURN'. If the menue field '$*$' is active, then all vertices are connected by a line with the center point.

13. Menue item 'connect'
    The center points of two drawing objects are connected. The center points are dependeing of the type of the drawing object, e.g. for filled trinangles the center of gravity is used as center point.

    If menue field 'p' is active then the second point is not defined by a drawing object but is the click-point itsself.

    Is neither 'X' nor 'Y' active, then the two point are connected by a direct line. If 'X' is active then the connecting line consists of a horizontal line first and then a vertical line. If 'Y' is active then the connecting line consists of a vertical line first and then a horizontal line.

    If the first (second) part of the line intersects the first (second) drawing object then this part of the line is trimmed.

14. Menue item 'p'
    Used only with 'connect'. See this description.

15. Menue item 'X'
    Used only with 'connect'. See this description.

16. Menue item 'Y'
    Used only with 'connect'. See this description.

17. Menue item 'mirror'
    Objects are mirrored at a line. First this line is selected. Afterwards objects can be selected which are mirrored. Texts are only parially mirrored, the refernce point and the orientation of the text are correctly transformed. But the individual characters are not mirrored correctly.

18. Menue item 'attr?'
    You can request the display of some attributes not easily recognizable by selecting objects. The attributes linewidth, colour, and font of an object are displayed in the menue.

19. Menue item 'rotate'
    Objects are rotated by the number of degrees given in the field to the right of 'rotate'. The direction of rotation is in the mathematical sense (counter clockwise).

    First you have to select the objects, either by cklicking at individual objects or by an selection area. The selected objects blink.

    The rotation point is the point you clicked on or in the case of a selection area a point you are asked for. In the latter case you can define further rotations of the selected objects by defining further rotation points.

    The number of degrees is changed by clicking on the field with the degrees. Clicking with the left (right) mouse button adds 5 (30) degrees, modulo 360 degrees.

20. Menue item 'copy'
    Objects which have been selected or are within a selection rectangle can be copied to an other point of the window. The objects which are selected blink. There are two modes to copy, selected by field 'm' in the same line of the menue.

    Case 'm' not active: Copying is based on a transformation containing a translation, a rotation and a scaling. This transformation is defined by two lines, the reference line and the goal line. The transformation transforms the reference line into the goal line. After selecting the two lines you can select objects to be copied after applying the transformation.

    Case 'm' active before selecting copy: One or more objects can be selected either by clicking on them or by using a selection rectangle. The objects selected are blinking. If a selection rectangle is defined you are requested to click on a reference point otherwise the refernce point is the point you clicked on when selecting the object(s). After this you can copy the selected objects as often as you like by clicking on a goal point. The objects are copied in a way that goal point and refernce point coincide. There is no rotation and no scaling.

21. Menue item 'move'
    You can move objects from one place to another. Handling is the same as described for copying, but the original objects are deleted.

22. Menue item 'm' in the line of 'copy' and 'move'
    Copy or move objects with the mouse. See 'copy' for details.

23. Menue item 'complete'
    Two lines with one common end-point are selected. This two lines are complemented by two other lines to yield a parallelogram.

24. Menue item 'extend'
    You can select a line, a circular or an elliptical arc which is then extended with a predefined factor. The extension is starting from the endpoint wich is nearest to the point you clicked on. By extending an arc a whole circle or ellipse may result.

25. Menue item 'fill'
    (see also menue item '*')
    You select a drawing object to generate a filled drawing object of the same kind. The new object is always painted before all other existing objects, therefore it does not hide already existing objects.

    You may fill circles, ellipses, circular arcs, elliptical arcs, filled circular arcs, filled elliptical arcs, triangles and quadrangles.

    Triangles are defined by clicking on two intersecting lines. The parts you clicked on define two edges. Quadrangles are defined by clicking on two lines. This defines the four vertices for the filled quadrangle. There are two possible ways to connect the four points. To resolve this ambiguity we connect those endpoints of the two lines which are closest to the point clicked on when selecting the line.

26. Menue item 'trim'
    We define simple objects: lines, circles, ellipses, arcs, pieslices. A simple object T can be intersected other single objects or extended lines. A part of T between two intersection points or between an intersection point and an end point of T can be removed. First click on a point of T in the part to be removed. The select two simple objects, which define the intersection points. If only one other simple object is involved, select this same object twice. Removing the whole object T in this way is not possible.

27. Menue item 'up'
    You select one or more objects. This objects are moved up to the top of the hierarchy of drawing objects, this means they are painted last and may obscure other objects lower in the hierarchy. In addition the sequence of the selected objects in the hierarchy is reversed.

