

The Lowdown on the `\X'ps: import ...'` Transformation

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The in-text command

```
\X' ps: import file llx lly urx urw des_wid [des_ht]
```

(where llx , lly , urx , ury are given in points; des_wid and the **optional** des_ht are given in points $\times 1,000$) places the PS graphic defined by the EPS file $file$ on the page according to the following specification. If des_ht is not given explicitly, it is calculated internally (see below).

Suppose the graphic in $file$ has **true** BoundingBox

LLX LLY URX URY

(as opposed to anything the `%%BoundingBox:` line may say; or this is as from the `%%BoundingBox:` line but we want to use different llx lly urx and ury — the point is that `\X' ps: import'` does not look at the BBox line, so you can take the “bottom left hand corner” (BLHC) of your graphic where you like in terms of the coordinates used in the EPS file; and this is what is meant by *LLX* and *LLY*. Similarly for *URX* and *URY*.)

A point with graphic coordinates (X, Y) relative to the BLHC has EPS-file coordinates $(LLX + X, LLY + Y)$. This point (X, Y) plots at

$$(LLX - llx + X) \times \frac{des_wid}{urx - llx}, \quad (LLY - lly + Y) \times \frac{-des_ht}{ury - lly}.$$

relative to the page position which is current (`'currentpoint'`) at the point in the output where `\X' ps: import ...'` is encountered.

Thus the bottom left-hand corner (LLX, LLY) of the graphic goes at

$$(LLX - llx) \times \frac{des_wid}{urx - llx}, \quad (LLY - lly) \times \frac{-des_ht}{ury - lly}. \quad (*)$$

and the top right-hand corner (URX, URY) of the graphic goes at

$$(URX - llx) \times \frac{des_wid}{urx - llx}, \quad (URY - lly) \times \frac{-des_ht}{ury - lly}. \quad (**)$$

relative to the current page position (`'currentpoint'`).

If the optional des_ht is not given, it is calculated internally as

$$des_ht = des_wid \times \frac{ury - lly}{urx - llx}$$

so that for the vertical scaling factor we have

$$\frac{-des_ht}{ury - lly} = -des_wid \times \frac{ury - lly}{urx - llx} \times \frac{1}{ury - lly} = \frac{-des_wid}{urx - llx},$$

and therefore the horizontal and vertical scaling factors are the same when des_ht is not given.