‘pst-circ’

A PSTricks package for drawing electic circuits

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Abstract: ‘pst-circ’ is a PSTricks package to draw easily electric circuits. Most dipoles, tripoles and quadrupoles used in classical electrotechnic circuits are ...

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2.1 Parameters

There are specific paramaters defined to change easily the behaviour of the pst-circ objects you are drawing.

`intensity` **(boolean):** (*default: false*)

`intensitylabel` **(string):** (*default:* `\empty`)

`intensitylabeloffset` **(dimension):** (*default: 0.5*)

`intensitycolor` **(PSTricks color):** (*default: black*)

`intensitylabelcolor` **(PSTricks color):** (*default: black*)

`intensitywidth` **(dimension):** (*default:* `\pslinewidth`)

`tension` **(boolean):** (*default: false*)

`tensionlabel` **(string):** (*default:* `\empty`)

`tensionoffset` **(dimension):** (*default: 1*)

`tensionlabeloffset` **(dimension):** (*default: 1.2*)

`tensioncolor` **(PSTricks color):** (*default: black*)

`tensionlabelcolor` **(PSTricks color):** (*default: black*)

`tensionwidth` **(dimension):** (*default:* `\pslinewidth`)

`labeloffset` **(dimension):** (*default: 0.7*)

`labelangle` **(PSTricks label angle):** (*default: 0*)

`dipoleconvention`**:** (*default: receptor*)

`directconvetion` **(boolean):** (*default: true*)

`dipolestyle` **(string):** (*default: normal*)

`variable` **(boolean):** (*default: false*)

`parallel` **(boolean):** (*default: false*)

`parallelarm` **(dimension):** (*default: 1.5*)

`parallelsep` **(real):** (*default: 0*)

`parallelnode` **(boolean):** (*default: false*)

`intersect` **(boolean):** (*default: false*)

`intersectA` **(node):**

`intersectB` **(node):**

`OAinvert` **(boolean):** (*default: true*)

`OAperfect` **(boolean):** (*default: true*)

`OAiplus` **(boolean):** (*default: false*)

`OAiminus` **(boolean):** (*default: false*)

`OAiout` **(boolean):** (*default: false*)

`OAipluslabel` **(string):** (*default:* `\empty`)

`OAiminuslabel` **(string):** (*default:* `\empty`)

`OAioutlabel` **(string):** (*default:* `\empty`)

`transistorinvert` **(boolean):** (*default: false*)

`transistoribase` **(boolean):** (*default: false*)

`transistoricollector` **(boolean):** (*default: false*)

`transistoriemitter` **(boolean):** (*default: false*)

`transistoribaselabel` **(string):** (*default:* `\empty`)

`transistoricollectorlabel` **(string):** (*default:* `\empty`)

`transistoriemitterlabel` **(string):** (*default:* `\empty`)

`transistortype` **(string):** (*default: PNP*)

`primarylabel` **(string):** (*default:* `\empty`)

`secondarylabel` **(string):** (*default:* `\empty`)

`transformeriprimary` **(boolean):** (*default: false*)

`transformerisecondary` **(boolean):** (*default: false*)

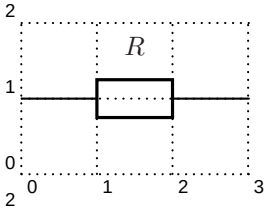
`transformeriprimarylabel` **(string):** (*default:* `\empty`)

`transformerisecondarylabel` **(string):** (*default:* `\empty`)

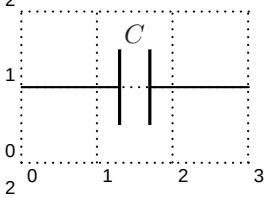
`tripolestyle` **(string):** (*default: normal*)

3 Macros

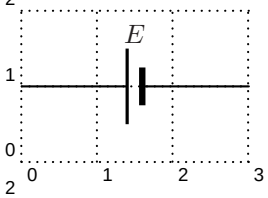
3.1 Dipole macros



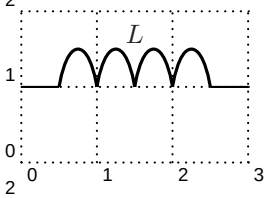

```
\pnode(0,1){A}
\pnode(3,1){B}
\resistor(A)(B){$R$}
```



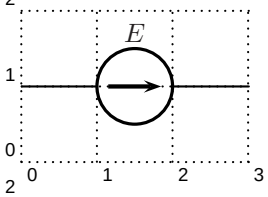

```
\pnode(0,1){A}
\pnode(3,1){B}
\capacitor(A)(B){$C$}
```



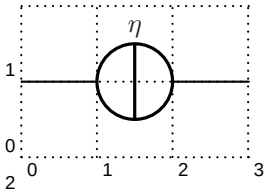

```
\pnode(0,1){A}
\pnode(3,1){B}
\battery(A)(B){$E$}
```



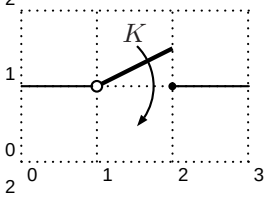

```
\pnode(0,1){A}
\pnode(3,1){B}
\coil(A)(B){$L$}
```



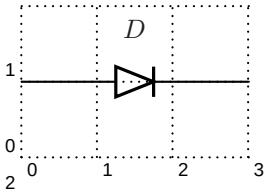

```
\pnode(0,1){A}
\pnode(3,1){B}
\Ucc(A)(B){$E$}
```



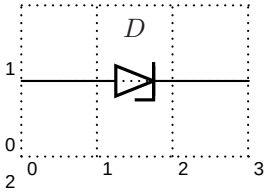

```
\pnode(0,1){A}
\pnode(3,1){B}
\Icc(A)(B){$\eta$}
```



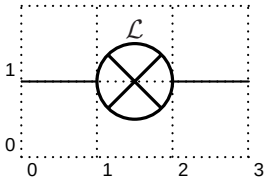

```
\pnode(0,1){A}
\pnode(3,1){B}
\switch(A)(B){$K$}
```



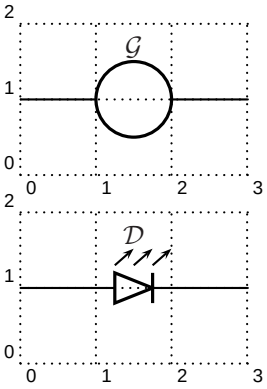

```
\pnode(0,1){A}
\pnode(3,1){B}
\diode(A)(B){$D$}
```




```
\pnode(0,1){A}
\pnode(3,1){B}
\Zener(A)(B){$D$}
```




```
\pnode(0,1){A}
\pnode(3,1){B}
\lamp(A)(B){$\mathcal L$}
```



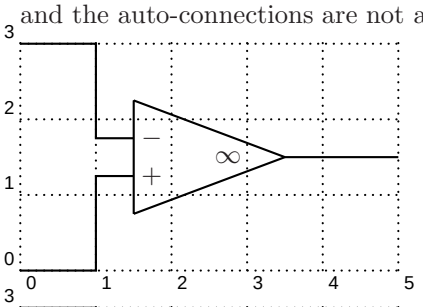

```
\pnode(0,1){A}
\pnode(3,1){B}
\circledipole(A)(B){$\mathcal G$}
```



