

# Printing grids at the University of Southampton Print Centre - Using the 'High Quality' mode

October 30, 2017

The *nominal* printing modes are, depending on the printing quality selectable in the software:

'High' : H x V = 1058 x 902

'Fine Art' : H x V = 446 x 601

'Quality' : H x V = 446 x 451

'Express production' : H x V = 446 x 301

The former document (Oct 7) showed how to use the 'Quality' mode, at a real definition of 445.6825 x 451.

I run some other tests today with the highest resolution (nominal 1058 x 902).

Once again, some periodic defects appeared when using it. Using the formula indicated previously:

$$\Delta\text{DPI} = \pm \frac{d_0}{d}$$

where  $d$  is the defect period and  $d_0 = 25.4$  mm, it was possible to determine the actual definition :

1058.33867 x 902
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Notice that 902 is exactly twice 451, the vertical definition used with the 'quality' mode, where no adjustment had to be made. The ratio between the horizontal definitions of the 'high' and 'quality' modes is 2.37464713108547, not evoking anything sensible...

I had to amend once again the Postscript file, in order to be able to use a different number of points in the  $x$  and  $y$  directions, to achieve a grid with similar periods along the two directions. Fortunately, a 6/7 ratio works almost perfectly:

- 14 points @ 1058.33867 DPI (H) = 0.335998 mm
- 12 points @ 902 DPI (V) = 0.337916 mm

I also ask for **black enhancement**: the solution is simply to print the grid twice.

It was possible to print a fairly decent 0.336 mm grid. I tried to halve the period (only possibility to keep the 6/7 ratio), but the result was rather poor (too many deviations of the dots from their ideal location).

```

%!PS-Adobe-2.0
%%Creator: Yves Surrel
%%Title: Grille A4 10 t/cm
%%Pages: 1
%%BoundingBox: 0 0 595 842
%%DocumentPaperSizes: A4
%%EndComments
%%BeginProlog
/GrilleDict 50 dict def
/str 20 string def

/fraction 72. def

GrilleDict begin
/cm % (S longueur_en_cm -- longueur_en_points )
{
    2.54 div fraction mul
} bind def

/printer_pt_to_PSptH { 1.0 resolutionH div fraction mul mul } bind def
/printer_pt_to_PSptV { 1.0 resolutionV div fraction mul mul } bind def

/pt_size_cmH { 2.54 resolutionH div } bind def
/pt_size_cmV { 2.54 resolutionV div } bind def

/half_pt_size_cmH { 1.27 resolutionH div } bind def
/half_pt_size_cmV { 1.27 resolutionV div } bind def

/adjustH % ( size_cm -- )
% Convertit size_cm en une longueur en cm
% correspondant à un nombre demi-entier de points de résolution
{
    pt_size_cmH div round pt_size_cmH mul % half_pt_size_cm add
} bind def

/adjustV % ( size_cm -- )
% Convertit size_cm en une longueur en cm
% correspondant à un nombre demi-entier de points de résolution
{
    pt_size_cmV div round pt_size_cmV mul % half_pt_size_cm add
} bind def

/PasH 0 def
/PasV 0 def
/Hauteur 0 def
/Largeur 0 def

/Negatif? false def
/Positif { /Negatif? false def } bind def
/Negatif { /Negatif? true def } bind def

/PrepareCouleur
{
    Negatif?
    {
        0 setcolor
        currentpoint Largeur Hauteur rectfill
        1 setcolor
    }
    {
        1 setcolor
        currentpoint Largeur Hauteur rectfill
        0 setcolor
    } ifelse
} bind def

```

```

/$GrilleVerticale % (S -- )
{
    PasH 2 div setlinewidth
    Largeur PasH div ceiling cvi 1 add
    {
        currentpoint
        0 Hauteur PasH div ceiling PasH mul rlineto
        exch PasH add exch moveto
    } repeat
    stroke
} bind def

/$GrilleHorizontale % ( -- )
{
    PasV 2 div setlinewidth
    currentlinewidth -2 div 0 rmoveto
    Hauteur PasV div ceiling cvi 1 add
    {
        currentpoint
        Largeur PasV div ceiling PasV mul currentlinewidth add 0 rlineto
        PasV add moveto
    } repeat
    stroke
} bind def

/Titre
{
    /Courier findfont 9 scalefont setfont
    0 -20 rmoveto
    (p_x = ) show
    PasH 72 div 25.4 mul str cvs show
    ( mm \() show
    pts_per_periodH str cvs show
    ( pts\); p_y = ) show
    PasV 72 div 25.4 mul str cvs show
    ( mm \() show
    pts_per_periodV str cvs show
    ( pts\); DPI = ) show
    resolutionH str cvs show
    ( (x) ) show
    resolutionV str cvs show
    ( (y)) show
} bind def

/GrilleVerticale % (S x y -- )
{
    /Hauteur exch def
    /Largeur exch def
    pts_per_periodV printer_pt_to_PSptV /PasV exch def
    gsave
    PrepareCouleur
    $GrilleVerticale
    grestore 0 setcolor Titre
} bind def

/GrilleHorizontale % (S x y -- )
{
    /Hauteur exch def
    /Largeur exch def
    pts_per_periodH printer_pt_to_PSptH /PasH exch def
    gsave
    PrepareCouleur
    $GrilleHorizontale
    grestore 0 setcolor Titre
} bind def

```

```

/GrilleCroisee % (S x y -- )
{
    /Hauteur exch def
    /Largeur exch def
    pts_per_periodH printer_pt_to_PSptH /PasH exch def
    pts_per_periodV printer_pt_to_PSptV /PasV exch def
    gsave
    PrepareCouleur
    gsave
    $GrilleVerticale
    grestore
    $GrilleHorizontale
    grestore 0 setcolor Titre
} bind def
end
%%EndProlog

%%BeginSetup
GrilleDict begin
%%BeginPaperSize: A4
%%EndPaperSize

%%Page: 1 1
a4

/resolutionH 1058 0.33867 add def
/resolutionV 902 def
/pts_per_periodH 14 def
/pts_per_periodV 12 def

1 adjustH cm 1.7 adjustV cm moveto
gsave
Negatif

19 cm 27.5 cm GrilleCroisee
grestore

% 1 cm 1.5 cm moveto
% 9.4 cm 13.4 cm rmoveto
% 1 setcolor
% currentpoint Pas Pas rectfill
% 0 setcolor
% stroke

showpage
end
%%EOF

```

The caption at the bottom of the printed grid has also been changed. With the listed file, the printed caption is:

```

p_x = 0.335998 mm (14 pts); p_y = 0.337916 mm (12 pts); DPI = 1058.34 (x) 902 (y)

```