28. Menue item 'down'
    You select one or more objects. This objects are moved down to the bottom of the hierarchy of drawing objects, this means they are painted first and may be obscured by other objects higher in the hierarchy. The sequence of the selected objects in the hierarchy is not reversed.

29. Menue item 'delete'
    The selected object is deleted. If you press one of the keys BACKSPACE, DELETE oder UNDO all objects deleted since the last selection of the menue item 'delete' are restored.

30. Menue item 'cut'
    With the menue items 'cut' and 'paste' you may copy objects from one LaTeXdraw-window to an other LaTeXdraw-window. Selecting 'cut' defines this window as the from-window. Only one from-window can exist. After selecting 'cut' you have to define a reference point. Afterwards you can select objects by clicking on them or by defining a selection rectangle. Selected objects blink. If you select one object more than once, this has no effect. If to-windows are already defined then the objects selected are copied into the to-windows as soon as they are selected. Otherwise the objects selected are copied when a to-window comes into existence. The grouping of objects is not copied.

31. Menue item 'paste'
    Selecting 'paste' defines this window as a to-window. More than one to-window can be defined. After selecting 'paste' you have to define a goal point. A to-window is ready to accept selected objects from the from-window (see 'cut'). The copied objects from the from-window are translated so that the reference point in the from-window coincides with the goal point of the to-window.

32. Menue item '-*l*'
    Text is aligned left horizontally with the reference point.

33. Menue item '-*r*'
    Text is aligned right horizontally with the reference point.

34. Menue item '-*b*'
    The bottom of the text is aligned with the reference point.

35. Menue item '-*t*'
    The top of the text is aligned with the reference point.

36. Menue item '$*$'
    The drawing object selected is filled. No border line is generated. Circles, ellipses, arcs, rectangles, quadrangles and Bezier curves may be filled. Regular polygons are not filled, but connecting lines between vertices and center point are generated.

37. Menue item 'C'
    If the drawing objects 'circle' or 'ellipse' are selected circular arcs or elliptical arcs are drawn. They are filled, if in addition '$*$' is active.

38. Menue item '$||$'
    The symbol '$||$' stands for parallel.

    If you draw a line and '$||$' is active you want to draw a line parallel to line gp. You have to click on the first end point of the line. Then you click on a point to define roughly the direction the resulting line should go. Then you select the line gp. The generated line is as long as line gp and is parallel to gp.

If you draw an ellipse or a elliptical arc you want the main axis parallel to line gp. Again you have to click on the line gp as requested in the drawing process.

If you define text, the text can be oriented parallel to a line gp. Again you have to click on the line gp as requested in the drawing process.

39. Menue item '-|'
    The symbol '-|' stands for normal to. A line is defined by its starting point p and a line s. The end point of the line is the intersection of line s and its normal through point p.

40. Menue item 'mp'
    The symbol 'mp' stands for middle point.

    If 'mp' is active the point clicked on replaced by a modified point as follows:

    - Case 1: You clicked on a line then the resulting point is the middle point of the line.
    - Case 2: You clicked on a circle, an ellipse or an arc then the resulting point is the center point of the object.
    - Case 3: You clicked on a filled triangle or rectangle or quadrangle then the resulting point is the center of gravity of the object.
    - Case 4: The point you clicked on is too far from an object then the resulting point is the point you clicked on.

41. Menue item 'b>'
    An arrow is at the beginning of a line, an arc or a Bezier curve.

42. Menue item 'e>'
    An arrow is at the end of a line, an arc or a Bezier curve.

43. Menue item '—]'
    If this item is activated and there is no arrow at the end points selected, then solid lines are extended on both sides by half the linewidth.

44. Menue item '=<number>'
    This number represents the linewidth. By clicking on this field with the left (right) mouse button this number is incremented (decremented) by one modulo 20. The actual linewidth in points for printing is calculated as $0.57* < number >$. It may be changed in latexdraw.sty.

45. Menue item ' _ ' and not menue item ' . ' active
    Lines are dashed.

46. Menue item ' . ' and not menue item '_ ' active
    Lines are dotted.

47. Menue item ' _ ' and menue item ' . ' active
    Lines are dashed-dotted.

48. Menue items ' $< \wedge \vee >$ '
    Scrolling of the drawing by a fixed amount left, up, right or down. There is no problem if parts of the drawing are outside of the window. Scrolling of the

window can be done at any time, also between clicks defining one drawing object. Scrolling can also be done with the arrow keys of the keyboard.