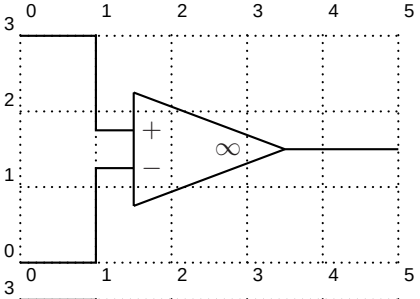
```
\pnode(0,1){A}
\pnode(3,1){B}
\LED(A)(B){$\mathcal D$}
```

3.2 Tripole macros

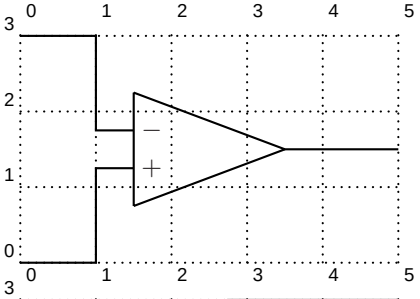
Obviously, tripoles are not node connections. So **'pst-circ'** tries its best to adjust the position of the tripole regarding the three nodes. Internally, the connections are done by the `\ncangle` pst-node macro. However, the auto-positionning and the auto-connections are not always well chosen[1], so don't try to use tripole macros in strange situations!



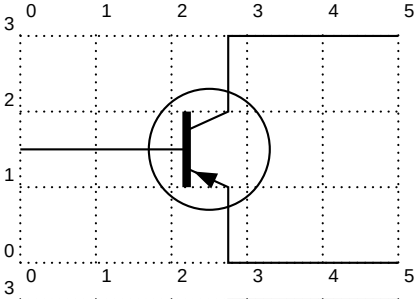
```
\pnode(0,0){A}
\pnode(0,3){B}
\pnode(5,1.5){C}
\OA(B)(A)(C)
```



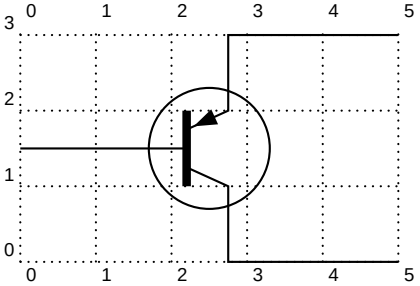
```
\pnode(0,0){A}
\pnode(0,3){B}
\pnode(5,1.5){C}
\OA[OAinvert=false](B)(A)(C)
```



```
\pnode(0,0){A}
\pnode(0,3){B}
\pnode(5,1.5){C}
\OA[OAperfect=false](B)(A)(C)
```

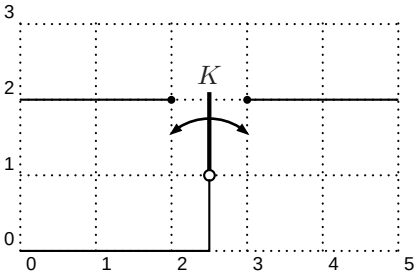


```
\pnode(0,1.5){A}
\pnode(5,3){B}
\pnode(5,0){C}
\transistor(A)(B)(C)
```



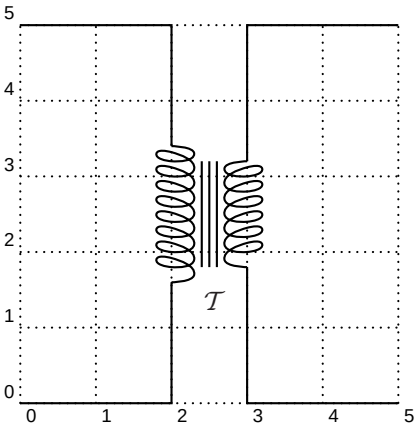
```
\pnode(0,1.5){A}
\pnode(5,3){B}
\pnode(5,0){C}
\transistor[transistorinvert](A)(B)(C)
```

[1] This is something I'm working on. I think that auto-positionning and auto-connections should be done at PostScript level and not at PSTricks level. If someone has any ideas, please mail me.




```
\pnode(0,2){A}
\pnode(5,2){B}
\pnode(0,0){C}
\Tswitch(A)(B)(C){$K$}
```

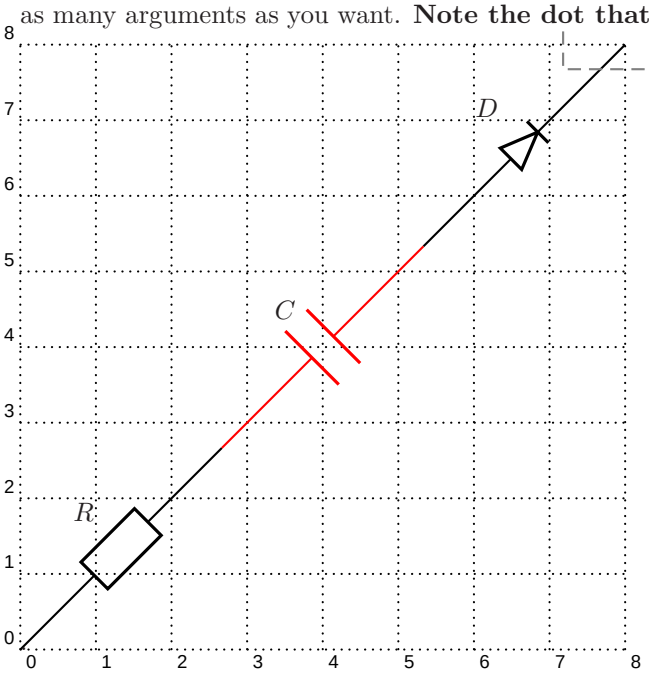
3.3 Quadrupole macros




```
\pnode(0,5){A}
\pnode(0,0){B}
\pnode(5,5){C}
\pnode(5,0){D}
\transformer(A)(B)(C)(D){$\mathcal T$}
```

3.4 Multidipole

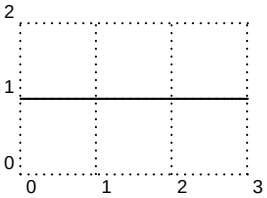
`\multidipole` is a macro that allows multiple dipoles to be drawn between two specified nodes. `\multidipole` takes as many arguments as you want. **Note the dot that is after the last dipole.**




```
\pnode(0,0){A}
\pnode(8,8){B}
\multidipole(A)(B)\resistor{$R$}%
  \capacitor[linecolor=red]{$C$}%
  \diode{$D$}.
```

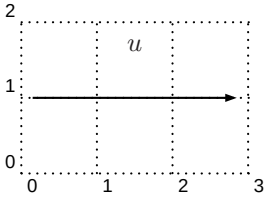
Important: for the time being, `\multidipole` takes optional arguments but does not restore original values. We recommand not using it.

