See original or copy: http://web.me.com/klaus.richter/ME35/ME35L0NA.TXT /.PS
Technical information: http://www.ps.bam.de or http://130.149.60.45/~farbmetrik

PSL2-program code: raster cell threshold data (24 × 24, 8 bit, horizontal)

```
%!PS-Adobe-3.0 B7211-7n.eps mit h24n721.for, 20.10.94
%%BoundingBox: 72 90 226 204
/FS {findfont exch scalefont setfont} bind def
/MM {72 25.4 div mul} def /str {8 string } bind def
/languagelevel where {pop languagelevel} {1} ifelse
2 ge {[/HalftoneType 3 /Width 24 /Height 24 /Thresholds
<F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0
 E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0
 D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0
 C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0
 B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0
 A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0
 9090909090909090909090909090909090909090909090
 8080808080808080808080808080808080808080808080
 6060606060606060606060606060606060606060606060
 4040404040404040404040404040404040404040404040
 3030303030202020101010101010202020303030303030
 3030303030202020101010101010202020303030303030
 3030303030202020101010101010202020303030303030
 3030303030202020101010101010202020303030303030
 3030303030202020101010101010202020303030303030
 5050505050505050505050505050505050505050505050
 7070707070707070707070707070707070707070707070
 9090909090909090909090909090909090909090909090
 A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0A0
 B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0
 C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0C0
 D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0D0
 E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0
 F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0F0>
 counttomark 2 idiv dup dict begin {def} repeat
 pop currentdict end sethalftone} if %def.Dictionary
%%EndProlog

72 90 translate 0.01  MM dup scale 15 setlinewidth
0 0  moveto 5400 0 rlineto 0 4000 rlineto
           -5400 0 rlineto closepath stroke
/xyw {4000 24 div} bind def /xw {16 xyw mul} bind def
/x0 {8 xyw mul} bind def /y0 {5 xyw mul} bind def
0 1 15 {dup 0.0666 mul 1 exch sub setgray
        xyw mul y0 add x0 exch moveto
        xw 0 rlineto 0 xyw rlineto
        xw neg 0 rlineto closepath fill} for
200 /Times-ISOL1 FS 0 setgray /D16str (0123456789ABCDEF) def
0 1 15 {/nr exch def nr xyw mul y0 add x0 250 sub exch
        moveto D16str nr 1 getinterval show} for

 xyw 3.5 xyw mul moveto
(<</HalftoneType 3 /Width 24 /Height 24 /Thresholds) show
 xyw 2.0 xyw mul moveto
(%in middle 7 × 5 "10", 13 × 5 "20", 24 × 5 "30", etc.) show
 xyw 0.5 xyw mul moveto
(>> sethalftone %<<, >> see PSL2 hand book, page 361) show
showpage
```

ME350-7, B8_29

digital image processing with *Adobe PostScript Level 2* CIEBased*ABC*-color space

The *ABC*-color data represent zone theory of colorvision in two non linear steps:

1. non linear trichromatic step
2. non linear opponent color step

ME351-1, B8_33_1

CIE 1931 *XYZ*-color space in PSL2

```
[/CIEBasedABC<<   %Dict PostScript Level 2
  /MatrixABC [1 0 0 0 1 0 0 0 1]  %default
  /DecodeABC [{} {} {}] %default, empty function
  /RangeABC [ 0 0.9505 0 1 0 1.0890] %D65
  /MatrixLMN [1 0 0 0 1 0 0 0 1]  %default
  /DecodeLMN [{} {} {}] %default, empty function
  /RangeLMN [ 0 0.9505 0 1 0 1.0890] %D65
  /WhitePoint [0.9505 1 1.0890] %D65
  /BlackPoint [0 0 0] % default
>>]setcolorspace
```

ME351-3, B8_33_3

EBU-*RGB**-color space in PSL2

```
[/CIEBasedABC<<   %Dict PostScript Level 2
  /MatrixABC [1 0 0 0 1 0 0 0 1]  %default
  /DecodeABC [{} {} {}] %default, empty function
  /RangeABC [ 0 0.9505 0 1 0 1.0890] %D65
  /MatrixLMN [0.4303 0.2219 0.0202 0.3416
        0.6720 0.1412 0.1845 0.0833 0.9227]
  /DecodeLMN [{2.2 exp} {2.2 exp} {2.2 exp}]
  /RangeLMN [ 0 0.9505 0 1 0 1.0890] %D65
  /WhitePoint [0.9505 1 1.0890] %D65
  /BlackPoint [0 0 0] % default
>>]setcolorspace
```