49. Menue item ’[]’
The drawing is saved and work can continue.

50. Menue item ’groupmode’
Groupmode is activated, selecting one object may select all objects of a group. If single objects are to be selected, e.g. for changing their attributes or for deleting, then ’groupmode’ should not be active. Turning off groupmode does not destroy the group hierarchy but only deactivates it.

51. Menue item ’newgroup’
A new group of objects is generated. All objects or object groups you select until you click again on ’newgroup’ or on an other menue item are grouped together. The objects selected blink.

52. Menue item ’ungroup’
You ungroup a group of objects. First you click on an object, then all elements of the highest group this object is contained in blink. If you click on ’OK’ then this highest group is ungrouped into the single objects or the object groups this group consisted of.

53. Menue item ’showgroup’
You click on an object, then all elements of the highest group this object is contained in blink.

54. Menue item ’G’ (Grid)
A grid is always displayed. Since snap is defined in a new way it is rarely necessary to work without a grid.

    If you click on ’G’ then a square grid with a basic gridwidth is displayed where the center point, is the center of the drawing area.

    Then you may define three additional points or leave the grid definition by selecting an other menue item now or later at any point in the progress. In this case the grid defined at the moment you leave is the grid to be used.

    The first point gives the center point of the grid. Width and height of the mesh stay unchanged.

    The second point is the next grid point to the right of the center point. The grid may not be parallel to the x- and y-axis, but the mesh is rectangular. Width and height of the mesh are identical.

    The third point is the next grid point above the center point. The third and second point together define a grid, whose width and height are different and which is not rectangular.

    The width and height of the mesh changes also when scaling the drawing.

55. Menue item ’o’
The drawing is centered around the middle of the drawing area. This operation can be done at any time.

56. Menue item '+'
    The drawing is enlarged. This operation can be done at any time. You can also use key + of the keyboard.

57. Menue item '-'
    The drawing is scaled down. This operation can be done at any time. You can also use key - of the keyboard.

58. Menue item 'snap'
    When clicking on a point and 'snap' is active, then the point really used is in most cases the snap-in-point. If snap is not active, then the point used is the point you clicked on.

    The snap-in-point is the nearest hot-point of an object or grid, if this point is within a certain range. Otherwise it is the point you clicked on.

    Hot-points are

    - reference points of texts
    - endpoints of lines, arcs and Bezier-curves
    - center points of circles, ellipses and arcs
    - vertices of triangles, rectangles and quadrangels

59. Menue item 'xy'
    If 'xy' is active you define the next point not by clicking with the mouse button but by giving two floating point numbers separated by blanks via keyboard input. The coordinates are defined in gridunits relative to the center point of the grid. Input is finished with key RETURN.

60. Menue item 'deg'
    If 'deg' is active the next point to define an end point of an arc is not defined by clicking with the mouse button, but by keyboard input of a floating point number. This number gives the angle of the endpoint in degrees in the mathematical sense.

61. Menue item '<colornumber>:<colorname>'
    The number and name of the color used for strokes and for filling is given in this menue field. The background color of this field is this color. The number is incremented (decremented) by one through clicking with the left (right) mouse button on this field. You can also select a color by clicking on the special menue part.

    If a color is not available the corresponding field is black. The internal representation of the colors is with an integer value. Number 0 is black and number 1 is white. The actual colors used are defined in the style file latexdraw.sty by their RGB-values.

62. Menuefeld 'stdin'

    If activated, input from standard-input is expected and waited for. There are two cases:

First case: A complete Latexdraw-file arrives, including the headlines with a version number and other parameters as well as the trailing lines which define the groups. In this case all in the programm already existing drawing elements are deleted and only the newly arriving drawing elements are stored. This is equivalent to loading a new picture. This new picture is diplayed after input of the last line, then there is a delay of d seconds until a new interaction is possible (see menue item 'd:').

Second case: Only drawing elements are coming, without header lines or trailing lines. Already existing drawing elements are retained and not deleted. A newly arriving drawing element with positiv type is stored on top of the existing elements, therefore displayed last. If there is already a identical drawing element, which differs only in color or lineattributes, these attributes are taken from the newly arrived element and the latter is discarded afterwards. If the type of the element is negativ (-t) and there is an identical element with type t, then both elements are deleted. A drawing element has the structure as in the Latexdraw-file and must be contained in one line. The last element is followed by a line with 17 zeros separated by blanks. If such a line arrives, the drawing is displayed, then there is a delay of d seconds until a new interaction is possible (see menue item 'd:').

