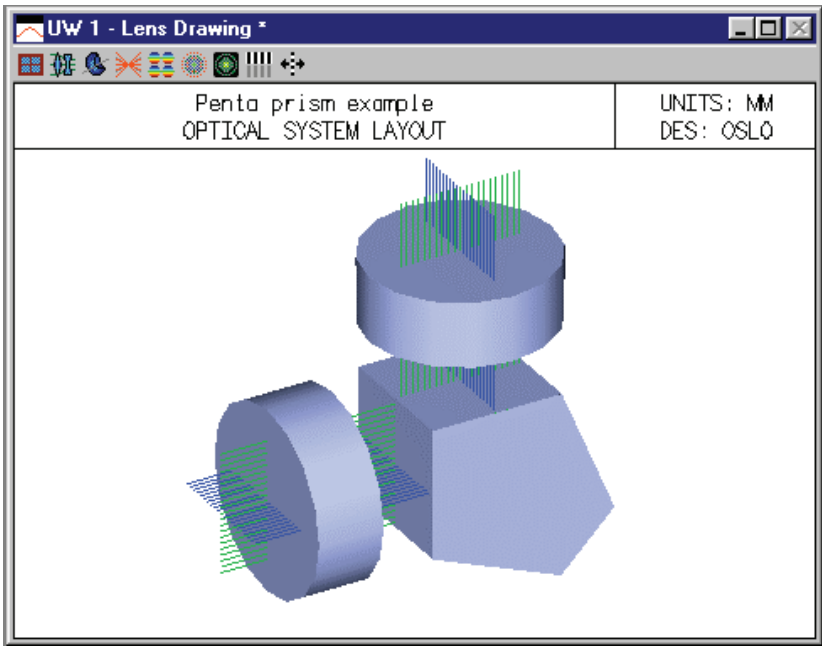
Pentaprism

A pentaprism changes the direction of a beam by 90 degrees. It is straightforward to enter such a system using the bend command in OSLO. However, to draw a picture of the system requires special work because of the nature of the prism. The system shown here uses OSLO's boundary data information (**bdi**) to draw the prism, as shown in the figure below.

The pentaprism system included here is intended as a base system into which you can insert your own optics as required. Blank pieces of glass are placed in front and behind the prism for demonstration. The data are shown in the following list.




```
*LENS DATA
Penta prism example
 SRF      RADIUS      THICKNESS   APERTURE RADIUS       GLASS SPE   NOTE
  0         --        1.0000e+20    1.0000e+14            AIR

  1         --          1.000000      1.414214 A          BK7 C *
  2         --          1.000000      1.414214            AIR     Your lens

  3         --          2.414214      1.000000 X         BAK1 C *
  4         --         -2.000000      1.082400 X      REFLECT   *
  5         --          2.414214      1.082400 X      REFLECT   *
  6         --          1.000000      1.000000 X          AIR   * Penta prism

  7         --          1.000000      1.414214            BK7 C *
  8         --            --          1.414214            AIR     Your lens

  9         --            --          1.414214
```

From an optical standpoint, the interesting surfaces are 3-6. The orientation of the surfaces is straightforward and easily handled by the **ben** command. The sides of the prism are rectangular, so each surface must have a rectangular special aperture, calculated according to the standard pentaprism geometry. Since the actual prism surfaces are to be represented by **bdi** information (in contrast to being enclosed in a bounding box, it is important
that the drawing information accurately represent the true situation.

```
*TILT/DECENTER DATA
  4      DT    1          DCX         --        DCY        --        DCZ        --
         BEN              TLA     22.500000    TLB        --        TLC        --
  5      DT    1          DCX         --        DCY        --        DCZ        --
         BEN              TLA     22.500000    TLB        --        TLC        --

*APERTURES
 SRF    TYPE APERTURE RADIUS
  0      SPC   1.0000e+14
  1      SPC     1.414214
```

```
  2     SPC     1.414214
  3     SPC     1.000000
     Special Aperture Group 0:
     A  ATP    Rectangle  AAC     Transmit  AAN       --
        AX1    -1.000000  AX2     1.000000  AY1    -1.000000  AY2     1.000000
  4     SPC     1.082400
     Special Aperture Group 0:
     A  ATP    Rectangle  AAC     Transmit  AAN       --
        AX1    -1.082400  AX2     1.082400  AY1    -1.082400  AY2     1.082400
  5     SPC     1.082400
     Special Aperture Group 0:
     A  ATP    Rectangle  AAC     Transmit  AAN       --
        AX1    -1.082400  AX2     1.082400  AY1    -1.082400  AY2     1.082400
  6     SPC     1.000000
     Special Aperture Group 0:
     A  ATP    Rectangle  AAC     Transmit  AAN       --
        AX1    -1.000000  AX2     1.000000  AY1    -1.000000  AY2     1.000000
  7     SPC     1.414214
  8     SPC     1.414214
  9     SPC     1.414214
```

For the drawing, surfaces 3-6 are marked “not drawn” in the special data surface control spreadsheet:

```
*SURFACE TAG DATA
  1     LMO ELE  (2 surfaces)
  3     LMO ELE  (4 surfaces)
  3     DRW OFF
  4     DRW OFF
  5     DRW OFF
  6     DRW OFF
  7     LMO ELE  (2 surfaces)
```

There is no spreadsheet for entering boundary data. You can use the normal lens editor in command mode, giving the commands

```
len upd
gto 3
bdi 16 9
vx 1 -1 -1 0 0
vx 2 -2 2 0 0
.
pf 1 1 2 3 4
pf 2  5 6 7 8
.
etc. according to the list below:
end
```

In connection with the input of bdi data, please note that the data must be preceded by a bdi command that states how many vertices and how many polygon faces are to be used.

The last number in each vertex record is the surface number relative to the current surface. In the output listing, this is converted into an absolute surface number reference.

```
*BOUNDARY DRAWING DATA
 SRF 3:
 VX NBR         X            Y            Z        COORD SURF
    1       -1.000000    -1.000000       --            3
    2       -1.000000     1.000000       --            3
    …etc.
 PF NBR        VX1          VX2          VX3          VX4
    1           1            2            3            4
    2           5            6            7            8
    …etc.
```