3.5 Wire



```
\pnode(0,1){A}
\pnode(3,1){B}
\wire(A)(B)
```

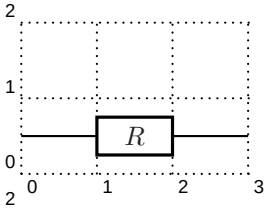
3.6 Tension



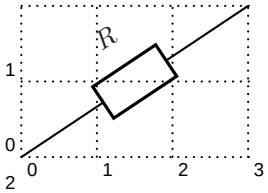

```
\pnode(0,1){A}
\pnode(3,1){B}
\tension(A)(B){$u$}
```

4 Parameters

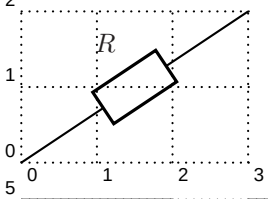
4.1 Label parameters



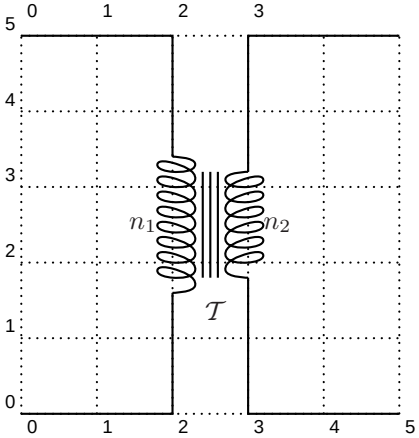

```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor[labeloffset=0](A)(B){$R$}
```




```
\pnode(0,0){A}
\pnode(3,2){B}
\resistor[labelangle=:U](A)(B){$R$}
```




```
\pnode(0,0){A}
\pnode(3,2){B}
\resistor[labelangle=0](A)(B){$R$}
```

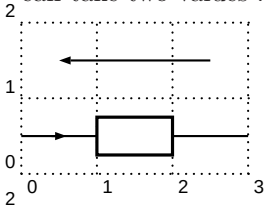



```
\pnode(0,5){A}
\pnode(0,0){B}
\pnode(5,5){C}
\pnode(5,0){D}
\transformer[primarylabel=$n_1$,
  secondarylabel=$n_2$](A)(B)(C)(D){$\mathcal T$}
```

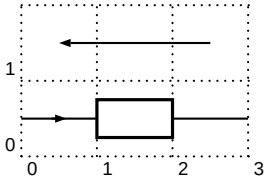
4.2 Intensity and tension parameters

If the `intensity` parameter is set to `true`, an arrow is drawn on the wire connecting one of the node to the dipole. If the `tension` parameter is set to `true`, an arrow is drawn parallel to the dipole.

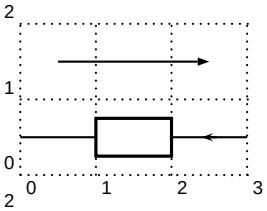
The way those arrows are drawn is set by `dipoleconvention` and `directconvention` parameters. `dipoleconvention` can take two values : `generator` or `receptor`. `directconvention` is a boolean.



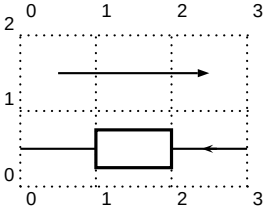
```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor[intensity,tension](A)(B){}
```



```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor[intensity,tension,
  dipoleconvention=receptor](A)(B){}
```

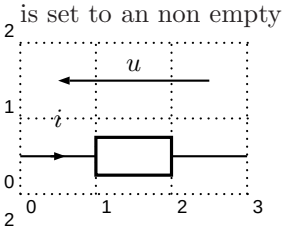


```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor[intensity,tension,
  directconvention=false](A)(B){}
```

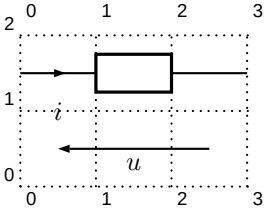


```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor[intensity,tension,
  dipoleconvention=receptor,directconvention=false](A)(B){}
```

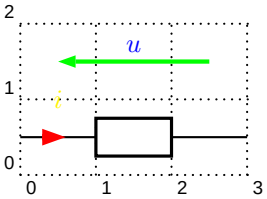
If `intensitylabel` is set to an non empty argument, then `intensity` is automatically set to true. If `tensionlabel` is set to an non empty argument, then `tension` is automatically set to true.




```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor[intensitylabel=$i$,tensionlabel=$u$](A)(B){}
```

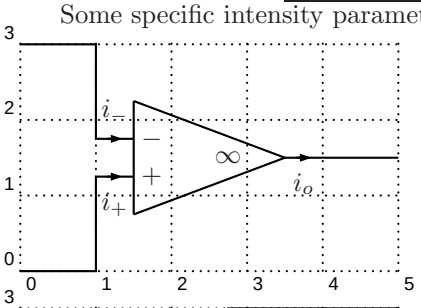



```
\pnode(0,1.5){A}
\pnode(3,1.5){B}
\resistor[intensitylabel=$i$,intensitylabeloffset=-0.5,
  tensionlabel=$u$,tensionlabeloffset=-1.2,
  tensionoffset=-1](A)(B){}
```

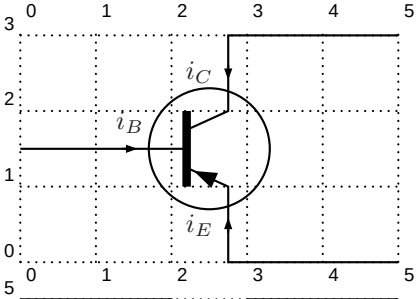



```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor[intensitylabel=$i$,intensitywidth=3\pslinewidth,
  intensitycolor=red,intensitylabelcolor=yellow,
  tensionlabel=$u$,tensionwidth=2\pslinewidth,
  tensioncolor=green,tensionlabelcolor=blue](A)(B){}
```

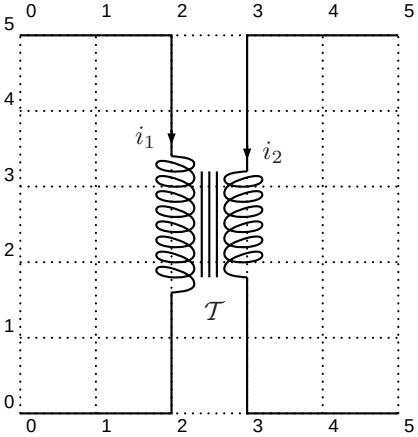
Some specific intensity parameter are set for tripoles and quadrupoles.




```
\pnode(0,0){A}
\pnode(0,3){B}
\pnode(5,1.5){C}
\OA[OAipluslabel=$i_+$,
  OAiminuslabel=$i_-$,
  OAioutlabel=$i_o$](B)(A)(C)
```



