

AESTHEDES DESIGN WORKSTATION SOFTWARE RELEASE
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This manual consists of three major chapters :

- Chapter I : Plotter emulation : Interface with CAD software packages
- Chapter II : Background processing : processes executed in background
- Chapter III : Text editing
- Appendix I : Colour Correction
- Appendix II : ASCII - table

Note : This manual contains information on certain functions which are optional. Details on these equipment options can be obtained upon requiry.

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CHAPTER 1 : PLOT EMULATION1. INTRODUCTION

Option-key 4 will start up the plotter-emulation-program. The right hand b/w monitor will display the emulation menu :

```
PLOT EMULATION MENU
Plotters supported
HP = 1   TA 10 = 6
```

```
Select plotter type .....< 1 >
```

Files, created on PC using any kind of CAD-software package, provided the software package generates HP-GL or TA 10-codes and comm. via RS232 and Xon-Xoff, can be transferred to the Aesthedes Workstation.

Interfaced with a personal computer, the Aesthedes Workstation imitates and acts as a plotter.

Once the files have been transmitted and are stored on the Aesthedes harddisk, the designer can modify, complete or even combine his creations, using the wide range of features, available on the Aesthedes Workstation.

In this manual, the interface with two CAD-software packages will be treated rather extensively and separately : Lasercomb "BOX-CAD" Interact (packaging design) and Autocad (general design and drafting software package). Nevertheless, it remains possible to interface other CAD-packages as well, as long as they generate HP-GL or TA-10 codes.

2. OPERATING INSTRUCTIONS

2.1. Lasercomb-"BOX-CAD"-Interact

2.1.1. Introduction

Packaging design is one of the many application areas of the Aesthedes Graphic Design Workstation. The interface that has been realized between the Lasercomb-"BOX-CAD" Interact system and the Aesthedes Graphic Design Workstation allows the operator to work out the carton-layout on the Lasercomb-system, transmit the file and create the packaging design on the Aesthedes Workstation.

2.1.2. Hardware requirements

A. Aesthedes-Lasercomb-interface without intermediate PC

- The Lasercomb - system has to be connected by means of an RS-232-cable to port 0 at the back of the Aesthedes Graphic Design Workstation.
- Configuration of the asynchronous serial port of the Lasercomb-system :
 - 9600 baud
 - no parity
 - 8 databits
 - 1 stopbit
- In the RS-232-cable, only lines 2, 3 and 7 have to be connected. It might be necessary to twist lines 2 and 3. (DCE and DTE-conventions)
- The X-on/X-off datacommunication protocol has to be installed in the Lasercomb-system.

B. Aesthedes-Lasercomb-interface with intermediate PC or protocol convertor.

Remark : As long as the X-on/X-off data communication protocol has not been installed on the Lasercomb-system, it is necessary to bring in an IBM-PC or compatible PC.

- The Lasercomb file will be sent to the IBM-PC or protocol convertor, using hardwire-handshake.

- Actual transmission is executed in X-on/X-off mode, via a terminal program that runs on the intermediate PC. When a protocol convertor is used, transferring and receiving are carried out simultaneously.

Configuration of the serial port of the IBM-PC (or compatible) :

```
9600 baud
no parity
8 databits
1 stopbit
```

Practically, this configuration is as follows :

```
MOD COM1:9600,n,8,1,p
```

Remark : It is necessary to use two serial interfaces in this configuration : one to receive data from Lasercomb, another to send data to Aesthedes.

2.1.3. Proceeding

A. Preparation of the Aesthedes Workstation

```
PLOT EMULATION MENU
```

```
Plotters supported :
```

```
HP : 1
```

```
TA 10 : 6
```

```
Select plotter type .....<1>
```

Selection will be determined by the codes that are generated by the CAD-package. In general, Lasercomb will generate HP-GL-codes, although, by means of a user written interface, it can also generate TA-10 codes.

```
Change stop condition .....<N>
```

A stop condition is a number of plotter commands, sent at the end of a plotter file.

It is used by the emulation program to recognize the end of the transmitted file.

The usage of various CAD-packages (with different plotter support) can enforce the operator to change the stopcondition. The plotter type selection implies the choice of the corresponding stopcondition, which has been set in the emulation program.

Once the condition has been altered, the initial setting is removed and should, if needed, be set again. Beware of the fact that the (new) stop condition has to be set in hexadecimal form, separated by full stops.

The setting : HP - emulation : (PA 0,0;)
 hexadecimal : 50.41.30.2C.30.3B
 TA-10 emulation : (U 0,0)
 hexadecimal : 55.30.2C.30
 cfr. Appendix II : ASCII table

If the stop condition needs to be changed :

Change stop condition <N> Y
 Act (hex) <50.41.30.2C.30.3b>
 New < >

Plot offset x direction <-15000>
 Plot offset y direction <-15000>

Offset values have to be set to position the transferred creation on the Aesthedes-screen.

As the origin (or (0,0)-coordinates) is situated in the middle of the Aesthedes-screen, negative offsets have to be entered (e.g. -15000, -15000) to position a creation's origin in the lower left corner. (When the plotter's origin is (0,0)). The values of the offsets are dependant on the creation and its sizes. It might need some tests to point out the exact variables.

Remark : If "nothing" is being displayed on the Aesthedes-screen, the plot offset values possibly are too high.

Scale factor<0.200000 >

Scale factor enlarges or reduces the original creation. Beware that, if you enter a negative scale factor, the creation will be positioned, reversed to the origin.

Remark : If only disorganized and irregular shapes or lines appear on the Aesthedes-screen, the scale factor probably was too high.

CAD software supported
 GENERAL : 1 AUTOCAD : 2 LASERCOMB : 3

Select CAD packet<3>

Filename to store< >

Filename used to store the transmitted file on harddisk

Remark : Beware as there is no check on duplicate filenames.

Cancel emulation< N >

Up to this point, it remains possible to cancel the action. The preparation of the Aesthedes Workstation will be completed by a last carriage return. At this moment, the Aesthedes "turns into" a plotter emulator and is ready to accept data.

B. Preparation of Lasercomb-system

* Without an intermediate PC or protocol convertor :

Prepare the Lasercomb-system in the same way as if an arbitrary file needed to be plotted. Transmission to the Aesthedes Workstation starts only then, when the <ENTER> key of the Lasercomb-system is pressed.

* With an intermediate PC or protocol convertor :

Lasercomb files have to be transferred to the IBM-PC and stored on the IBM's harddisk.

Start up the Xon-Xoff terminal program and follow its instructions.

Transmission to the Aesthedes Workstation starts only then, when the <ENTER> key of the IBM-PC is pressed.

C. Actual transmission

Transmission of the Lasercomb-files to the Aesthedes Workstation will actually start as soon as the <ENTER> key of the Lasercomb system or IBM-PC is pressed.

On the right hand black/white monitor, a dotted line will be displayed as long as the transmission goes on.

The remark **Plot emulation finished** indicates the completion of the transfer.

As the transmitted files are stored on the harddisk of the Aesthedes Workstation, these files must be read from harddisk to be displayed on the Aesthedes Workstation.

2.2. Autocad

2.2.1. Introduction

Autocad is a general design and drafting software package that runs on different PC and workstation systems.

2.2.2. Hardware requirements

- The Autocad software package has to be installed on the IBM-PC or compatible computer.
- An RS-232 serial line has to be connected to port 0 at the back of the Aesthedes Workstation.
- In the RS-232-cable, only lines 2, 3 and 7 have to be connected. It might be necessary to twist lines 2 and 3. (DCE and DTE-conventions)
- Autocad configures the serial port as :

```

9600 baud
even parity
7 databits
2 stopbits

```

and uses the Xon - Xoff protocol for sending and receiving.

2.2.3. Proceeding

A. Preparation of the Aesthedes Workstation

PLOT EMULATION MENU

Plotters supported :

HP : 1

TA 10 : 6

Select plotter type

<1>

X
The preparation of the Aesthedes Workstation to accept drawings and designs, generated by Autocad is exactly the same as the preparation of the workstation for the Lasercomb-drawings. Except for the CAD-software package being used, there is no difference at all.

See previous pages.

B. Preparation of the PC with Autocad

Prepare the "Autocad-system" in the same way as if an Autocad-file needed to be plotted. Beware that the Aesthedes-Workstation is in "plot emulation mode" (ready to accept data).

C. Actual transmission

Transmission of Autocad-files to the Aesthedes Graphic Design Workstation starts as soon as the <ENTER>-key of the PC with the Autocad-program is pressed.

On the right hand black/white monitor, a dotted line will be displayed as long as the transmission goes on.

The remark **Plot emulation finished** indicates the completion of the transfer.

As the transmitted files are stored on the harddisk of the Aesthedes Workstation, these files must be read from hard-disk to be displayed on the Aesthedes Workstation.

CHAPTER 2 : BACKGROUND PROCESSING

By means of option key 5, the background processing menu will be displayed on the right hand b/w monitor.

BACKGROUND PROCESSING

1. Rasterize
2. Output to device
3. Inputscanner
4. Status
5. Task file menu
6. Start task file
7. Stop task file
8. Status of task file
9. Plotter
80. Installation software
99. Quit

Each of the above listed processes (except for 80 and 99 which are not real 'processes') can be executed in "background". This means that, while processing, the system still remains at the operator's disposal, which implies a considerable gain in time. The operator can simply continue his designing.

It is advised to quit the background processing menu as soon as one of the processes has been started, in order to accelerate the processing time.

1. RASTERIZE

1.1. Introduction

The Aesthedes Graphic Design Workstation offers its users the possibility to work with two types of images: vector images as well as framebuffer images (vector images contain vector data and framebuffer images contain pixel data). Images, for output on a thermal transfer printer or a slide recorder are composed of pixel data.

