Printing with MorphOS (V1.5): (October 2020 , MorphOS V3.14)
by Bernd Assenmacher

Short introduction: What you need to know!

MorphOS uses Turboprint (V7.33 from 2003) as printer system.
Turboprint has only limited (and older) drivers in the MorphOS version.

Basically you can only print with the existing Turboprint printers. Due to the age of those printers this will be difficult.

The **PCL** printer driver included in Turboprint is therefore used to enlarge the range of printers.

Many applications in MorphOS often also issue **Postscript** code when printing.

Conclusion:

Ideally, printers used in MorphOS should be able to understand the printer languages

PCL <u>**and**</u> **Postscript**.

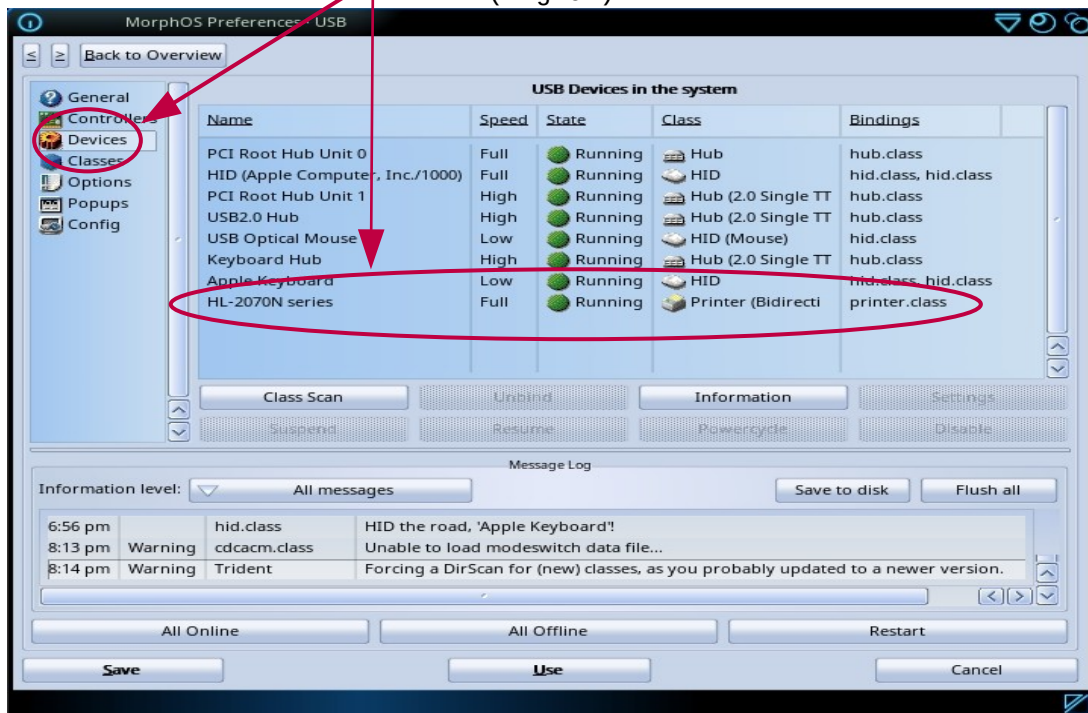### **Adjuster for printing with MorphOS**

To set up the printer(s) you need to use the following presetters in MorphOS Preferences:

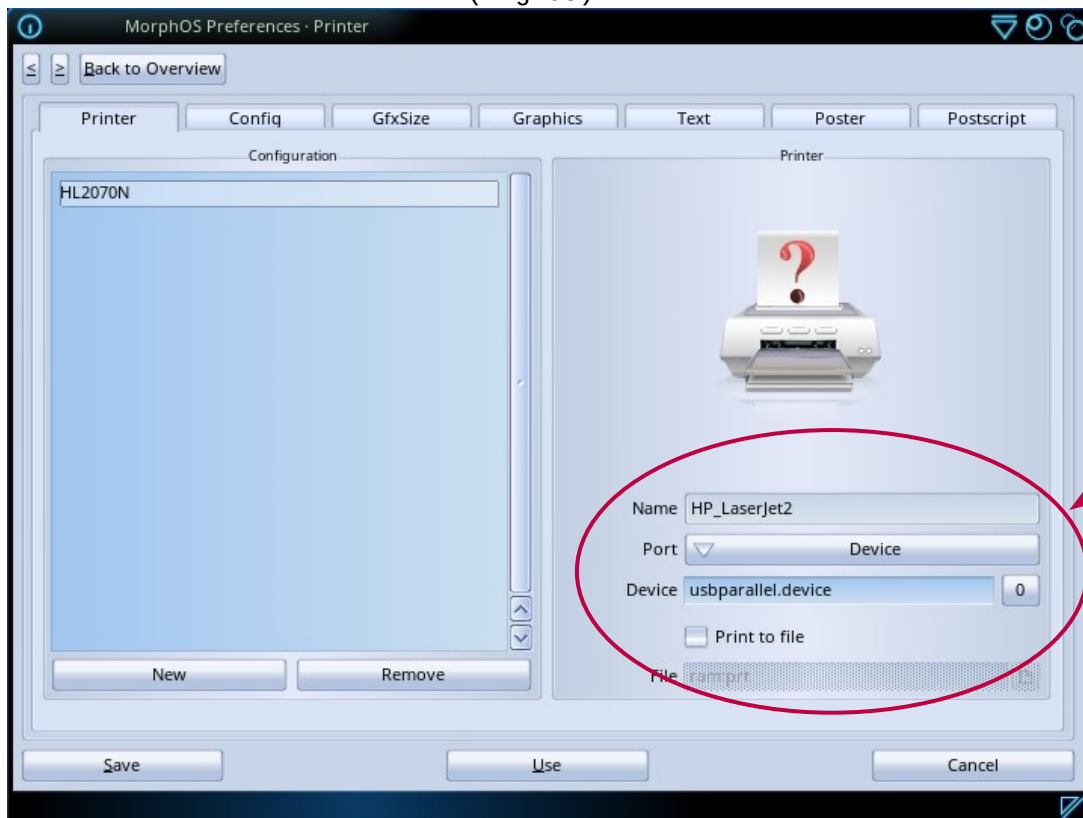(Fig.01)

USB printer with Turboprint:

In the USB presetter (Fig.01 → USB) in "Devices" tab (Fig.02) you can check
whether an USB printer has been detected or not.
(Fig.02)

Within "Printer" (not Printers) set (Fig.01+03):