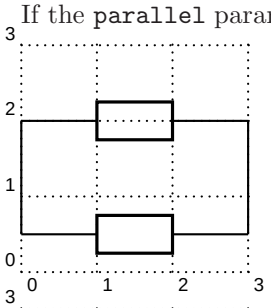

```
\pnode(0,1.5){A}
\pnode(5,3){B}
\pnode(5,0){C}
\transistor[transistoribaselabel=$i_B$,
  transistoricollectorlabel=$i_C$,
  transistoriemitterlabel=$i_E$](A)(B)(C)
```



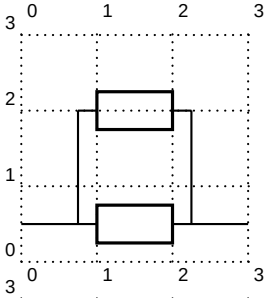

```
\pnode(0,5){A}
\pnode(0,0){B}
\pnode(5,5){C}
\pnode(5,0){D}
\transformer[transformeriprimarylabel=$i_1$,
  transformerisecondarylabel=$i_2$]%
  (A)(B)(C)(D){$\mathcal T$}
```

4.3 Parallel parameters

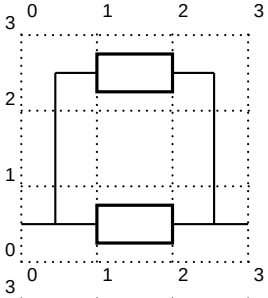
If the `parallel` parameter is set to `true`, the dipole is drawn parallel to the line connecting the nodes.



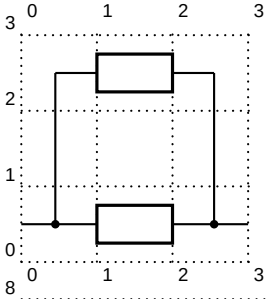
```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor(A)(B){}
\resistor[parallel](A)(B){}
```



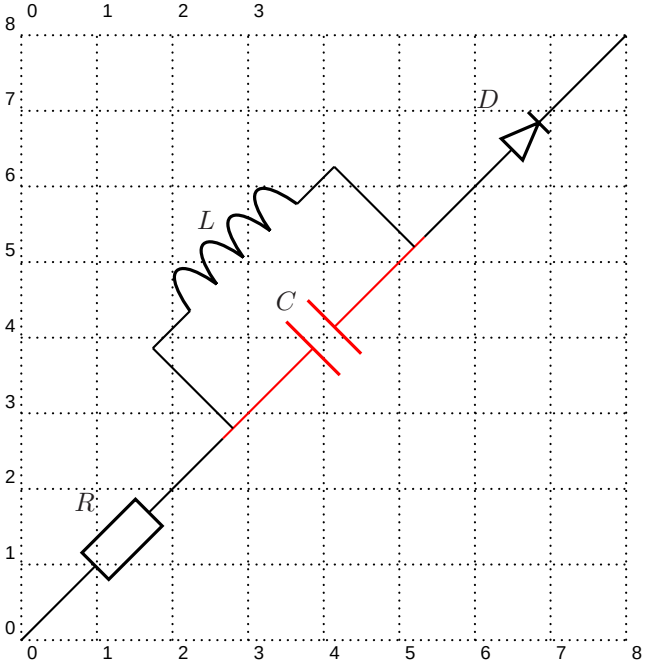
```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor(A)(B){}
\resistor[parallel,parallelsep=.5](A)(B){}
```



```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor(A)(B){}
\resistor[parallel,parallelsep=.3,
  parallelarm=2](A)(B){}
```



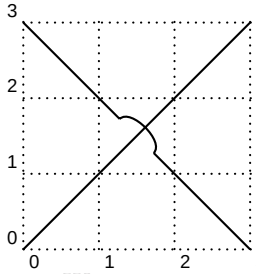
```
\pnode(0,.5){A}
\pnode(3,.5){B}
\resistor(A)(B){}
\resistor[parallel,parallelsep=.3,
  parallelarm=2,parallelnode](A)(B){}
```




```
\pnode(0,0){A}
\pnode(8,8){B}
\multidipole(A)(B)\resistor{$R$}%
  \capacitor[linecolor=red]{$C$}%
  \coil[parallel,parallelsep=.1]{$L$}%
  \diode{$D$}.
```

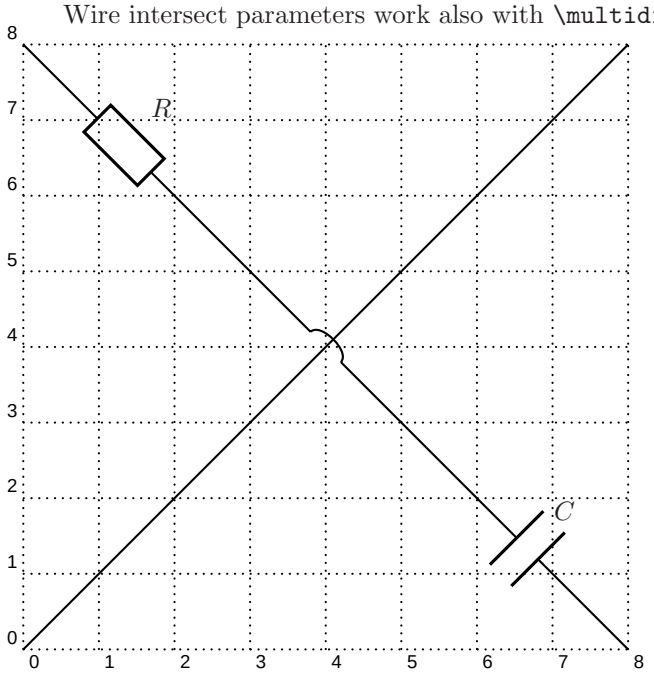
Note: when using parallel `parameter` with `\multidipole`, it must not be set for the first dipole.

4.4 Wire parameters



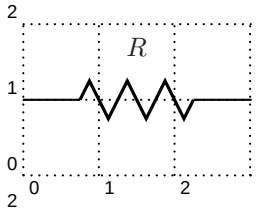
```
\pnode(0,0){A}
\pnode(3,3){B}
\pnode(0,3){C}
\pnode(3,0){D}
\wire(A)(B)
\wire[intersect,intersectA=A,intersectB=B](C)(D)
```

Wire intersect parameters work also with `\multidipole`.