This implies that a conversion of vector data into pixel data (raster data) is necessary before an output can be generated. (It is obvious that only vector files and no framebuffer files need to be rastered).

This conversion is called "the raster process".

As both the QCR/PCR slide recorder and the thermal transfer printers have their own data formats, it is necessary to raster the desired vector files in the appropriate way.

In practice, this implies that a vectorfile that has been rastered for output on a thermal transfer printer, needs to be rastered once again for an output to PCR/QCR.

Remarks : - Before a file can be rastered, it has to be available on harddisk.
 - As soon as a vectorfile is rastered, it will automatically be stored on harddisk. The rasterfile will be indicated by the prefix "r."
 e.g. : DESIGN --> R.DESIGN

1.2. Operating instructions

A. Rasterfile NOT for the PCR/QCR (Versatec data format)

File to be rastered : < >

Name of the file that has to be rastered.

Rasterfile for the PCR ? (Y/N) :

Choice between PCR/QCR (slide recorder) or Versatec (thermal transfer printer) has to be made at this stage.

Raster size : Definition of the outputsize

1. Magnification factor
2. User defined

For vector files, both methods can be used to define the outputsize. For a framebuffer file, or the combination framebuffer file with a vector file, it is advisable to use the magnification factor. [Size of framebuffer image is always 512 x 512 pixels].

Choice 1

Magnification factor (1 ... 64) : < 6 >

The magnification factor is the multiple of 512 x 512 pixels framebuffer size to the output, which means that this magnification factor determines the number of times the output is going to be larger than 512 x 512 pixels.

To fit an A3 page it is advisable to use magnification factor 6.

As soon as all parameters have been entered, a parameter survey will be displayed, which leaves the user the opportunity to change the variables up to the last moment.

RASTERIZER

Rasterfile :
 Rasterfile NOT for PCR :
 Magnification factor :

Correctly specified (Y,N) : <Y>

When all parameters have been correctly specified, just press the <enter> key and the rasterizing process starts in background.

Choice 2

user defined

The user gets the opportunity to enter new parameters to define different output sizes.

Horizontal outputsize (mm) : <260.000000>

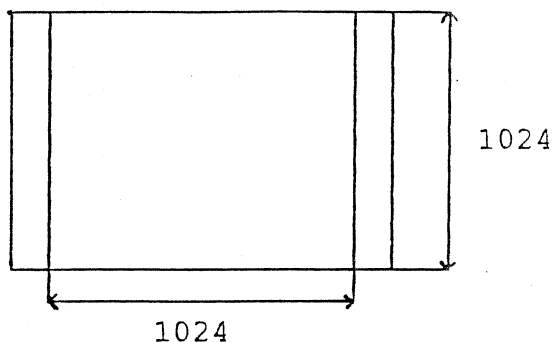
Dimension of the image, produced on the Versatec thermal transfer printer.

Remark : To define the real sizes of an image very accurately, it is necessary to calculate the relation between the Aesthedes-size (1024 x 1024 square) and the design.

Resolution (pixels/mm) <11.810000>

The resolution of the thermal transfer printer is fixed at 11.81 (300 dpi) and should not be changed.

Screen size (units) : <1024.000000>



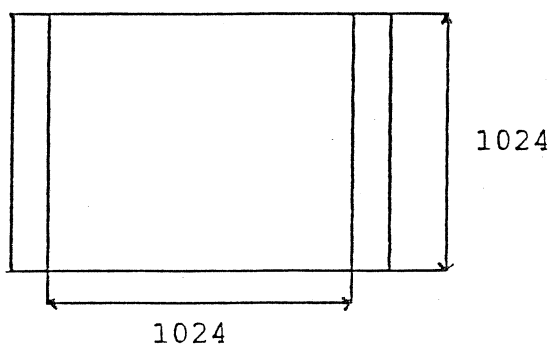
1024 is the default value.

Remark : To verify if the screen size is default (1024) measure the side of a polygon 6. It should be exactly 100.

Picture size (units) : <1024.000000>

Size of picture that has to be rastered. The relation between the screen size and the picture size is important. Two examples to explain :

1. Screen size : 1024
Picture size : 1024
The relation screen-size/picture-size = 1, i.e. the complete image will be rastered.
2. Screen size : 1024
Picture size : 512
In this case, only a quarter of the "screen" will be rastered.



As soon as all parameters have been entered, a parameter overview will be displayed, which leaves the user the opportunity to change the variables up to the last moment.

 RASTERIZER

Rasterfile :
 Raster NOT for PCR :
 Horizontal outputsize (mm) :
 Resolution (pixels/mm) :
 Screen size (units) :
 Picture size (units) :

Correctly specified (Y, N) : <Y>

If there are no changes to be made, just press the <enter> key and the raster process will start in background.

Remark : Once the rasterizing has started, it is advisable to leave the background processing menu.
 It will speed up the process considerably.

B. Rasterfile for the PCR (PCR/QCR data format)

In combination with framebuffer (Y, N) : <N>

Choice 1 : Not in combination with framebuffer

Camera type
 1. 35 mm
 2. 4 x 5
 3. 8 x 10

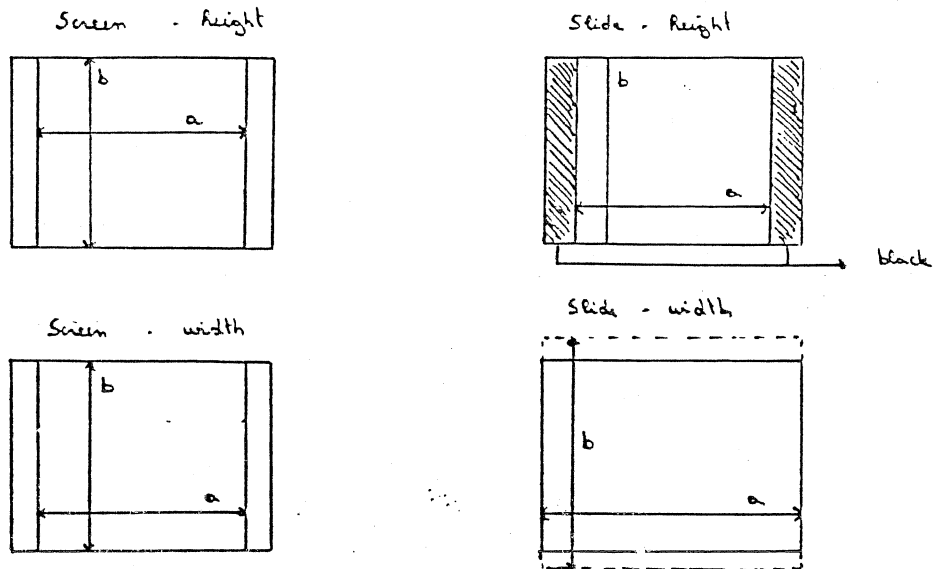
Your choice : <1>

As the PCR slide recorder only functions with a 35 mm camera, the default value does not need to be changed.

Full screen :
 1. height
 2. width

Your choice : <2>

In "height" mode, the whole screen will be rastered. The "width" mode only rasters a band in the middle of the design. The top and bottom of the design will not be rastered (black bands on slide output).



Remark : To make high, narrow figures more "screen filling", it might be interesting to choose the width mode instead of the height mode and rotate the picture 90°.

Screen resolution

1. 2K
2. 4K

Your choice : <2>

The PCR/QCR slide recorder generates slides with a resolution of 2000 or 4000 lines (2K/4K). The Aesthedes screen, however, has the video resolution of 512 x 512.

As a consequence, it is possible that lines, which are clearly visible on the Aesthedes screen, are not (or hardly) visible on the slide. To solve such a problem, it is advisable either to use the 2K-resolution, or to use "double" lines in the design.

As soon as all parameters have been entered, a parameter overview will be displayed, which leaves the user the opportunity to change the variables up to the last moment.

 RASTERIZER

```

Rasterfile           :
Rasterfile for the PCR
NOT in combination with framebuffer
Cameratype           :
Screen mode           :
Screen resolution     :
  
```

Correctly specified (Y, N) : <Y>

If there are no changes to be made, just press the <enter>-key and the raster process will start in background.

Choice 2 : In combination with framebuffer.

"The magnification factor" is the only parameter added to the "Rasterfile for PCR-menu".
 (compared with : NOT in combination with framebuffer : see pages 2.5 and 2.6)

Magnification factor (1...64)

The magnification factor signifies the times the user wants to have the 512 x 512 pixel framebuffer size to be enlarged on the output.

It is advised to enter magnification factor 5, if previously, height mode has been chosen, and magnification factor 8, if previously width mode has been chosen.

And again, an overview of all the parameters will be displayed, to give the operator still a last chance to change, the variables.

 RASTERIZER

```

Rasterfile           :
Rasterfile for the PCR
In combination with framebuffer
Cameratype           :
Screen mode           :
Screen resolution     :
Magnification factor  :
  
```

Correctly specified (Y, N) : <Y>

It is sufficient to press the <enter> key to start up the raster process in background.

2. Output to device

2.1. Introduction

As soon as the vectorfiles have been rastered in the appropriate dataformat (framebuffer files do not need to be rastered), it is possible to output vector files, framebuffer files or vector files combined with framebuffer files on a Versatec thermal transfer printer or a QCR/PCR slide recorder. The Versatec thermal transfer printer is a versatile thermal printer that can output A3 as well as A4 paper format. Furthermore, it offers the opportunity to work with 3 or 4 colours (dependant on the ink roller that has been installed in the printer). The PCR/QCR-slide recorder is a bench-top colour film recorder designed to produce slides.