Input using standard input can consist of an arbitrary mixed sequence of the obove mentioned two input types. Only after input of a whole line interactions with the menue of the window is possible. There are no restrictions in the actions possible, e.g. it is possible to activate other menue-items and continue standard input later.

The feature is especially useful for on-line animations, therefore grid points and click marks are not displayed in this mode.

63. Menue item 'd:<dauer>s'

    The value <dauer> represents the delay in seconds after input of drawings using standard input (see stdin). The value is incremented (decremented) by clicking on this field with the left (right) mouse button.

64. Menue item 'chatt'
    You can change the attributes of objects by first clicking on the attribute in the menue and then selecting objects. The process of changing attributes and selecting objects can be repeated. The attributes linewidth, colour, type of line, arrows, font and text-alignment can be changed. Only those attributes are changed which have been clicked on at least once after selecting 'chatt'!

4 LaTeXdraw–file

The LaTeXdraw–file is an ASCII-file. It is one of the two output files of LaTeXdraw. It can easily be read or modified by an user. Each line represents an object. The first number gives the type of the drawing object, e.g. circle. Then coordinates and other attributes follow. Each line for an object has the same number of values, even if not all are needed. If the object is of type text, then the following line contains the text string. After the input lines which define objects a line with zeroes is included.

The header of the LaTeXdraw–output file gives internal parameters. The trailer of the LaTeXdraw–output file gives the group hierarchy.

A LaTeXdraw–file can be input file to LaTeXdraw.

5 LaTeX-file

The LaTeX-file is the second output file of LaTeXdraw. It is the LaTeX source file representing the drawing. It is used with latexdraw.sty and pstricks.tex. To convert the DVI-file to Postscript dvips is used.

The LaTeX-file is also an ASCII-file and can be modified by the user if necessary. There are two output modes available (defined when you save a picture):

1. The LaTeX-file is a complete LaTeX-document which can be translated by latex without further changes or additions. Then it can be translated to a postscript-file with dvips.
2. The LaTeX-file contains only the picture itsself without headers and trailers. It starts with \beginpicture and ends with \endpicture. This type of file is used for including in an other document by \include.... In this case macros defined outside the picture can be used in text strings in the picture.

6 Internal format of the LaTeXdraw–file

All versions of the LaTeXdraw–files are upward compatible.

6.1 Header

The header consists of 7 lines:

- line 1:
  Name and version of the program this file was generated with
- line 2:
  All coordinate values (dimensions) in the file are given in pixels. The value given in line 2 is the size of one pixel in mm. It is used as "\unitlength". The number is followed by a comment in brackets.
- line 3:
  The line consists of a number followed by a comment in brackets. This line is no longer evaluated.
- line 4:
  The line consists of a number followed by a comment in brackets.This line is no longer evaluated.

- line 5:
  The line consists of a number followed by a comment in brackets.This line is no longer evaluated.
- line 6:
  The line contains 8 numbers and a comment in brackets. The numbers are used for generating the grid in the drawing window.
- line 7:
  The line contains 10 numbers and a comment in brackets. The numbers are:
  - x and y for lower left point of picture in pixels
  - x and y for upper right point of picture in pixels
  - number of pixels in x and in y dimension (size of the picture)
  - maximum width and height of printed picture in mm as given as output-option by the user.
  - standalone document (1), document ready to include in other document (0)
  - rotate picture (0), dont rotate picture (1)

  An example of the header is:

```
LaTeXdraw (Siegert, TUM, C15.06)Digi
 2.64706E-01  (TEXFAKTOR)
 2.00000E+00  (TEXDASHLAENGE)
 1.80000E+00  (TEXDOTGAP)
 8.00000E-01  (TEXINTERDOTGAP)
16.667 16.667 562.400 294.750 1.000 0.000 0.000 1.000  (GITTERWERTE)
210.000 78.083 838.000 518.000 628.000 439.917 165.600 228.000 1 1 (AUSGABEOPTIONEN)
```

6.2 Drawing objects

The drawing objects are specified after the header. For each drawing object one line is used. Each line consists of 17 integer or floating point values. After the last drawing object there is a line with 17 zeroes. The numbers are separated with a blank. Some of the numbers are redundant, e.g. the point (xb1, yb1) for arcs. All redundant parameters are not used when inputting the file. These values are calculated again within LaTeXdraw. Redundant parameters are not mentioned in the description of the objects. Some parameters may not be defined for an object. Those parameters are also not mentioned there.

The sequence of the objects defines implicitly a sequence number, starting with 1. The sequence defines the sequence in which the objects are painted.