ME351-5, B8_34_2

CIELAB 1976 *L*a*b**-color space definition and reversal

$$L^* = 116\,(Y/Y_n)^{1/3} - 16$$
$$a^* = 500\,[\,(X/X_n)^{1/3} - (Y/Y_n)^{1/3}\,]$$
$$b^* = 200\,[\,(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}\,]$$

$$X = X_n\,[\,(L^* + 16)/116 + a^*/500\,]^3$$
$$Y = Y_n\,[\,(L^* + 16)/116\,]^3$$
$$Z = Z_n\,[\,(L^* + 16)/116 - b^*/200\,]^3$$

ME351-7, B8_35_1

CIEBased*ABC*-color space in PSL2 transformation *ABC* -> XYZ* three colorness -> tristimulus values

$$\begin{pmatrix} L^* \\ M^* \\ N^* \end{pmatrix} = \begin{pmatrix} 3 \times 3 \\ \text{Matrix}ABC \end{pmatrix} \times \begin{pmatrix} D(A^*) \\ D(B^*) \\ D(C^*) \end{pmatrix}$$

$$\begin{pmatrix} X \\ Y \\ Z \end{pmatrix} = \begin{pmatrix} 3 \times 3 \\ \text{Matrix}LMN \end{pmatrix} \times \begin{pmatrix} D(L^*) \\ D(M^*) \\ D(N^*) \end{pmatrix}$$

ME351-2, B8_33_2

CIEBased*ABC*-color space in PSL2 *LMN* / OLV* / RGB* -> XYZ* EBU-screen phosphors, D65

$$L = \text{Decode}L^* = \{2.2\ \text{exp}\}$$
$$M = \text{Decode}M^* = \{2.2\ \text{exp}\}$$
$$N = \text{Decode}N^* = \{2.2\ \text{exp}\}$$

$$\begin{pmatrix} X \\ Y \\ Z \end{pmatrix} = \begin{pmatrix} 0{,}4303 & 0{,}3416 & 0{,}1782 \\ 0{,}2219 & 0{,}7068 & 0{,}0713 \\ 0{,}0202 & 0{,}1296 & 0{,}9387 \end{pmatrix} \times \begin{pmatrix} L \\ M \\ N \end{pmatrix}$$

ME351-4, B8_34_1

CIEBased*ABC*-color space in PSL2 *LMN* / OLV* / RGB* -> XYZ* NTSC-screen phosphors, D65

$$L = \text{Decode}L^* = \{1.8\ \text{exp}\}$$
$$M = \text{Decode}M^* = \{1.8\ \text{exp}\}$$
$$N = \text{Decode}N^* = \{1.8\ \text{exp}\}$$

$$\begin{pmatrix} X \\ Y \\ Z \end{pmatrix} = \begin{pmatrix} 0{,}4497 & 0{,}3163 & 0{,}1845 \\ 0{,}2446 & 0{,}6720 & 0{,}0833 \\ 0{,}0252 & 0{,}1412 & 0{,}9227 \end{pmatrix} \times \begin{pmatrix} L \\ M \\ N \end{pmatrix}$$

ME351-6, B8_34_3

CIELAB 1976 *L*a*b**-color space and CIEBased*ABC*-transformation

$$X = X_n\,[\,(L^* + 16)/116 + a^*/500\,]^3$$
$$Y = Y_n\,[\,(L^* + 16)/116\,]^3$$
$$Z = Z_n\,[\,(L^* + 16)/116 - b^*/200\,]^3$$

$$A = \text{Decode}L^* = \{16\ \text{add}\ 116\ \text{div}\}$$
$$B = \text{Decode}a^* = \{500\ \text{div}\}$$
$$C = \text{Decode}b^* = \{200\ \text{div}\}$$

ME351-8, B8_35_2

TUB registration: 20101101-ME35/ME35L0NA.TXT /.PS
application for measurement of printer or monitor systems
TUB material: code=rha4ta