- **New**
- **Select driver (e.g. HP_Laserjet2 for PCL printing)**
- **Assign name (printer name)**
- **Set Port to Device and enter "usbparallel.device"**
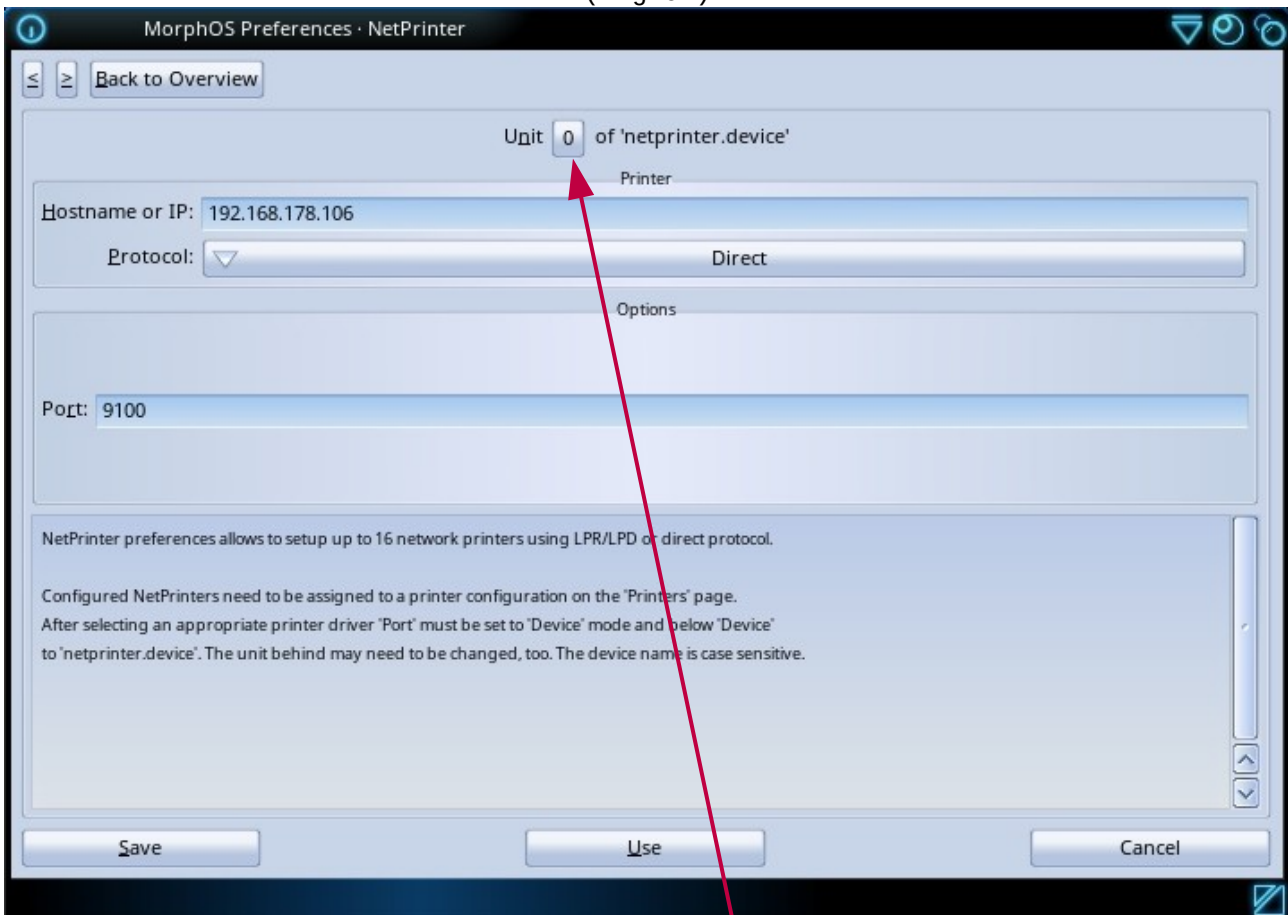- **Select Unit (e.g. 0)**
- **Save**

The (PCL) printer can now print via Turboprint and USB interface.
(Fig.03)

Network printer with Turboprint:

The "NetPrinter" package is already pre-installed in MorphOS.
Network printers have to be entered in Preferences within "NetPrinter"
presetter.(Fig.01 and Fig.04)

(Fig.04)