The x-coordinate points to the right, the y-coordinate upwards. Angles are in the mathematical sense (counterclockwise). All angles are given in multiples of 0.1 degree.

The parameters of an object are (according to the their sequence in the line):
typ, x1, y1, x2, y2, xb1, yb1, xb2, yb2, wanf, wend, liniendicke, linienende, linientyp, lx, ly, rotwi

6.2.1 Parameters for different objects

typ=2 Text

x1,y1	reference point
ly = 0	aligned left and bottom
ly = 1	centered all
ly = 2	aligned right and bottom
ly = 3	horizontally centered, aligned bottom
ly = 4	aligned left and top
ly = 5	aligned right and top
ly = 6	horizontally centered, aligned top
ly = 7	aligned left, vertically centered
ly = 8	aligned right, vertically centered
linientyp	number of font

the following line contains the text string!

typ=3 line

x1,y1	first end point
x2,y2	second end point

typ=5 circle

x1,y1	center point
lx	radius
ly	= lx

typ=6 filled circle

x1,y1	center point
lx	radius
ly	= lx

typ=7 circular arc

x1,y1	center point
lx	radius
ly	= lx
wanf	angle of start point (in 0.1 degrees), $0 \leq wanf \leq 3600$
wend	angle of end point (in 0.1 degrees), $0 \leq wend \leq 3600$

typ=8 ellipse

x1,y1	center point
lx	semimajor axis
ly	semiminor axis

typ=9 filled ellipse

x1,y1	center point
lx	semimajor axis
ly	semiminor axis

typ=10 elliptic arc

x1,y1	center point
lx	semimajor axis
ly	semiminor axis
wanf	angle of start point (in 0.1 degrees), $0 \leq wanf \leq 3600$
wend	angle of end point (in 0.1 degrees), $0 \leq wend \leq 3600$

typ=11	filled rectangle	
	x1,y1	first vertix
	xb1,yb1	second vertix
	x2,y2	third vertix (diagonal to the first)
	xb2,yb2	fourth vertix
typ=12	Bezier curve	
	x1,y1	start point
	xb1,yb1	point to define tangent to start point
	xb2,yb2	point to define tangent to end point
	x2,y2	end point
typ=13	filled triangle	
	x1,y1	first vertix
	xb1,yb1	second vertix
	x2,y2	third vertix
typ=14	filled quadrangle	
	x1,y1	first vertix
	xb1,yb1	second vertix
	x2,y2	third vertix (diagonal to the first)
	xb2,yb2	fourth vertix
typ=15	filled circular arc	
	x1,y1	center point
	lx	radius
	ly	= lx
	wanf	angle of start point (in 0.1 degrees), $0 \le$ wanf ≤ 3600
	wend	angle of end point (in 0.1 degrees), $0 \le$ wend ≤ 3600
typ=16	filled elliptic arc	
	x1,y1	center point
	lx	semimajor axis
	ly	semiminor axis
	wanf	angle of start point (in 0.1 degrees), $0 \le$ wanf ≤ 3600
	wend	angle of end point (in 0.1 degrees), $0 \le$ wend ≤ 3600

6.2.2 Common parameters

liniendicke	=	100 ∗ colornumber + linewidth	
linienende	=	0	line end butt
linienende	=	1	arrow at first point
linienende	=	2	arrow at second point
linienende	=	3	arrow at both ends
linienende	=	4	line protruding
linientyp	=	1	solid line
linientyp	=	2	dotted line
linientyp	=	3	dotted line
linientyp	=	5	dashed line
linientyp	=	7	dashed-dotted line

The rotation of ellipses or elliptic arcs is given by 'rotwi'. It is the angle in 0.1 degrees from the positive x-axis to the major axis.

The rotation of texts is given by 'rotwi', the angle between the positive x-axis and the baseline of the text.

6.3 Structure of the groups

The group structure is stored after the drawing objects. There are two parts:

- Part 1: Definition which drawing object belongs to which group
  For each group which has at least one drawing object as a direct member and not only other groups the following blank separated list is given: The number of the group followed by the sequence numbers of the drawing objects which are direct members. This list ends with a zero. The sequence number of a drawing object is given by the list of drawing objects.

  Each drawing object can be a direct member of only one group. A drawing object which is not member of a group is not listed.

  Part 1 is concluded with a zero.

- Part 2: Definition of the group hierarchy.
  This part is a blank separated list of pairs of numbers concluded with two zeros. Each pair gives a groupnumber and the number of the parent group. Groups which do not have a parent group are not listed.

□

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