2.2. Operating Instructions

Output devices :

1. QCR/PCR
 2. Versatec A4 3 colours
 3. Versatec A4 4 colours
 4. Versatec A3 3 colours
 5. Versatec A3 4 colours
 6. D-scan
- Your choice : <5>

2.2.1. QCR/PCR

Remark : Ensure the QCR/PCR slide recorder is connected with the Aesthedes Workstation by means of an IEEE-link.

A. Vector files

Name of raster file : < >

Enter the name of the rasterfile that has to be output. The name of a raster file always has the prefix "r."

Name of framebuffer file : < >

This parameter does not need to be filled out.

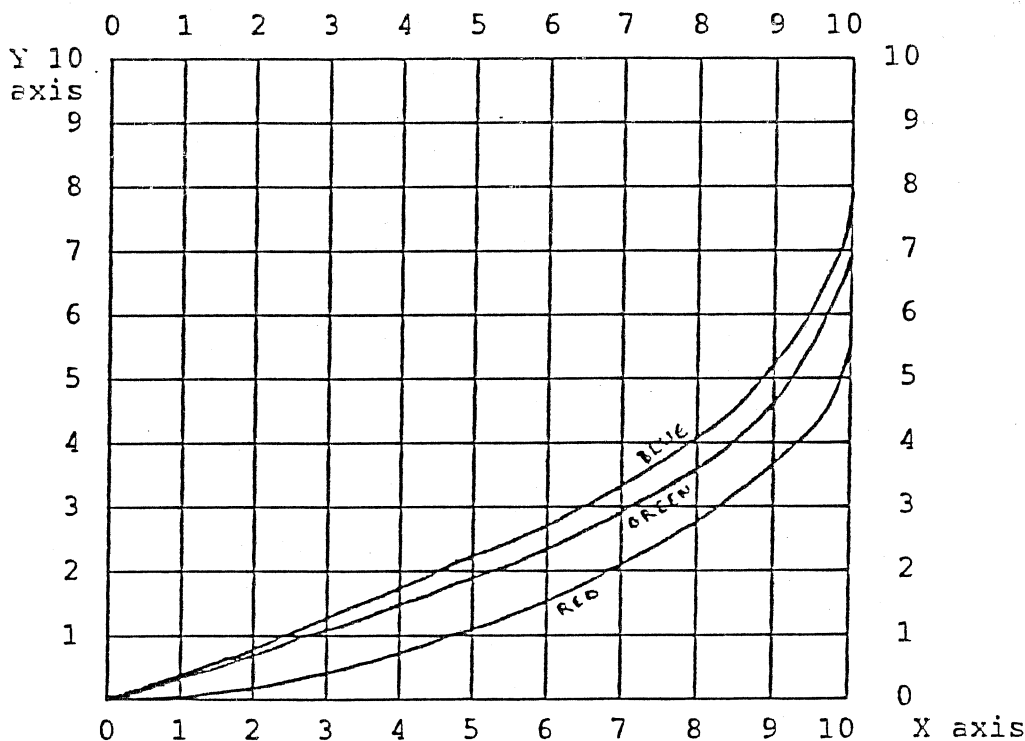
Name of look-up file : < >

A look-up file contains the graphic representation of the RGB-colour intensity values of a design on the Aesthedes Workstation (X-axis) and the corresponding colour values on the QCR/PCR slide recorder film (Y-axis).

By means of the look-up file, which has to be available on harddisk, the user has the opportunity to correct or modify colour values (e.g. because of the film type). It is possible for the user to build up an "own" look-up file or to modify a "standard" look-up file. Experiments will point out which RGB values are best suited. All Aesthedes operational features are to the user's disposal for modifications of the curves.

In case, no look-up file is being entered by the user, automatically the default look-up table, present in QCR/PCR, will be used. (For PCR, the look-up table appropriates for Ektachroom 100. For QCR, the look-up table appropriates for Polaroid type 559)

Example of a standard look-up file :



e.g. R : 50 % red on Ae --> \pm 12 % red on slide
 G : 50 % green on Ae --> \pm 20 % green on slide
 B : 50 % blue on Ae --> \pm 22 % blue on slide

The separate curves can be displayed on level 1 for red, 2 for green and 3 for blue.

N° of exposures : <1>

The number of exposures the operator wants.

As soon as all parameters have been entered, an overview will be displayed on the right hand b/w screen. The operator has the possibility to change the variable up to the last moment.

 OUTPUT TO DEVICE

Output to device : OCR
 Name of raster file :
 Name of look-up file :
 N° of exposures : 1

 Correctly specified (Y, N) : <Y>

If everything has been correctly specified, just press the <enter>-key to start up the "output process".

B. Framebuffer files

Name of raster file : < >

This parameter does not need to be filled out.
 Press the <enter>-key to go on.

Name of framebuffer file : < >

Enter the name of the framebuffer file. There is no prefix necessary.

Magnification factor (framebuffer file) : <6>

The magnification factor is the factor by which the 512 x 512 pixel framebuffer size is multiplied on the output, i.e. the factor the image has to be enlarged by. It is advisable to use magnification factors 5 or 8 depending on height or width mode used.

Name of look-up file : < >

See page 2.9.

 OUTPUT TO DEVICE

Output to device : QCR
 Name of raster file :
 Name of framebuffer file :
 Magnification factor (framebuffer file) :
 Name of look-up file :
 N° of exposures : 1

Correctly specified (Y, N) : <Y>

Press the <enter>-key to start up the process.

C. Combination vector file - framebuffer file

Name of rasterfile : < >

Enter the name of the rasterfile. Beware not to forget the prefix "r."

Name of framebuffer file

Name of the desired framebuffer file.

Magnification factor : <6>

See page 2.10.

Keep in mind that, in case of combination of a framebuffer file and a vector file, it is necessary to keep the same magnification factor entered in the raster parameter menu.

Name of look-up file :

See page 2.9.

N° of exposures : <1>

Number of exposures wanted by the operator.

As soon as the parameters have been filled out, the overview offers the possibility to change variables, if necessary.

OUTPUT TO DEVICE

Output device : QCR
Name of rasterfile :
Name of framebuffer file :
Magnification factor (framebuffer file) :
Name of look-up table :
N° of exposures :

Correctly specified (Y, N) : <Y>

Press the <enter>-key to output the combination vectorfile -
framebuffer file on PCR/QCR.

2.2.2. Versatec A4 - 3 colours/Versatec A3 - 3 colours

Remark : Make sure the exact paper size is being used and the exact type of ink roller has been installed (A4 paper size and 3 colour ink-roller)

A. Vector files

Name of raster file : < >

Enter name of vector file that needs to be output on the thermal transfer printer.

Name of framebuffer file : < >

This parameter does not need to be filled out.

Dither size (1 ... 16) : < >

The dither size, combined with the dither matrix permits the increase or decrease of the number of colour variations. A low dither size implies a low number of colours being used.

A high dither size implies many colour variations.

Dither matrix

1. matrix 0

2. matrix 1

Your choice : < 2 >

The dither size determines the size of the matrix. Only for dither size 16, there is a difference between matrix 0 and 1. (The matrices are essentially colour value-referential tables, determining whether a colour is printed or not. Do not confuse with look-up tables).

Choice of matrix 0 or 1 is a preference for the user.

N° of exposures < 1 >

Number of outputs the operator wants to be produced.

The parameter overview will be displayed on the right hand b/w monitor. The operator can, if he wants to, still change some parameters.

 OUTPUT TO DEVICE

output device : VERSATEC A4 - 3 colours
 name of raster-file :
 dither size :
 dither matrix :
 n° of exposures :

Correctly specified (Y,N):

The <enter>-key will start up the output program.

B. Framebuffer files

Name of raster file

This parameter does not need to be filled out.

Name of framebuffer file

Enter name of framebuffer file that needs to be output.

Magnification factor

The magnification factor is the factor (multiple) by which the 512 x 512 pixel framebuffer size is multiplied on the output, i.e. the time an image has to be enlarged on the output.

It is advisable to use magnification factor 4 for A4 and 6 for A3.

Dither size (1 ... 16) : < >

The dither size, combined with the dither matrix permits the increase or decrease of the number of colour variations. A low dither size implies a low number of colours being used.

A high dither size implies many colour variations.

Dither matrix

1. matrix 0

2. matrix 1

Your choice : < 2 >

The dither size determines the size of the matrix. Only for dither size 16, there is a difference between matrix 0 and 1. (Essentially the matrices are colour value-referential tables, determining whether a colour is printed or not. Do not confuse with look-up tables).

Trial investigations are useful to decide in what circumstances which matrix is to be used.

N° of exposures : < 1 >

The number of exposures that have to be produced. The parameter-overview (entry) will be displayed for a last check.

 OUTPUT TO DEVICE

output device : Versatec A4 - 3 colours
 Name of raster file :
 Name of framebuffer file :
 Magnification factor (frame
 buffer file) :
 dither size :
 dither matrix :
 n° of exposures :

 Correctly specified (Y,N) :

Press the <enter>-key to start up the program.

C. Combination of vector file - framebuffer file

Name of raster file

The name of the raster file that has to be output. (combined with a framebuffer file)

Name of framebuffer file

The name of the framebuffer file that has to be output. (in combination with a rastered file)

Magnification factor (framebuffer file)

See page 2.14.

Dither size <116>

See page 2.14.

Dither matrix
 1. matrix 0
 2. matrix 1
 Your choice : < 2 >

See page 2.15.

N° of exposures

Number of outputs that have to be produced.

As soon as all parameters have been filled in, a parameter overview will be displayed, to make, if necessary further changes.

 OUTPUT TO DEVICE

| | |
|---|---|
| output device | : |
| Name of raster file | : |
| Name of framebuffer file : | |
| Magnification factor (frame buffer file) | : |
| dither size | : |
| dither matrix | : |
| no of exposures | : |

Correctly specified (Y,N)

The <enter>-key will start up the output-process.