Up to 16 network printers (units 0-15) can be configured.
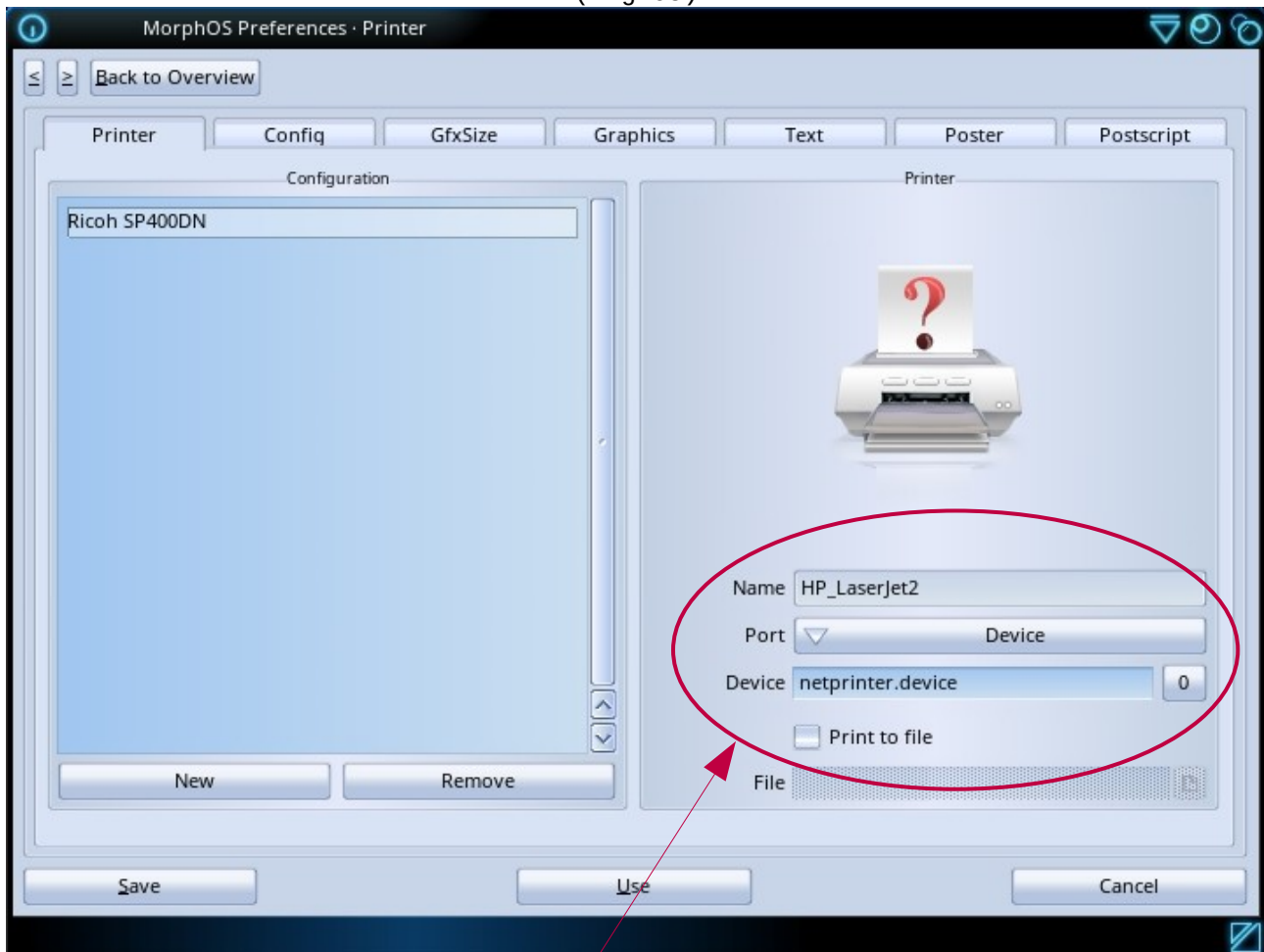
1. Set in "NetPrinter" presetter (Fig.01 and Fig.04):

- Unit: 0 (first (only) or additional printers)
- the IP of the printer e.g. 192.168.xxx.yyy (replace xxx and yyy accordingly)
- Protocol: Direct
- Port: 9100
- Save

Hint:

To set the unit, point to the unit number (Fig.04) and scroll up or down with
the mouse wheel.

2. Set in "Printer" presetter (not „Printers") (Fig.01 and Fig.05):

(Fig.05)

- *New*
- *Select driver (e.g. HP_Laserjet2 for PCL printing)*
- *Assign name (printer name)*
- *Set the port to Device and enter "netprinter.device"*
- *Select Unit (e.g. 0)*
- *Save*

The PCL-capable printer can now print with Turboprint over the network.

Hints:

To save the values in Turboprint, don't forget to press the Enter key, otherwise Turboprint "forgets" the settings.

If an error has crept into a configuration (write error or similar), delete the configuration (Remove) and reenter everything.
Changing an existing configuration does not work properly. (bug from TP)
If this doesn't work out, you can delete the corresponding „.tpc" file and the „_Last_" file in **Sys:MorphOS/TP/configs** and then reenter the configuration in "Printer". You need to reenter everything in "Postscript" tab too if you have to (see below :printing through **PS:** Device). Then press "Save".

In **MorphOS:TP/printers** you can e.g. copy the HP_Laserjet2.tpp file and save it in a (.tpp)file specific to the printer name. Then you can (after restart) select this file as a "driver" with your printer name.

Postscript printing via Turboprint for non-PS-capable printers (PCL-printers):

Turboprint prints bitmaps!

If you have a software that outputs postscript code, you can still print via a detour with **PS:** Device and Ghostscript using Turboprint on a PCL printer. For this to work, Ghostscript has to be installed.

How to install Ghostscript is described on page 14 in this tutorial.