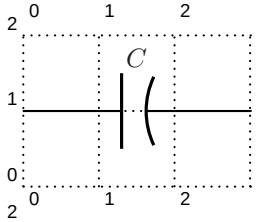



```
\pnode(0,0){A}
\pnode(8,8){B}
\pnode(0,8){C}
\pnode(8,0){D}
\wire(A)(B)
\multidipole(C)(D)\resistor{$R$}%
  \wire[intersect,intersectA=A,intersectB=B]%
  \capacitor{$C$}.
```

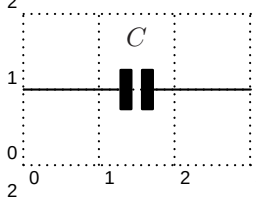
4.5 Dipole style parameters



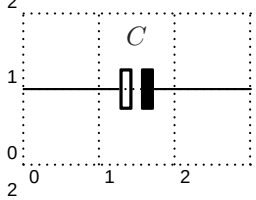

```
\pnode(0,1){A}
\pnode(3,1){B}
\resistor[dipolestyle=zigzag](A)(B){$R$}
```



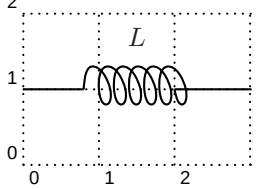

```
\pnode(0,1){A}
\pnode(3,1){B}
\capacitor[dipolestyle=chemical](A)(B){$C$}
```



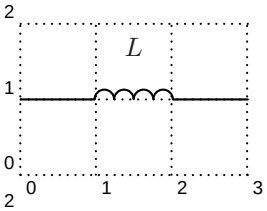

```
\pnode(0,1){A}
\pnode(3,1){B}
\capacitor[dipolestyle=elektor](A)(B){$C$}
```



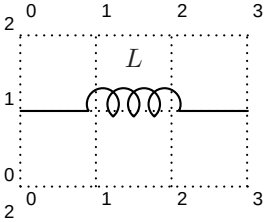

```
\pnode(0,1){A}
\pnode(3,1){B}
\capacitor[dipolestyle=elektorchemical](A)(B){$C$}
```



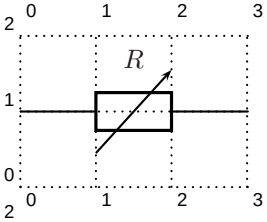

```
\pnode(0,1){A}
\pnode(3,1){B}
\coil[dipolestyle=curved](A)(B){$L$}
```



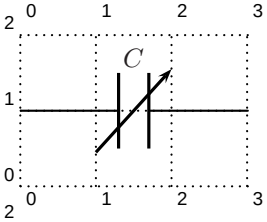

```
\pnode(0,1){A}
\pnode(3,1){B}
\coil[dipolestyle=elektor](A)(B){$L$}
```



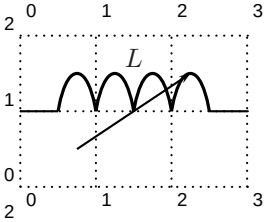

```
\pnode(0,1){A}
\pnode(3,1){B}
\coil[dipolestyle=elektorcurved](A)(B){$L$}
```



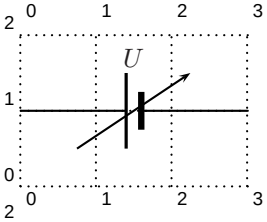

```
\pnode(0,1){A}
\pnode(3,1){B}
\resistor[variable](A)(B){$R$}
```



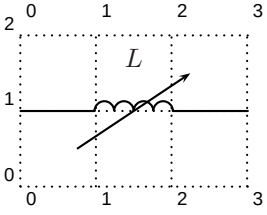

```
\pnode(0,1){A}
\pnode(3,1){B}
\capacitor[variable](A)(B){$C$}
```




```
\pnode(0,1){A}
\pnode(3,1){B}
\coil[variable](A)(B){$L$}
```

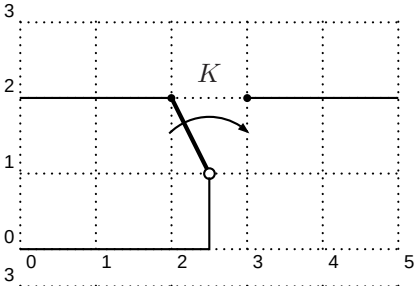



```
\pnode(0,1){A}
\pnode(3,1){B}
\battery[variable](A)(B){$U$}
```

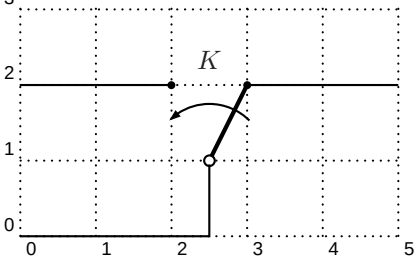



```
\pnode(0,1){A}
\pnode(3,1){B}
\coil[dipolestyle=elektor,variable](A)(B){$L$}
```

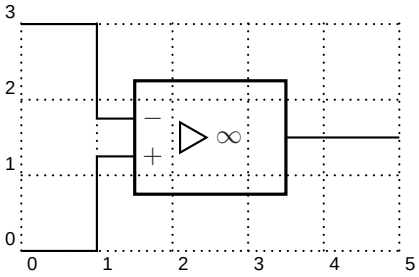
4.6 Tripole style parameters




```
\pnode(0,2){A}
\pnode(5,2){B}
\pnode(0,0){C}
\Tswitch[tripolestyle=left](A)(B)(C){$K$}
```

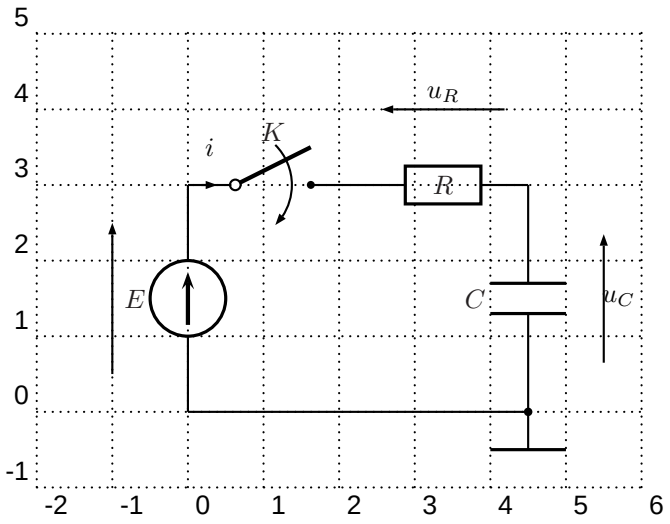



```
\pnode(0,2){A}
\pnode(5,2){B}
\pnode(0,0){C}
\Tswitch[tripolestyle=right](A)(B)(C){$K$}
```

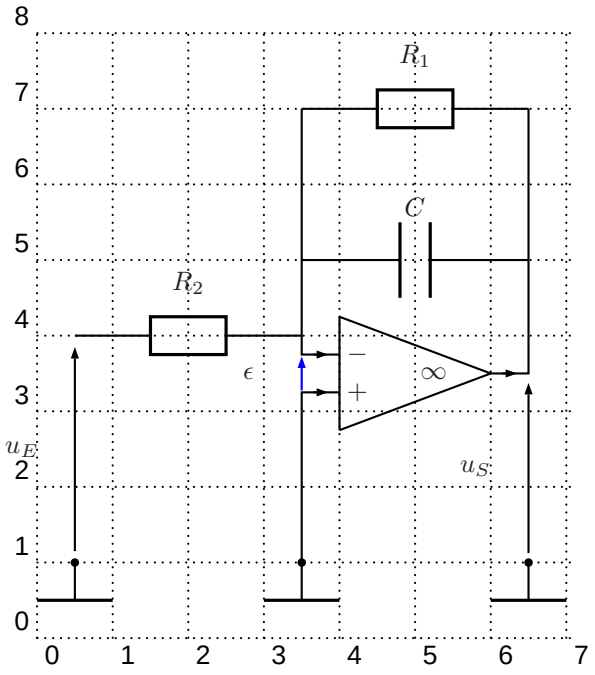


```
\pnode(0,3){A}
\pnode(0,0){B}
\pnode(5,1.5){C}
\OA[tripolestyle=french](A)(B)(C)
```