It is advisable to quit the background processing in order to speed up the output process.

2.2.3. VERSATEC A4 - 4 colours/VERSATEC A3 - 4 colours

Remark : The only difference between Versatec A4 - 4 colours and A3 - 4 colours is the paper size. Make sure the exact papersize (A3/A4) and the exact ink roller type being used.

A. Vector files

Name of raster file : < >

Enter name of vector file that needs to be output on the thermal transfer printer. Beware that the raster file name is preceded by the prefix "r."

Name of framebuffer file : < >

This parameter does not need to be filled out when only vector files are being output.

Dither size (1 ... 16) : < >

The dither size, combined with the dither matrix offers the possibility to increase or decrease the number of colour variations.

A low dither size implies only few colours being used, but on the other hand, high resolution.

A high dither size implies exactly the opposite. Many colour variations can be used, but only with low resolution impression.

Dither matrix

1. matrix 0

2. matrix 1

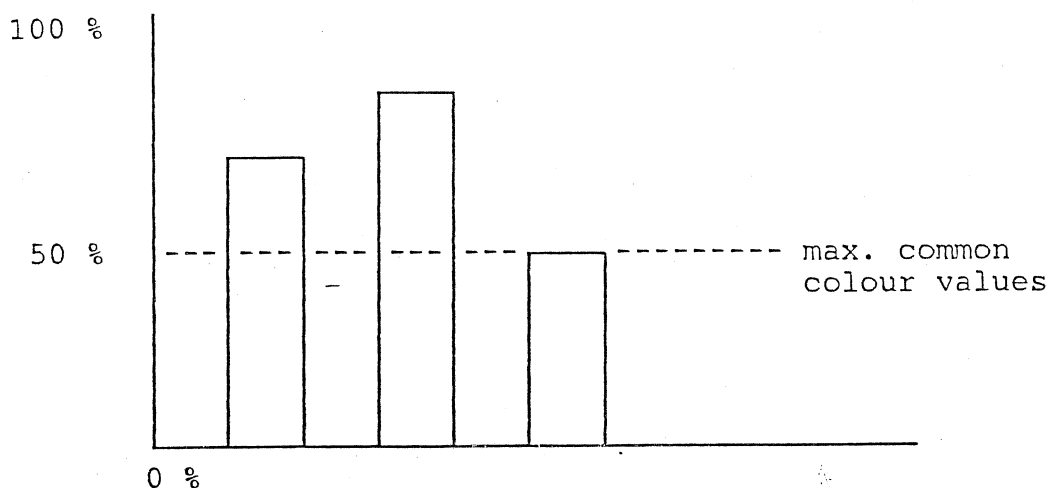
Your choice : < 2 >

The dither size determines the size of the matrix. Only for dither size 16, there is a difference between matrix 0 and 1. (Fundamentally these matrices are colour value-referential tables, determining whether a colour is printed or not. Do not confuse with look-up tables). It will need some research to decide when and in which circumstances, matrix 0 or 1 are the best to use.

Min. Black value (0 ... 255) : < 60 >

The minimum black value-parameter gives outputs a deeper colour.

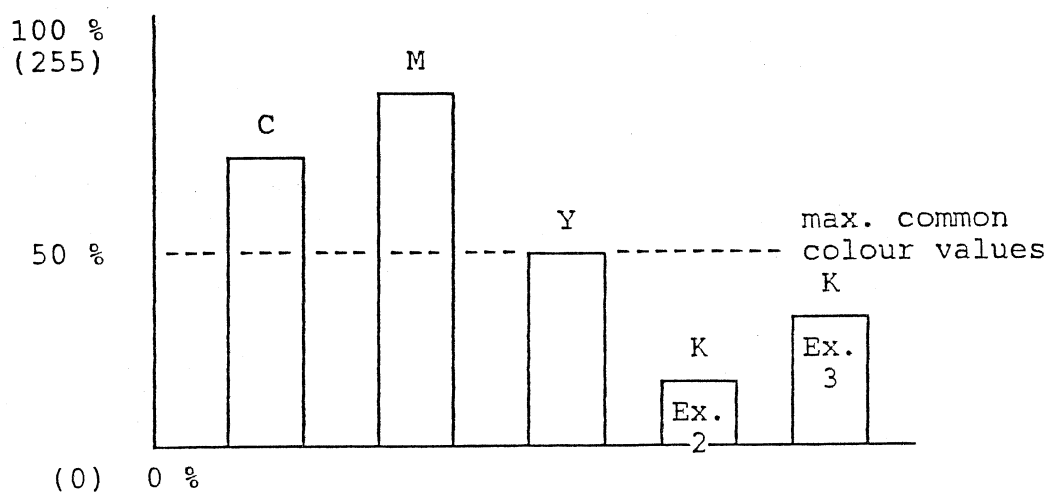
Dependant on the maximum common values of the C, M, Y colours in a picture, and the min. black value, the black component will or will not be added to the picture.



The difference between the minimum black value and the max. common colour-values determines the black component that is to be added to the picture.

A minimum black value of 60 (or 30 %) is generally considered to be an appropriate min. black value.

Again, only experiments can point out the best variables.



- Examples :
1. Min. black value : 50 % : black component 0
 2. Min. black value : 40 % : black component 10 %
 3. Min. black value : 10 % : black component 40 %

N° of exposures < 1 >

Number of exposures the operator wants to be produced.

A parameter overview permits the operator to have an ultimate check. Up to this moment, the operator can still change a parameter.

 OUTPUT TO DEVICE

output device :
 Name of raster file :
 dither size
 dither matrix
 Min black value
 N° of exposures

 Correctly specified (Y,N) : < Y >

By pressing the <enter>-key, the output-process will be started.

B. Framebuffer files

Name of raster file

This parameter does not need to be filled out when only framebuffer files are being output.

Name of framebuffer file

Enter name of framebuffer file that needs to be output on the thermal transfer printer.

Magnification factor : (framebuffer file)

See page 2.14

Dither size (1 ... 16) : < >

See page 2.17.

Dither matrix
 1. matrix 0
 2. matrix 1
 Your choice : < 2 >

See page 2.17.

Min. Black values (0 ... 255) : < 60 >

See page 2.18.

N° of exposures < 1 >

Number of outputs that have to be made.

As soon as all parameters are filled out, the parameter overview will be displayed on the right hand b/w monitor.

 OUTPUT TO DEVICE

output device : Versatec A4 - 3 colours
 Name of raster file :
 Name of framebuffer file :
 Magnification factor (frame
 buffer file) :
 dither size :
 dither matrix :
 Min black value :
 N° of exposures :

 Correctly specified (Y,N) : < Y >

To output the framebuffer file on the Versatec, press the <enter>-key.

To speed up the output process, leave the background-processing menu.

C. Combination vector file - framebuffer file.

Name of raster file < >

The name of the raster file has to be output, in combination with the framebuffer file. Beware that the filename is preceded by "r."

Name of framebuffer file < >

The name of the framebuffer file that has to be output (combined with a raster file)

Magnification factor (framebuffer file)

See page 2.14.

Dither size (1 ... 16) : < >

See page 2.17.

Dither matrix
 1. matrix 0
 2. matrix 1
 Your choice : < 2 >

See page 2.17.

Min. black value

See page 2.18.

 OUTPUT TO DEVICE

output device :
 Name of raster file :
 Name of framebuffer file :
 Magnification factor (frame
 buffer file) :
 dither size :
 dither matrix :
 Min black value :
 N° of exposures :

 Correctly specified (Y,N) : < Y >

Press the <enter>-key to start up the output program.

2.2.4. D-SCAN

As the D-Scan is also a thermal transfer printer, A3-paper size and 3 colour ink roller, its dialogue will be identical to the Versatec's A3 -3 colour menu.

See page 2.13. to 2.17.

Remark : In case the image to scan was positioned upside down on the inputscanner, the result on the Aesthedes screen will also be turned upside down. Do not forget the Aesthedes offers the possibility to turn images around its X- and Y-axis.

Procedure : - CHAIN ALL (Dynamics-keygroup)

- Press spacebar
- indicate Y-scale and/or X-scale by means of the cursor
- Enter -1

It will not be necessary to repeat the complete scanning-procedure.

3.2. COLOUR SCAN

Remark : Colour scan : continuous tone (photographs and original paintings) and halftone image (images from magazines or other printed media.)

SIZE OF THE RECTANGLE TO SCAN

- 1 : A4 landscape
- 2 : A4 portrait
- 3 : A3
- 4 : Custom

See page 2.24. and 2.25.

POSITION OF THE WINDOW

- 1 : Aligned in corner (image positioned in (0,0))
- 2 : Centered in X direction (scanner X direction)
- 3 : Custom :
 - X-offset : (inch)
 - Y-offset : (inch)

COLOUR CORRECTION

- 1 : No correction

When the scanned image has to be displayed/printed true to the original, do not correct any colours. Due to the image deformation, caused by the monitors, colours will contrast with each other.

2 : Gamma 0.45

In order to neutralize the image deformation, caused by the monitors, gamma 0,45 (a standard value) can be used. (Colours will be less in contrast to each other).

3 : Custom (See also Appendix I)

CUSTOM COLOUR CORRECTION

Look Up Tables will be generated so that
 result = $I_0 + K \times \text{Intensity}^{**N}$
 (intensities are values between 0 and 1)

Give Parameters for RED

I_0 :

K :

N :

Computing Look Up Tables ...