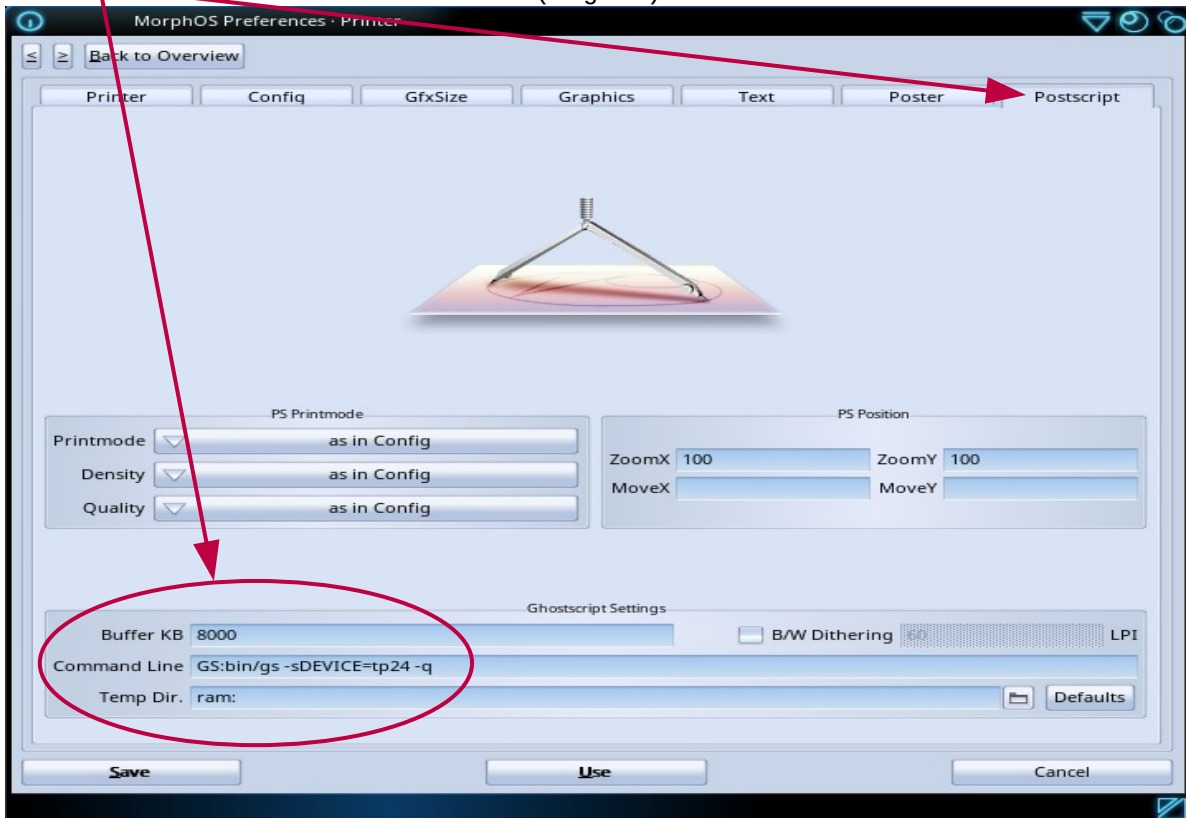Once installed one can configure Ghostscript :

The presetter for this is "Printer". (Fig.01 and Fig.06)
The above configuration must be done before. (Fig.03 or Fig.04/05)
In the "Postscript" tab the following settings should be entered:

- **Buffer KB: 1000** (set to 8000 for more "buffer storage")
- **Command Line: GS:bin/gs -sDEVICE=tp24 -q**
- **Temp.Dir: ram:**

(Fig.06)

Or set as **Temp Dir** e.g.: **Work:temp** (create the **Work:temp** directory before) if you need more space for the print job than the ram gives. It takes a little longer to print because of the writing process to the harddrive.

Everything else remains on "default".

Programs that issue (print) Postscript-code must print to the virtual device **PS:** created by Turboprint.

The **PS:** Device is provided by Turboprint at runtime.

If you now print to **PS:** device the postscript output of e.g. OWB or Pagestream is transferred to Turboprint, which uses Ghostscript to convert the PS code into a bitmap (raster) file, which is then printed on the printer using the Turboprint (PCL) driver.