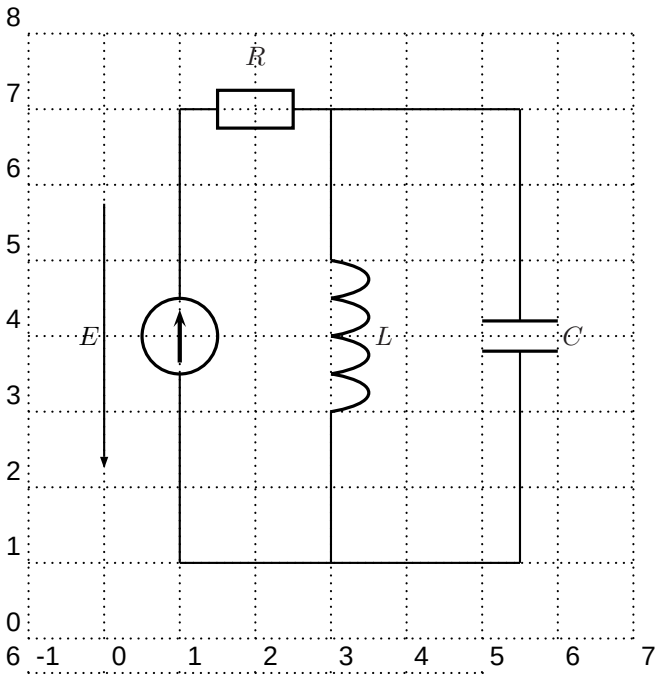
5 Examples



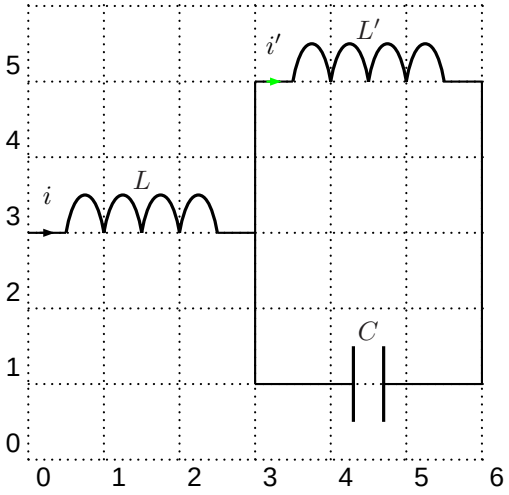

```
\begin{pspicture}(-1.5,-1)(6,5)
\psgrid[subgriddiv=1,griddots=10]
% Node definitions
\pnode(0,0){A}
\pnode(0,3){B}
\pnode(4.5,3){C}
\pnode(4.5,0){D}
% Dipole node connection
\Ucc[tension,dipoleconvention=generator](A)(B){$E$}
\multidipole(B)(C)%
  \switch[intensitylabel=$i$]{$K$}%
  \resistor[labeloffset=0,tensionlabel=$u_R$]{$R$}.
\capacitor[tensionlabel={$u_C$},
  tensionlabeloffset=-1.2,tensionoffset=-1,
  directconvention=false](D)(C){$C$}
% Wire to complete circuit
\wire(A)(D)
% Ground
\ground(D)
\end{pspicture}
```



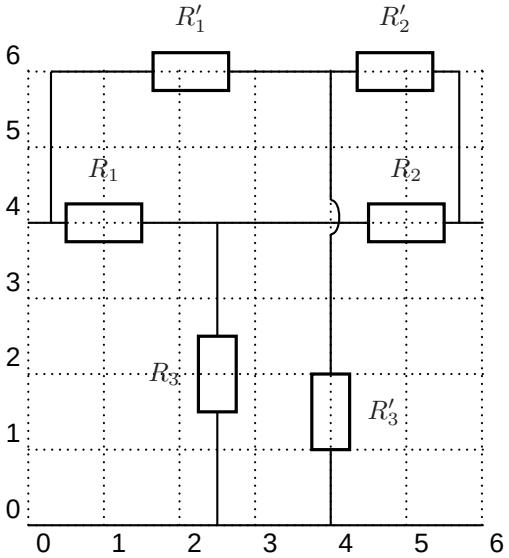

```
\begin{pspicture}(-0.5,0)(7,8)
\psgrid[subgriddiv=1,griddots=10]
% Node definitions
\pnode(0.5,1){A}
\pnode(3.5,1){B}
\pnode(6.5,1){C}
\pnode(0.5,4){D}
\pnode(3.5,4){Minus}
\pnode(3.5,3){Plus}
\pnode(6.5,5){S}
\pnode(3.5,5){E}
% Dipole node connections
\resistor(D)(Minus){$R_2$}
\capacitor(E)(S){$C$}
\resistor[parallel,parallelarm=2](E)(S){$R_1$}
\OA[intensity](Minus)(Plus)(S)
% Wires
\wire(Minus)(E)
\wire(Plus)(B)
% Tensions
\tension(A)(D){$u_E$}
\makeatletter % (special tricks see below)
\tension(C)(S@@){$u_S$}
\tension[linecolor=blue](Plus@@)(Minus@@){$\epsilon$}
\makeatother
% Grounds
\ground(A)
\ground(B)
\ground(C)
\end{pspicture}
```