Give parameters for GREEN

I_0 :

K :

N :

Computing Look Up Tables

Give parameters for BLUE

I_0 :

K :

N :

Computing Look Up Tables

Each "scanned" colour (R, G, B) can be corrected by hand, changing the offset (I_0), gain (K) and gamma correction (N) values. (cfr. Appendix II)

This means : offset : I_0 : -0,3 ... +0,3
 gain : K : 0,5 ... 1,5
 gamma correction : N : 0,4 ... 1,2

DATA REDUCTION OF THE SCANNED IMAGE

To reduce the size of the file that is produced, the image can be compressed. This process gives a small loss in quality.

Give a number between 0 and 10 :

Data reduction is introduced to increase "storage space" on the harddisk/floppy disk.

Using 0 as a threshold, no data reduction will take place and as a consequence, no disk space will be saved.

The quality of the scanned image will be unaffected.

For the threshold 10, data reduction will be executed and disk space saved. The quality of the scanned image will decrease but not dramatically.

A compromise between saved diskspace and loss of quality will be reached by threshold 5.

A different threshold value may be necessary depending on the relative contrast or flatness of the image being treated. In view of this, trials are advisable.

Filename

The scanned image will be stored, with this name, on the Aesthedes' harddisk.

PARAMETERS FOR COLOUR-SCAN

Image size : X = inch Y = inch
Image offset : X = inch Y = inch

Colour correction

Data compression

Filename

Are these parameters correct (Y/N)

When all parameters are correctly filled out, just press the <enter>-key to start the scanning-process.

3.3. STATUS

The status will indicate whether the scanning process is still running (busy) or already finished (Successfully completed).

Beware that, to obtain a status of the inputscanning, it is necessary to use the status option in the inputscanner menu. Do not use the status-option in the main menu (background-processing menu). The latter will give no information on this process.

3.4. ABORT JOB

It is possible to stop the scanning at any time by using the "abort job"-option.

Are you sure (Y/N)

Kill process : (the information that is displayed is of no importance to the operator)

Status when stopped :

3.5. MAIN MENU

Return to the background processing-menu.

NOTE :

To display a vectorfile, push the display menu key (key in the framebuffer-function key-area) and indicate 'level colours' by means of the cursor.

Load the file from disk and the scanned image will be displayed.

To display a colour scan, push the display-menu key and choose framebuffer by means of the cursor.

Load the file from disk and the scanned image will be displayed on the monitor.

4. STATUS

The status option permits the operator at any time, at any stage to obtain a complete survey of the "rasterizer" and "output to device" background process.

| Process | Name | Status |
|---------------------------------------|---|------------------------|
| The kind of process that is going on. | Name of the file that is being processed. | RUNNING or TERMINATED. |

Remark : To obtain a status of the scanning or plotprocess, it is necessary to start up the plot and scanning program itself.
The respective submenu provides an "own" status-option.

5. TASK FILE

5.1. Introduction

In every type of production environment, a lot of processes have to be carried out repeatedly. By creating a task file, it is possible to simplify and speed up production.

5.2. Procedure

Task file menu

1. Edit task file
2. Copy a task file
3. Delete a task file
4. Return to main menu

5.2.1. Edit taskfile

Used to create or change task files

Task file name : < > B. - - - -

Enter a task file name for storage on harddisk.

Make sure a task file is always preceded by the prefix "b."

The following submenu will be displayed on the right hand b/w monitor.

This menu permits you to add new files or to modify existing files.

```

## BEGIN OF FILE LIST ##
## END OF FILE LIST ##
1. Next entry (N)
2. Previous entry (P)
3. Modify entry (M)
4. Insert before (I)
5. Delete entry (D)
6. Save taskfile (E)
7. Quit editing (Q)

```

your choice : < 1 >

Both the option-number, as well as the option-character (between brackets) can be used to make to choice.

1. Next entry (N) / 2. Previous entry (P)

It is possible to scroll through the files entries (parameter overview) already made.

3. Modify entry (M)

Permits the operator to modify or correct an entry (parameters), provided the entry is displayed on the screen (next/previous entry).

4. Insert before (I)

To insert a new file entry. The new file will be positioned at the end of the task file list, or, just before the file entry that is displayed on the Aesthedes-screen at that moment.

Task menu :

```

1. Rasterizer
2. Output to device
Your choice : < 1 >

```

The parameters for the rasterizer and the output to device are exactly the same as have been treated in part 1 (rasterizer) and part 2 (output to device) of this chapter. So, please check with these items to make up the entry.

Beware : DO NOT FORGET to save your entry in the task file.

(As soon as all parameters have been filled out, the entry will be displayed. When correctly specified, save the new task file).

5. Delete entry (D)

At any time, an entry can be deleted from the taskfile. Select the entry to be deleted and use option 5 (D).

6. Save task file (E)

As soon as the task file is built up, it has to be saved on harddisk.

7. Quit editing (Q)

To leave the "edit task file" - submenu and return to the task file menu.

5.2.2. Copy a task file

This copy function allows to use an existing task file as a basis for a new task file, with a new name.

Task file to be copied : < >

Enter the name of task file that has to be copied.

New file name : < >

Enter name for the copied file

Copying file to

Indicates the task file is being copied.

Copy successfull completed

5.2.3 Delete a task file

The operator can delete a taskfile from harddisk.

Task file to be deleted :

Enter the name of the task file that has to be removed from harddisk.

5.2.4. Return to main menu.

By means of this option, it is possible to return to the background main menu.

6. START TASK FILE

Give task file : < >

The name of the task file that has to be executed.

To obtain a status of the task file, use the status-option (4) of the background processing main menu.

It will indicate what file is being processed (without any other information being specified)

7. STOP TASK FILE

Are you sure to stop the task (Y/N) : < N >

8. STATUS OF TASK FILE

The status of the task file gives a detailed survey of the parameters that have been filled out : information on the filetype and whether the program is successfully started and completed or not.

At any stage, it is possible to leave this status.

9. PLOTTER

BACKGROUND PLOT version 1.0

1. Start plot
2. Status
3. Abort plot

4. Main menu

9.1. Start plot

PLOT MENU b.g. version 08.06.88

Plotters supported

| | | | |
|------------|----------|------------|------------|
| HP = 1 | TA30 = 2 | GERBER = 3 | ARISTO = 4 |
| ROLAND = 5 | TA10 = 6 | | |

Select plotter type

9.1.1. HP(1)/ROLAND(5)

File to plot< >

Enter the name of the file that has to be plotted.

Plot all levels< >

Possibility either to plot all levels or one particular level, which has to be selected.

Which level :

Remark : before the plotter in background process is even started, the operator should know exactly what he wants to have plotted.

Scale factor< >

The scale factor determines the sizes of the picture/design on paper.

Scale factor 1 corresponds with an output of 1024 x 1024 mm (Aesthedes-screen size)

X displacement (in mm).....< >

Y displacement (in mm).....< >

Possibility to "displace" the picture in X or Y direction.

Keep in mind the down left corner of the Aesthedes screen will correspond with the down left corner of the plot. The X and Y displacement-parameters are closely related with the scale factor.

Make changes on pen selection< >

Each level can be plotted with a different pen

Change pen parameters (speed, thickness,...)< >

PEN SELECTIONS (C = Copy to all; P = previous; G = Go to; Q = Quit)
 C = Copy to all : the selected pen will be used for all levels
 P = previous : back to the previous level
 G = Go to : enter a level number and select a pen for the particular level
 Q = Quit : return to the plotter-menu

Change pen parameters (C = Copy to all; P = previous; G = Go to; Q = Quit)

A number of parameters need to be filled out for each pen (up to 128 pens can be selected)

Pen number

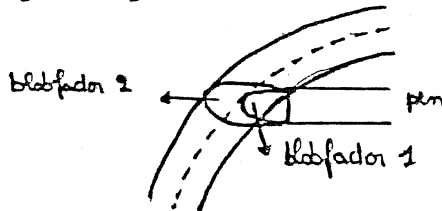
Speed (cm/s) (plotter dependant)
 acceleration (cm/s²) (plotter dependant)
 thickness (mm)

This variable is determined by the thickness of the pen that is being used (only for "fill picture").

blob-factor

Variable determined by the pen and only to be entered for "fill picture".

A blob originates as soon as the pen is positioned on the paper (beginning of a line) or lifted up (end).



blobfactor = 1 (min. value) thickness of the pen
 blobfactor = 2 twice the thickness of the pen.
 etc.

Fill picture< >

The operator has to choose whether he wants the picture to be filled or not on the output.

Distance between lines (mm)

If a picture has to be completely filled, enter a very low variable (e.g. 0,05 or 0,1).

Do not enter 0. (Pen will remain at the same position.)

Rotate picture 90 °.

Creations can be rotated 90° and plotted on paper.

Keep in mind the X and Y-directions on the plotter do NOT change.

Use flight mode

Only to be used if a file, created with flight position, is to be plotted.

This option ensures the complete file will be plotted.

9.1.2. TA30(1) and TA10(6)

Change pen parameters (speed, thickness)

PEN PARAMETERS

speed (cm/s) (plotter dependant)

acceleration (cm/s²) (plotter dependant)

pen up angle (degrees)

The angle for which the cutter will be lifted and turned. (to avoid film damaging)

thickness (mm)

This variable is determined by the thickness of the pen that is being used (only for "fill picture").

blob-factor

Variable determined by the pen and only to be entered for "fill picture".

A blob originates as soon as the pen is positioned on the paper (beginning of a line) or lifted up (end).

9.1.3. GERBER/ARISTO

The parameters that have to be filled out for the Gerber and Aristomat photoplotters are exactly the same as for the HP/Roland plotter. Only in "the change pen parameters" group less variables have to be entered.