Printing on Postscript printer without Turboprint:

With printers which do understand Postscript language you can print in MorphOS without Turboprint. The software has to support PS printing.

If using a network printer it has to be configured as already shown. (Fig.04)

Corresponding mountlist files must be created or copied into
MorphOS:Devs/DOSDrivers. (e.g. NETPAR, NETPAR0, NETPAR1 or USBPAR etc.)

The mountlist files NETPAR and USBPAR can be found in **MorphOS:Storage/DOSDrivers**
for use in **MorphOS:Devs/DOSDrivers**.

1st possibility: Direct printing to PS-printer

One can choose the mountlist files USBPAR and NETPAR in
MorphOS:Storage/DOSDrivers and copy them to **MorphOS:Devs/DOSDrivers**.

Change TYPE to "printer" in the files if it is set to "parallel".
The UNIT has to be set correctly.
In the example 0.

Example for *NETPAR:* or *USBPAR:*

- StackSize = 4096
- Priority = 5
- GlobVec = -1
- Handler = MOSSYS:L/port-handler
- Startup = "DEVICE=netprinter.device UNIT=0 TYPE=printer"

or

- Startup = "DEVICE=usbparallel.device UNIT=0 TYPE=printer"

The attributes "**readable**" and "**executable**" must be set in the icon.

Important: restart the computer! (to mount the devices)

Any software which supports it (e.g. OWB or VPDF) can now output (print) the Postscript code directly to the device specified in NETPAR or USBPAR and send it to the (PS-capable) printer.

To do this, select "Print" in the software and instead of *PS:* enter *NETPAR:* or *USBPAR:* (depending on where the printer is connected). If the printer prints, the device works.

The settings of the printer itself are adopted. (Format, resolution, etc.)

<div align="center">Hints:</div>

If printing is not possible directly from software, you may be able to take a detour via a file and then use software that can print it (does not always work, it is absolutely software dependent).

A Postscript file for example can be given to a printer with the shell by typing:

copy file.ps *NETPAR:* or **copy file.ps *USBPAR:***

(Where "file.ps" is the generated Postscript file and can of course be called differently.)

2nd possibility: PPD-printing - the new system

The introduction of the PPD system and the *PRINTER:* Device in MorphOS is meant to replace the Turboprint printing system in future.

The printout via "Printers" has nothing to do with the Turboprint settings ("Printer").

The PPD system sends print data (in conjunction with *PRINTER:* Device, l/printer-handler, the PPD-files and Ghostscript) in a printer-specific stream to the output path set in the presetter („Printers" Fig.01 + Fig.07) e.g. to *NETPAR:* or *USBPAR:* and thereby to the corresponding printer.

Ghostscript and PPD-filters are used internally for conversion of the print data.

The "Default printer" (*PRINTER:*) can be set (Fig.07) and the output thereby be directed to a device like *NETPAR:* or *USBPAR:* (output path) or a file (e.g. **ram: file.ps**) according to the printer profile.

If no "Default printer" is specified, the output to *PRINTER:* gets lost.

In the presetter "Printers" (Fig.01) (not "Printer") you can define printers by using PPD-files as drivers and e.g. enter *USBPAR:* or *NETPAR:* in the output path (Fig.07).

The mount files NETPAR or USBPAR in **MorphOS:Devs/DOSDrivers** must exist and be set accordingly (see above).

Network printers must also be set correctly using the "NetPrinter" adjuster (Fig. 04).