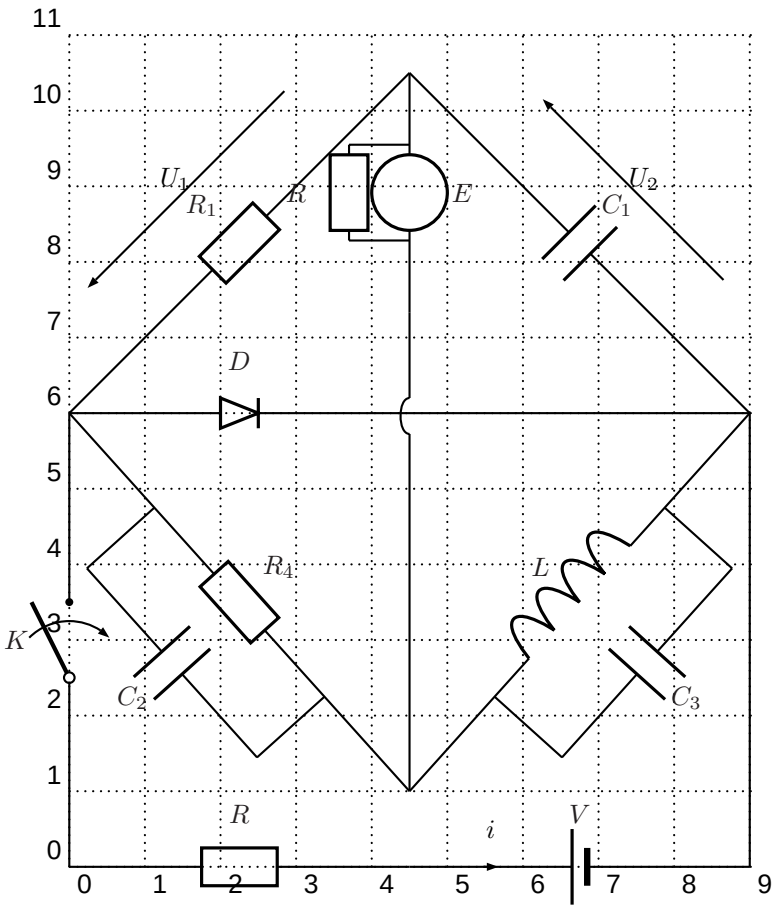

```
\begin{pspicture}(-1,0)(7,8)
\psgrid[subgriddiv=1,griddots=10]
% Node definitions
\pnode(1,1){A}
\pnode(1,7){B}
\pnode(3,1){C}
\pnode(3,7){D}
% Dipole node connections
\Ucc[tensionlabel=$E$](A)(B){}
\resistor(B)(D){$R$}
\coil(D)(C){$L$}
\capacitor[parallel,parallelarm=2.5](D)(C){$C$}
% Wire
\wire(A)(C)
\end{pspicture}
```




```
\begin{pspicture}(6,6)
\psgrid[subgriddiv=1,griddots=10]
% Node definitions
\pnode(0,3){A}
\pnode(3,3){B}
\pnode(6,3){C}
% Dipole node connections
\coil[intensitylabel=$i$](A)(B){$L$}
\coil[intensitylabel=$i'$,intensitycolor=green,%
  parallel,parallelarm=2](B)(C){$L'$}
\capacitor[parallel,parallelarm=-2](B)(C){$C$}
\end{pspicture}
```




```
\begin{pspicture}(6,6)
\psgrid[subgriddiv=1,griddots=10]
% Node definitions
\pnode(0,0){A}\pnode(6,0){B}
\pnode(0.3,4){Cprime}\pnode(5.7,4){Dprime}
\pnode(2.5,4){Gprime}\pnode(2.5,0){Hprime}
\pnode(0,4){C}\pnode(6,4){D}
\pnode(0.3,6){E}\pnode(5.7,6){F}
\pnode(4,6){G}\pnode(4,0){H}
\multidipole(G)(H)%
  \wire[intersect,
    intersectA=C,intersectB=D]
  \resistor{$R'_3$}.
\resistor(E)(G){$R'_1$}
\resistor(G)(F){$R'_2$}
\multidipole(C)(D)\resistor{$R_1$}%
  \wire\resistor{$R_2$}.
\wire(A)(B)\wire(Cprime)(E)
\wire(Dprime)(F)
\resistor(Hprime)(Gprime){$R_3$}
\end{pspicture}
```

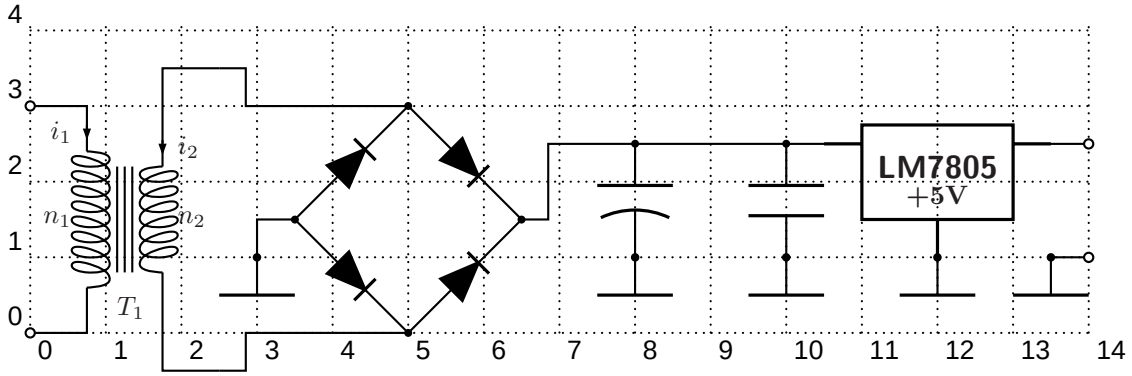



```
\begin{pspicture}(9,11)
\psgrid[subgriddiv=1,griddots=10]
% Node definitions
\pnode(0,0){A}
\pnode(9,0){B}
\pnode(0,6){C}
\pnode(9,6){D}
\pnode(4.5,1){E}
\pnode(4.5,10.5){F}
%
\switch(A)(C){$K$}
\multidipole(A)(B)\resistor{$R$}%
  \battery[intensitylabel=$i$]{$V$}.
\wire(B)(D)
\multidipole(C)(D)\diode{$D$}\wire.
\resistor[tensionlabel=$U_1$](C)(F){$R_1$}
\resistor(C)(E){$R_4$}
\capacitor[parallel,parallelarm=1.2,
  parallelsep=1.5](C)(E){$C_2$}
\coil(E)(D){$L$}
\capacitor[parallel,parallelarm=1.2,
  parallelsep=1.5](E)(D){$C_3$}
\capacitor[tensionlabel=$U_2$](F)(D){$C_1$}
\multidipole(E)(F)\wire%
  \wire[intersect,
  intersectA=C,intersectB=D]%
  \circledipole[labeloffset=-0.7]{$E$}%
  \resistor[parallel,
    parallelsep=.6,parallelarm=.8]{$R$}.
\end{pspicture}
```

The fellowing example was written by Manuel Luque.