Change pen parameters

PEN PARAMETERS (C = Copy to all; P = previous; G = Go to; Q = Quit)

C = Copy to all : the selected pen will be used for all levels

P = previous : back to the previous level

G = Go to : enter a level number and select a pen for that particular level

Q = Quit : return to the plotter-menu

Change pen parameters (C = Copy to all; P = previous; G = Go to; Q = Quit)

A number of parameters need to be filled out for each pen (up to 128 pens can be selected)

Pen number

thickness (mm)

9.2. Status

Status of the plotter-process running in background

9.3. Abort plot

At any time, it is possible to stop the plotter-process.

9.4. Main menu

Return to the main background processing menu.

80. INSTALLATION

The installation software option is reserved to service engineers. Only the engineers are allowed and trained to use this option in the appropriate way. It is of no use to try it out as the system will close down.

99. QUIT

Terminates the background processing program.

CHAPTER 3 : TEXT EDITING1. INTRODUCTION

With the software-release 04005x27, the typesetting function of the Aesthedes Workstation is extended extremely.

From now on, it is possible to organize a textblock to the wishes of the user.

The "editing"-key in the type setting keygroup starts the program.

1. Create or edit a text
2. Set text on the screen
3. Set cursor to the beginning of the buffer
4. Set letter/word spacing ratio
5. Set fontsize/letterspacing
6. Set fraction of maximum wordspacing
7. Set fraction of maximum letterspacing
8. Set indentation

9. Quit

2. Operating instructions

Basically, the text editing is an extension of the existing typesetting functions.

As a consequence, the normal procedure to display a text on the screen is to be followed.

Draw a line on the screen and select a font. At this stage, the textsetting function can be activated.

1. Create or edit a text

The operator can create a new text or edit (restore) a text, created previously and saved in an internal buffer.

Restore saved text (Y/N)

~~A. Create a text (Restore saved text : N)~~

The cursor will be positioned at the upper left hand corner of the right hand b/w monitor.

The mechanical as well as the membrane keyboard can be used to type in text. The <return>-key is only to be used to create new paragraphs.

The cursor can be moved around throughout the text.

CTRL F = right
CTRL D = left
CTRL E = up
CTRL C = down

Correction can be made by means of the Rub-out key. Not only for character corrections, also "textlines" can be corrected.

(Cursor in the first column, and the Rub out key)

As soon as the text is ready, press CTRL X to leave the editor.

The operator will be asked if he wants to save the text in the internal buffer or not (Save text (Y,N) :)

2. Set text on the screen

The text, stored in the internal buffer, can be displayed on the Aesthedes screen. By means of the cursor, the operator has to mark the block where the text has to be positioned.

(In general, the line that has been drawn, in the beginning of the type setting process.

3. Set cursor to the beginning of the buffer

It is possible to only display a part of the created text, stored in the internal buffer, on the screen, dependant on the position of the cursor. Option 3 moves the cursor automatically to the beginning of the buffer, and the complete contents of the buffer will be displayed.

4. Set letter/word spacing ratio (0,5) :

If you want the spacing to be adjusted between letters only, give a value of 0 and between words only, give 1. A value between 0 and 1 will give spacing in proportion to the value.

5. Set font size/letterspacing

Enter font size in mm.

Probably this parameter has already been filled out in the select size parameter-group.

Enter line spacing in mm.

Enter a variable for the distance between the lines.

6. Set fraction of maximum wordspacing

Organising a text block, the text is filled out by increasing the wordspacing (and letterspacing). The maximum threshold wordspacing allowed can be defined by the user himself.

As soon as this is exceeded, the text will be aligned at the left (instead of filled out).

The total maximum word spacing allowed is the fraction multiplied by the pointsize.

e.g. fraction : 0,7 pointsize 30 mm maximum wordspacing.

A realistic fraction value varies between 0.... 1.

7. Set fraction of maximum letterspacing

Organizing a block of text, the text is filled out by increasing the letterspacing (or spacing).

The maximum letterspacing allowed can be defined by the user himself.

As soon as the threshold is exceeded, the text will be aligned at the left.

The function value is related to the pointsize. The total maximum letterspacing allowed is the function multiplied by the pointsize.

e.g. fraction : pointsize 30 maximum wordspacing :

A realistic fraction value varies between 0 and 0,5.

8. Set Indentation

Enter indentation in mm.

The indentation parameter (positive as well as negative) allows to move the opening line of a paragraph to the right (positive value) or to the left (negative value)

9. Quit

To leave the text editing function.

APPENDIX I

COLOUR CORRECTION

I. Introduction

Sometimes it may be desirable to brighten up an image, to render a portrait a pasteltint, to correct a tint of colours or to create a colour effect.

Through the "custom colour correction" option, such modifications (or creations) can be realised.

The formula, the colour correction has been based upon is of the following type :

$$y = a + b.x^c$$

Only the parameters got a different name in our application

$$\text{Result} = I_0 + K.I^n$$

Result : final intensity of a colour pixel in the frame buffer.

I_0 : offset

K : gain

N : gamma-correction

I : scanned intensity : intensity of the original photograph or file.

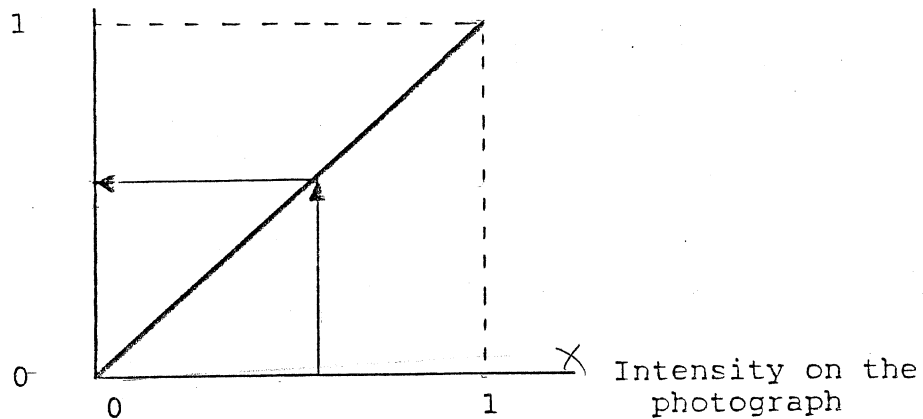
As each colour pixel is composed of 3 components (red, green, blue), an offset (I_0), gain (K) and a gamma-correction (N) variables needs to be entered for each of the colours.

In the following pages, red, green and blue are considered to have got each time the same parameters, unless it has been clearly specified.

II. The impact of various parameters

1. No colour correction

Intensity on the screen



- the colour intensity of the original photograph (on the scanner) is displayed on the X-axis.
- the colour intensity of the scanned photograph (on the screen) is on the Y-axis
- value 1 is maximum (white) : value 0 is the minimum (black)

The function shows that the black parts on the photograph will be displayed as such on the Aesthedes screen, dark grey remains dark grey, light grey remains light grey and white remains white.

With the colour correction-formula : $\text{Result} = I_0 + K \cdot I^n$, the above curve would be effective if :

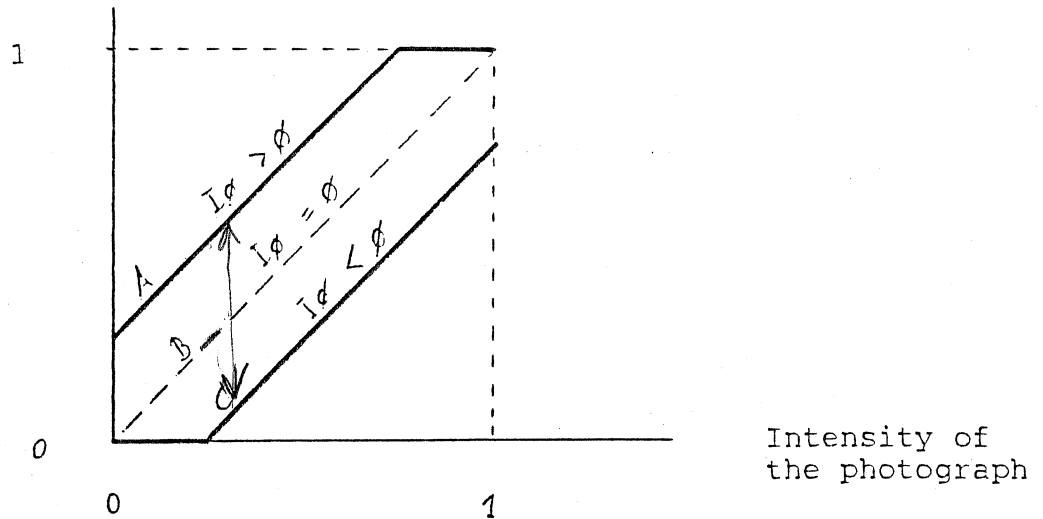
I_0 : offset = 0
 K : gain = 1
 N : gamma-correction = 1

For these variables : $\text{Result} = \text{Intensity}$ or, the screens intensity = the photographs intensity.

==> NO colour correction has been used.

2. Offset ($I\phi$)

Intensity of the screen

Remember : result : $I_s = I_0 + K \cdot I_p^n$

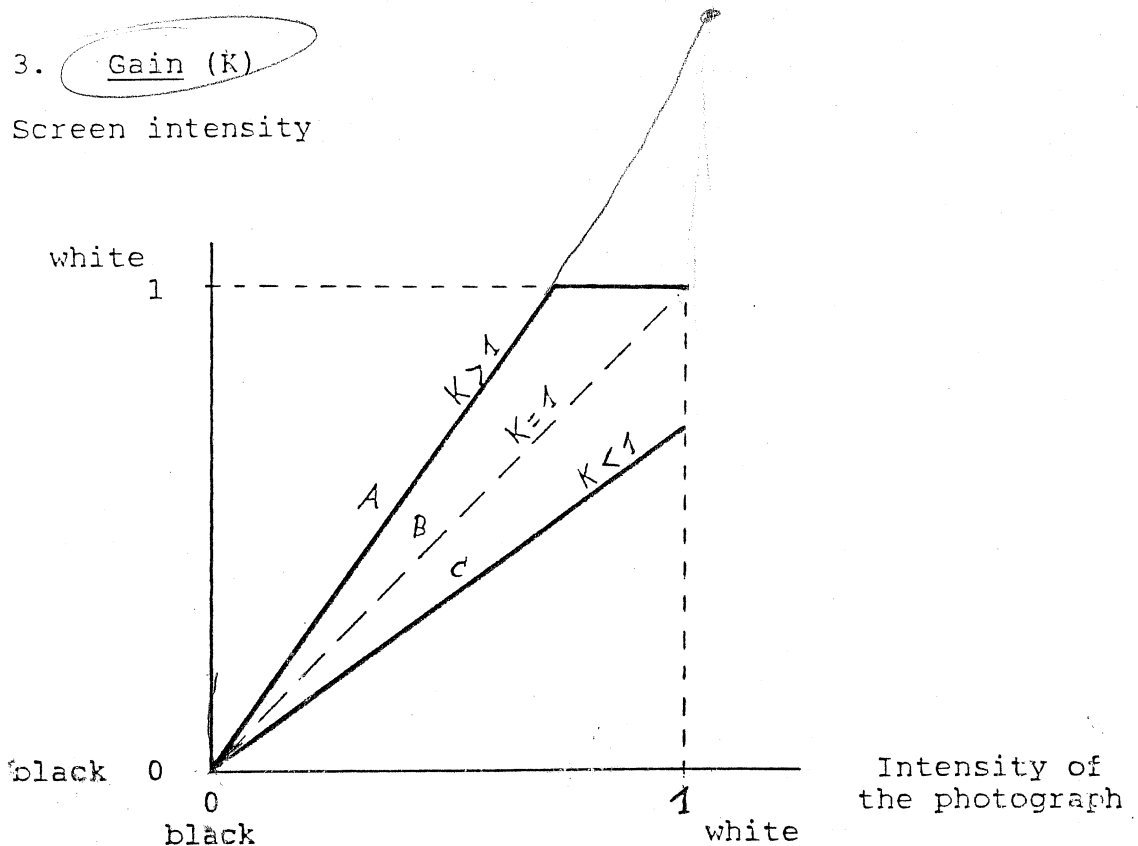
Using an offset > 0 , the transfer curve will move up from B to A. (Illustration 2)

- black (photograph) becomes dark grey on the screen.
- middle grey become light grey
- light grey becomes white
- white remains white

Adding a positive offset, images will get a pastel effect, suited for portraits with a bright background.

A disadvantage is that, details will not be visible in the brighter parts of the photographs, as they turn white on the screen. At this stage, "clipping" to the white.

A negative offset will make the transfer function move downwards (B to C). The image on the screen will be darker than the original photograph. In this situation, clipping to black : the details in the darker parts will be lost.



In case K (gain) > 1 , the transfer function will change its course and will steepen. (B \rightarrow A)

All tones on the screen will be brighter than on the original photograph. Clipping is possible to the white parts.

This parameter ($K > 1$) can be used to brighter up under exposed material : a colour range between black and middle-grey can be expanded to a black to white colour range on the screen.

The function curve will be less steep with a gain < 1 (B \rightarrow C). The image will be darker on the screen than on the photograph itself.

Remark 1 : Experience has proved that it is advisable to modify the offset (I 0) and gain (K) simultaneously.

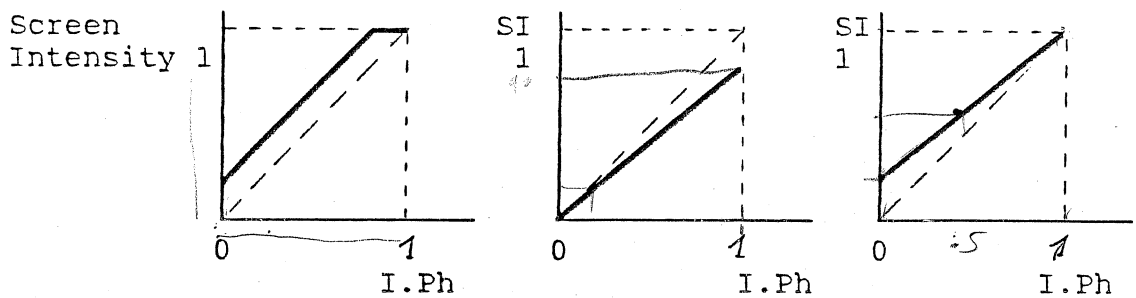
Some examples will prove this :

Example 1 :

A positive offset (e.g. 0,1) will make the image slightly brighter, but as a consequence, there will be clipping to the white. In this case, it might be interesting to use a gain value of 0,9, so that the function-curve will be less steep. Clipping will be avoided.

The image will get a pastel-effect, but at the same time, the details in the delicate tints will be saved.

schematic :



offset $I_0 > 0$ + gain $K < 1$ => Result.
 $I_0 = + 0,1$ $K = 0,9$

$$I \phi + K$$

$$.1 + .9 X$$

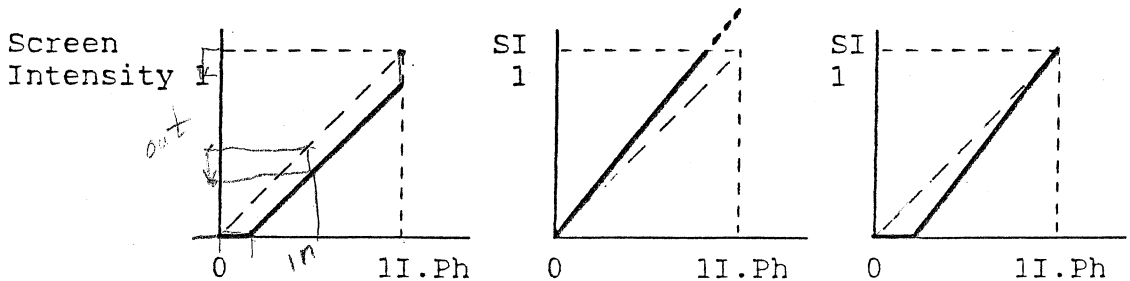
Example 2 :

Using a negative offset, the image on the screen will be slightly darker and there will be clipping to the black. The light tones of the photoplatter will get a dirty-grey tint on the screen.

These light parts can be brightened up via a gain ($K > 1$), e.g. $K = 1,2$.

In this way, shadows on a photograph can be enriched, deepened, without the whole image turning grey.

schematic



offset $I_0 < 0$ + gain $K > 1$ => Result
 $I_0 = - 0,2$ $K = 1,2$

Remark 1 : To create or to correct certain shades, it is also possible to place different variables to the red, green and blue components,
 e.g. $I_0 \text{ red} = 0,05$
 $I_0 \text{ green} = 0$
 $I_0 \text{ blue} = 0$

These parameters will create a pinkish shade or correct a blue shade on the photograph.

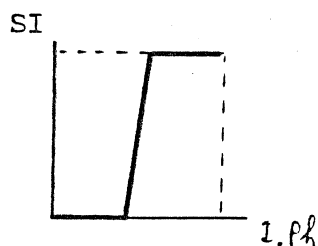
Remark 2 : Special effects :
 e.g. $I_0 = 0$ for red, green, blue
 $K = 1$ for red
 $K = 0$ for green and blue

In this case, only the red component will be saved. Green and blue will be filtered. These parameters give the following result in the formula :

$$\begin{aligned} \text{Result (red)} &: 0 + 1.I \text{ (red)}^1 = I \text{ (red)} \\ \text{Result (green)} &: 0 + 0.I \text{ (green)}^1 = 0 \\ \text{Result (blue)} &: 0 + 0.I \text{ (blue)}^1 = 0 \end{aligned}$$

Remark 3 : Using extreme parameters, artistic effects can be created,
 e.g. red, green, blue : $I_0 = -5$
 $K = 11$

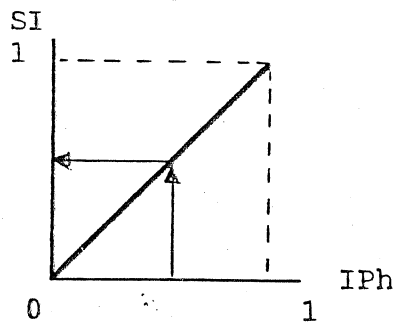
Transfer curve :



The result resembles a collage, composed of coloured paper.

4. Gamma correction

In most cases, the operator wants the images on the Aesthetes-workstation-screen to be a true representation of the original photograph, i.e. same colour values, colour variations and gradations. This implies a linear function curve. In practice this means that middle grey on the photograph, will be and remain middle grey on the screen, and will not turn into dark or light grey.

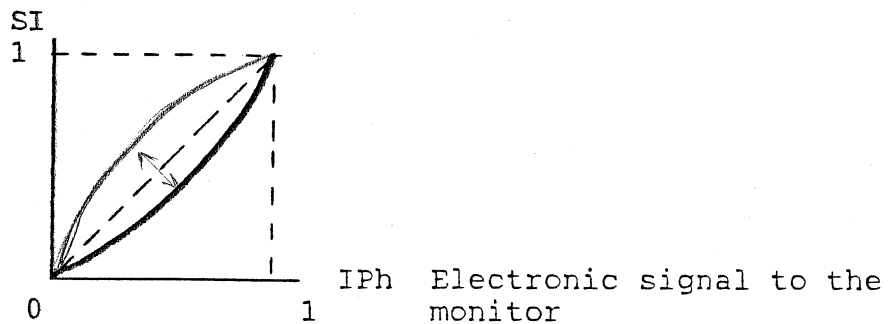


I_0 = offset
 K = gain
 N = gamma correction
 I = scanned intensity
 (input value)

Formula : Result = $I_0 + K \cdot I^n$

I_0 = 0
 K = 1
 N = 1

Most of the video-monitors, however, do not have a linear transfer function curve that resembles the following illustration.