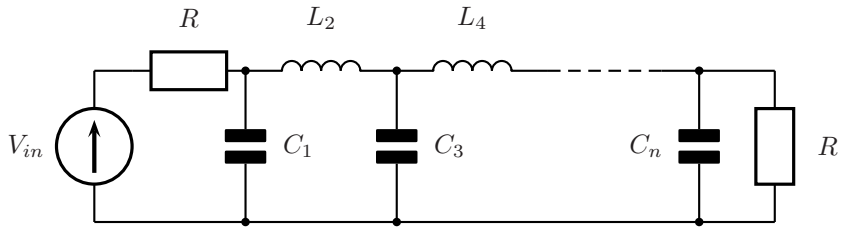
```
\begin{pspicture}(14,4)
\psgrid[subgriddiv=1,griddots=10]
\pnode(0,0){B}\pnode(0,3){A}
\pnode(2.5,3.5){C}\pnode(2.5,-0.5){D}
\pnode(5,3){E}\pnode(6.5,1.5){F}
\pnode(5,0){G}\pnode(3.5,1.5){H}
\pnode(8,2.5){I}\pnode(8,1){J}
\pnode(10,2.5){K}\pnode(10,1){L}
\pnode(14,2.5){M}\pnode(12,1){N}
\pnode(3,1){H'}\pnode(14,2.5){O}
\pnode(14,1){P}\pnode(13.5,1){Q}
\transformer[transformeriprimarylabel=$i_1$,
  transformerisecondarylabel=$i_2$,
  primarylabel=$n_1$,secondarylabel=$n_2$]%
  (A)(B)(C)(D){$T_1$}
{\psset{fillstyle=solid,fillcolor=black}
\diode(H)(E){}\diode(H)(G){}
\diode(E)(F){}\diode(G)(F){}}
\capacitor[dipolestyle=chemical](I)(J){}
\capacitor(K)(L){}
\REG(K)(M)(N)%
  {\shortstack{\textsf{%
  \textbf{\large LM7805}}\\\textbf{+5V}}}
\ncangle{I}{F}\psline(I)(K)
\ncangle{E}{C}\ncangle{G}{D}
\ncangle[arm=0]{P}{Q}
\ncangle[arm=0]{H}{H'}
\ground(H')\ground(J)
\ground(L)\ground(N)
\ground(Q)\qdisk(I){1.5pt}
```

```
\qdisk(K){1.5pt}\qdisk(E){1.5pt}
\qdisk(G){1.5pt}\qdisk(H){1.5pt}
\qdisk(F){1.5pt}
\pscircle[fillstyle=solid](A){0.075}
\pscircle[fillstyle=solid](B){0.075}
\pscircle[fillstyle=solid](P){0.075}
\pscircle[fillstyle=solid](O){0.075}
\end{pspicture}
```



The fellowing example was written by Lionel Cordesses.

```
\begin{pspicture}(11,3)
\psset{dipolestyle=elektor}
\pnode(1,2){Vin}\pnode(0.5,2){S}\pnode(0.5,0){Sm}
\pnode(2.5,2){A}\pnode(4.5,2){B}\pnode(6.5,2){C}
\pnode(8,2){Cd}\pnode(8.5,2){D}\pnode(9.5,2){E}
\pnode(2.5,0){Am}\pnode(4.5,0){Bm}\pnode(6.5,0){Cm}
\pnode(8.5,0){Dm}\pnode(9.5,0){Em}
\Ucc[labeloffset=0.9](Sm)(S){$V_{in}$}\resistor(Vin)(A){$R$}
\capacitor(A)(Am){$C_1$} \capacitor(B)(Bm){$C_3$}
\capacitor[labeloffset=-0.7](D)(Dm){$C_n$}\resistor(E)(Em){$R$}
\coil(A)(B){$L_2$}\coil(B)(C){$L_4$}
\wire(Am)(Bm)\wire(Bm)(Cm)\wire(Cm)(Dm)\wire(Dm)(Em)\wire(D)(E)
\wire(Cd)(D)\psline[linestyle=dashed](C)(Cd)
\wire(S)(Vin)\wire(Sm)(Am)
\pscircle*(D){2\pslinewidth} \pscircle*(Dm){2\pslinewidth}
\pscircle*(A){2\pslinewidth} \pscircle*(Am){2\pslinewidth}
\pscircle*(B){2\pslinewidth} \pscircle*(Bm){2\pslinewidth}
\end{pspicture}
```



6 Adding new components

Adding new components is not so simple. As a matter of fact, due to the complex mechanism of `\multidipole`, there are multiple steps. The easiest way to proceed is to draw the component, send it to me (`christophe.jorssen@noos.fr`) and I'll do the programming work regarding your component. Nevertheless, it can take a few time...

If you want to modify the code, you need to know the fellowing things. For a dipole, you need to define

```
\def\component_name{\@ifnextchar[{\pst@component_name}{\pst@component_name[]}}
%
\def\pst@component_name[#1](#2)(#3)#4{{%
  \pst@draw@dipole{#1}{#2}{#3}{#4}\pst@draw@component_name
```

```
  }\ignorespaces}
%
\def\pst@multidipole@component_name{\@ifnextchar[{\pst@multidipole@component_name@}%
  {\pst@multidipole@component_name@[]}}
%
\def\pst@multidipole@component_name@[#1]#2{%
  \expandafter\def\csname pst@circ@tmp@\number\pst@circ@count@iii\endcsname{#2}%
  {\setkeys{psset}{#1}%
  \ifPst@circ@parallel\aftergroup\advance\aftergroup\pst@circ@count@i\aftergroup\m@ne\fi}%
  \pst@circ@count@ii=\pst@circ@count@i%
  \advance\pst@circ@count@ii\@ne%
  \toks0\expandafter{\pst@multidipole@output}%
  \edef\pst@multidipole@output{%
    \the\toks0%
    \pst@multidipole@def@coor%
    \noexpand\component_name [#1]%
  (! X@\the\pst@circ@count@i\space Y@\the\pst@circ@count@i)%
  (! X@\the\pst@circ@count@ii\space Y@\the\pst@circ@count@ii)%
      {\noexpand\csname pst@circ@tmp@\number\pst@circ@count@iii\endcsname}%
  }%
  \pst@multidipole@
}
%
\def\pst@draw@component_name{%
  % The PSTricks code for your component
  % The center of the component is at (0,0)
  \pnode(component_left_end,0){dipole@1}
  \pnode(component_right_end,0){dipole@2}
}
```

Then, you have to make some changes in `\multidipole` core code... In the definition of `\pst@multidipole`, look for the last `\ifx` test

```
% ...
% Extract from \pst@multidipole
                      \else
                        \ifx\circledipole #4%
                          \let\next\pst@multidipole@circledipole
                        \else
                          \ifx\LED #4%
                            \let\next\pst@multidipole@LED
                          \else
                          % Put your modification here
                            \let\next\ignorespaces
                          \fi
                        \fi
                      \fi
% Extract form \pst@multidipole
% ...
```

and add (in red)

```
% ...
% Extract from \pst@multidipole
                      \else
                        \ifx\circledipole #4%
                          \let\next\pst@multidipole@circledipole
                        \else
                          \ifx\LED #4%
                            \let\next\pst@multidipole@LED
                          \else
                            \ifx\component_name #4%
                              \let\next\pst@multidipole@component_name
```

```
                        \else
                          \let\next\ignorespaces
                        \fi
                      \fi
                    \fi
                  \fi
% Extract form \pst@multidipole
% ...
```

Do the same in `\pst@multidipole@`

```
% ...
% Extract from \pst@multidipole@
                  \else
                    \ifx\circledipole #1%
                      \let\next\pst@multidipole@circledipole
                    \else
                      \ifx\LED #1%
                        \let\next\pst@multidipole@LED
                      \else
                        \ifx\component_name #1%
                          \let\next\pst@multidipole@component_name
                        \else
                          \let\next\ignorespaces
                          \pst@multidipole@output
                        \fi
                      \fi
                    \fi
                  \fi
% Extract form \pst@multidipole@
% ...
```

and that's it! All you have to do then is send your modified `pst-circ.tex` to me: it'll be part of the official release of **'pst-circ'**.

Important: Pay attention to the comment char `%` at the end of lines. They are *very* important in order to avoid spurious blanks.

7 Acknowledgements

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