Transfer function of a video-monitor.

This corresponds with a power function > 1 .
 e.g. Result = $A + B \cdot I^n$ (n being 2)

The power is often called "gamma".
On the screen, dark areas will fill in, and at the same time, lighter tones are vivid and intense.

In order to obtain a linear function curve, the scanners transfer function has to have the exact opposite course of the monitors function curve.

Electronic signal
to the monitor



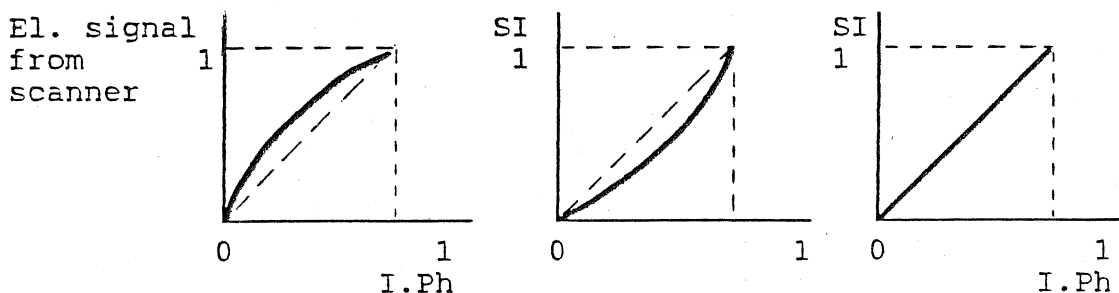
An example of gamma correction

It is the schematic representation of a power function with a power 1,

e.g. Result : $I_0 + K \cdot I^n$ (n being 0,5)

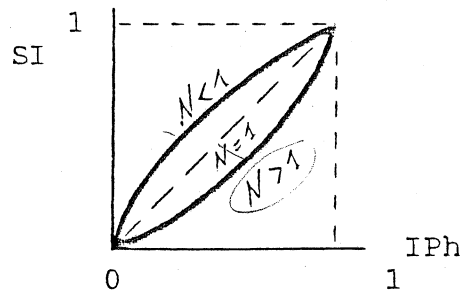
With a gamma correction 1, colours will become faded and smoother. In the dark parts, details will be visible.

The final result of the combination of both transfer functions is a linear function curve.



Remark 1 : In case the scanned image has to be output afterwards, a gamma correction may or may not be necessary, but if so - only very slight correction.

Remark 2 : On a Versatec thermal transfer print, dark areas tend to close a bit.
In general, colours are rather dark. In this case, a slight gamma-correction might be necessary.
e.g. N : 0,7 ... 0,9.

SUMMARY

Gamma correction
 Result = $I_0 + K \cdot I^n$

- $N = 1$: generates no colour correction
- $N > 1$: colour will become more vivid and contrasting, and dark areas will fill in
- $N < 1$: colour will become smooth, dark areas retain the details.

5. Examples of colour corrections

In these examples, it is considered that all examples are to be output on a Versatec thermal transfer printer.

example 1 : Portrait of a girl with a bright back ground. The final result requires a pastel-effect.

- red, green, blue - parameters :

I0 = 0,1

K = 0,9

N = 0,7

The offset (0,1 to 0,2) together with the major gamma director create a soft-focus and pastel effect.

example 2 : Portrait with light background

- red, green, blue - parameters :

I0 = 0,05...0,1

K = 0,95...0,9

N = 0,8....0,9

A minor offset, combined with only a minor gamma correction will intensify the usually dark eyes and tone down the portrait.

example 3 : Bright portrait with a rather dark background.

- red, green, blue - parameters

I0 = 0...-0,1

K = 1...1,1

N = 0,9

A middle dark background becomes full of spots on a Versatec thermal transfer print.

So, background might be even darker, as long as the eyes and hair are still distinctive.

example 4 : Landscape

- red, green, blue-parameters :

I0 = 0

K = 1

N = 0,9

example 5 : Advert from a magazine, with vivid colours

- red, green, blue parameters :

I0 = 0

K = 1

N = 0,9

example 6 : Landscape (correctly exposed). The final result, however, has to give the impression the photo has been taken with a blue-filter.

- red, green-parameters :
 - I0 = 0
 - K = 1
 - N = 0,9
- blue parameters
 - I0 = 0,1
 - K = 0,9
 - N = 0,8

example 7 : Indoor photograph (with flash). The typical blue

shade has to be corrected.

- red parameters
 - I0 = 0,05...0,1
 - K = 0,95
 - N = 0,8
- green, blue-parameter
 - I0 = 0
 - K = 0,95
 - N = 0,8

6. Recommended parameter values to obtain normal effects

| Parameter | Extreme values | most used values |
|-------------------------|----------------|------------------|
| I0 = offset | -0,3...+0,3 | -0,1...+0,2 |
| K = gain | 0,5... 1,5 | 0,8... 1,2 |
| N = gamma correction | 0,4... 1,2 | 0,6... 1,0 |

To obtain special effect and colour filtration, all kinds of extreme parameter values can be used.

7. Summary

Offset : $I_0 = 0$ no correction
 $I_0 > 0$ pastel effect :
clipping possibility to white
 $I_0 < 0$ darker image :
clipping possibility to black

Gain : $K = 1$ no correction
 $K > 1$ brighter image :
clipping possibility to white
 $K < 1$ darker image :
possibility of a "very" grey image

Offset + gain together :

$I_0 > 0$ and $K < 1$: pastel effect without clipping
to white.
 $I_0 < 0$ and $K > 1$: dark shadows without a very
grey image.

Gamma-correction :

$N = 1$ no correction
 $N > 1$ vivid colours
possibility of dark areas closing
 $N < 1$ smooth, faded colours
more details in darker areas.

APPENDIX II

M. ASCII TABLE

| DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR | DEC | HEX | CHAR |
|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|
| 0 | 00 | SPC | 32 | 20 | SPC | 64 | 40 | @ | 96 | 60 | . |
| 1 | 01 | "A | 33 | 21 | ! | 65 | 41 | A | 97 | 61 | a |
| 2 | 02 | "B | 34 | 22 | " | 66 | 42 | B | 98 | 62 | b |
| 3 | 03 | "C | 35 | 23 | " | 67 | 43 | C | 99 | 63 | c |
| 4 | 04 | "D | 36 | 24 | " | 68 | 44 | D | 100 | 64 | d |
| 5 | 05 | "E | 37 | 25 | " | 69 | 45 | E | 101 | 65 | e |
| 6 | 06 | "F | 38 | 26 | " | 70 | 46 | F | 102 | 66 | f |
| 7 | 07 | "G | 39 | 27 | " | 71 | 47 | G | 103 | 67 | g |
| 8 | 08 | "H | 40 | 28 | (| 72 | 48 | H | 104 | 68 | h |
| 9 | 09 | "I | 41 | 29 |) | 73 | 49 | I | 105 | 69 | i |
| 10 | 0A | "J | 42 | 2A | " | 74 | 4A | J | 106 | 6A | j |
| 11 | 0B | "K | 43 | 2B | + | 75 | 4B | K | 107 | 6B | k |
| 12 | 0C | "L | 44 | 2C | " | 76 | 4C | L | 108 | 6C | l |
| 13 | 0D | "M | 45 | 2D | " | 77 | 4D | M | 109 | 6D | m |
| 14 | 0E | "N | 46 | 2E | " | 78 | 4E | N | 110 | 6E | n |
| 15 | 0F | "O | 47 | 2F | / | 79 | 4F | O | 111 | 6F | o |
| 16 | 10 | "P | 48 | 30 | 0 | 80 | 50 | P | 112 | 70 | p |
| 17 | 11 | "Q | 49 | 31 | 1 | 81 | 51 | Q | 113 | 71 | q |
| 18 | 12 | "R | 50 | 32 | 2 | 82 | 52 | R | 114 | 72 | r |
| 19 | 13 | "S | 51 | 33 | 3 | 83 | 53 | S | 115 | 73 | s |
| 20 | 14 | "T | 52 | 34 | 4 | 84 | 54 | T | 116 | 74 | t |
| 21 | 15 | "U | 53 | 35 | 5 | 85 | 55 | U | 117 | 75 | u |
| 22 | 16 | "V | 54 | 36 | 6 | 86 | 56 | V | 118 | 76 | v |
| 23 | 17 | "W | 55 | 37 | 7 | 87 | 57 | W | 119 | 77 | w |
| 24 | 18 | "X | 56 | 38 | 8 | 88 | 58 | X | 120 | 78 | x |
| 25 | 19 | "Y | 57 | 39 | 9 | 89 | 59 | Y | 121 | 79 | y |
| 26 | 1A | "Z | 58 | 3A | : | 90 | 5A | Z | 122 | 7A | z |
| 27 | 1B | "[| 59 | 3B | : | 91 | 5B | [| 123 | 7B | [|
| 28 | 1C | "\ | 60 | 3C | < | 92 | 5C | \ | 124 | 7C | \ |
| 29 | 1D | "} | 61 | 3D | " | 93 | 5D | } | 125 | 7D | } |
| 30 | 1E | "~ | 62 | 3E | > | 94 | 5E | ~ | 126 | 7E | ~ |
| 31 | 1F | "_ | 63 | 3F | ? | 95 | 5F | _ | 127 | 7F | _ |