(Fig.07)
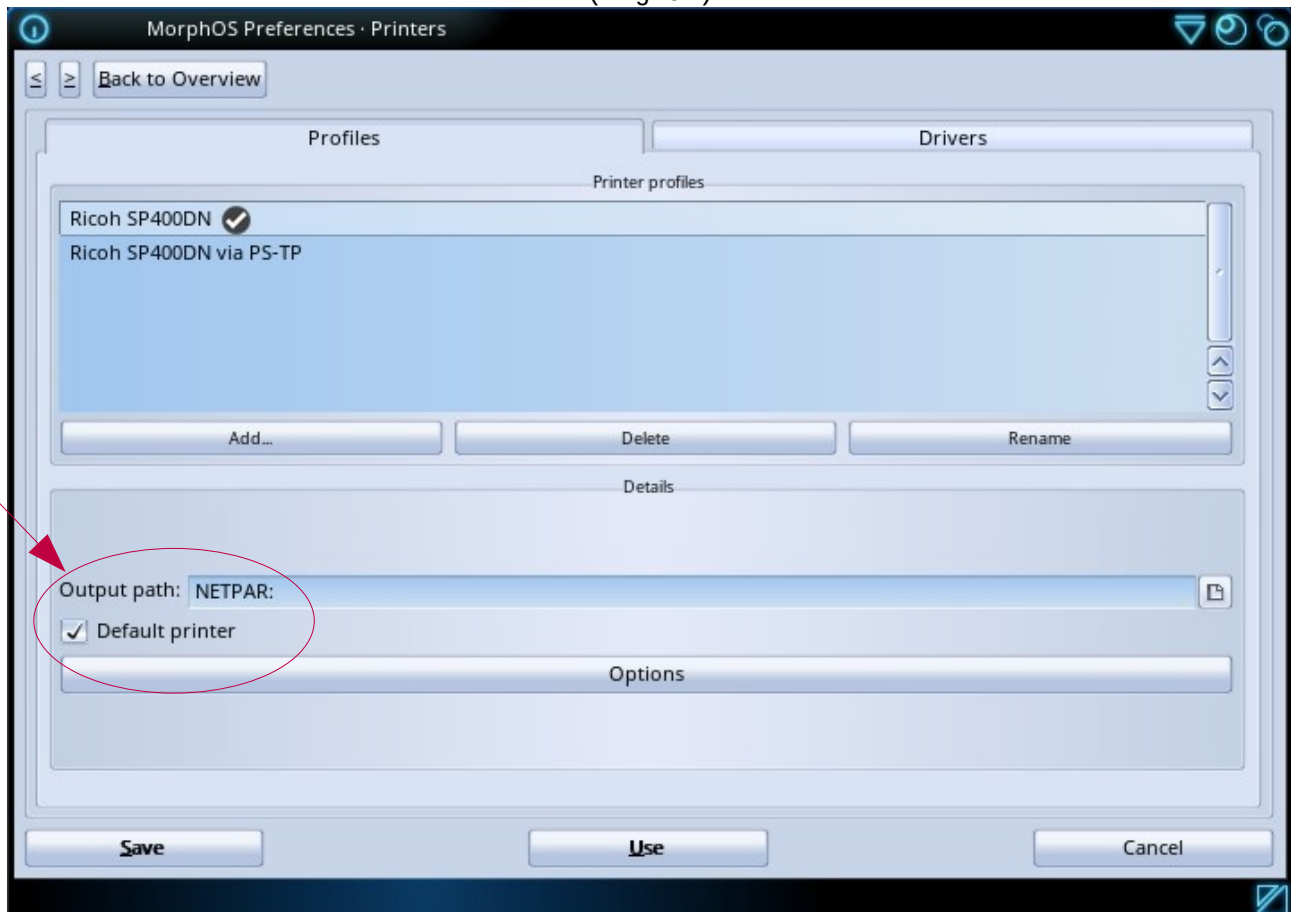
Many PPD files are available.

PPD files for Samsung printers can be found in this archive:

Some printers like Epson (EscP) and Samsung (CLP) can be found using the button "Search driver" in the Drivers tab and be added. (Fig.08)

The PPD files for those printers are in : **Sys:MorphOS/Data/Printers/PPD**

You can also get the PPD files from the printer manufacturer's website, the printer CD, or from Openprinting.

http://www.openprinting.org/printers/

PPD files for Postscript printers should work without problems.

PPD files for printers who cannot do Postscript (PCL/SPL/EscP) work with foomatic filters (or others). These filters translate the PS code into the corresponding printer (binary) code. You can recognize PPD files for PCL/SPL/EscP printers by the filter information inside the PPD file.

Annotation:
Postscript printers are working well at the moment. Other (PCL/EscP/SPL) printers do not always work due to the lack of filter support. As far as I know, it is being worked on. ;-)

(Fig.08)
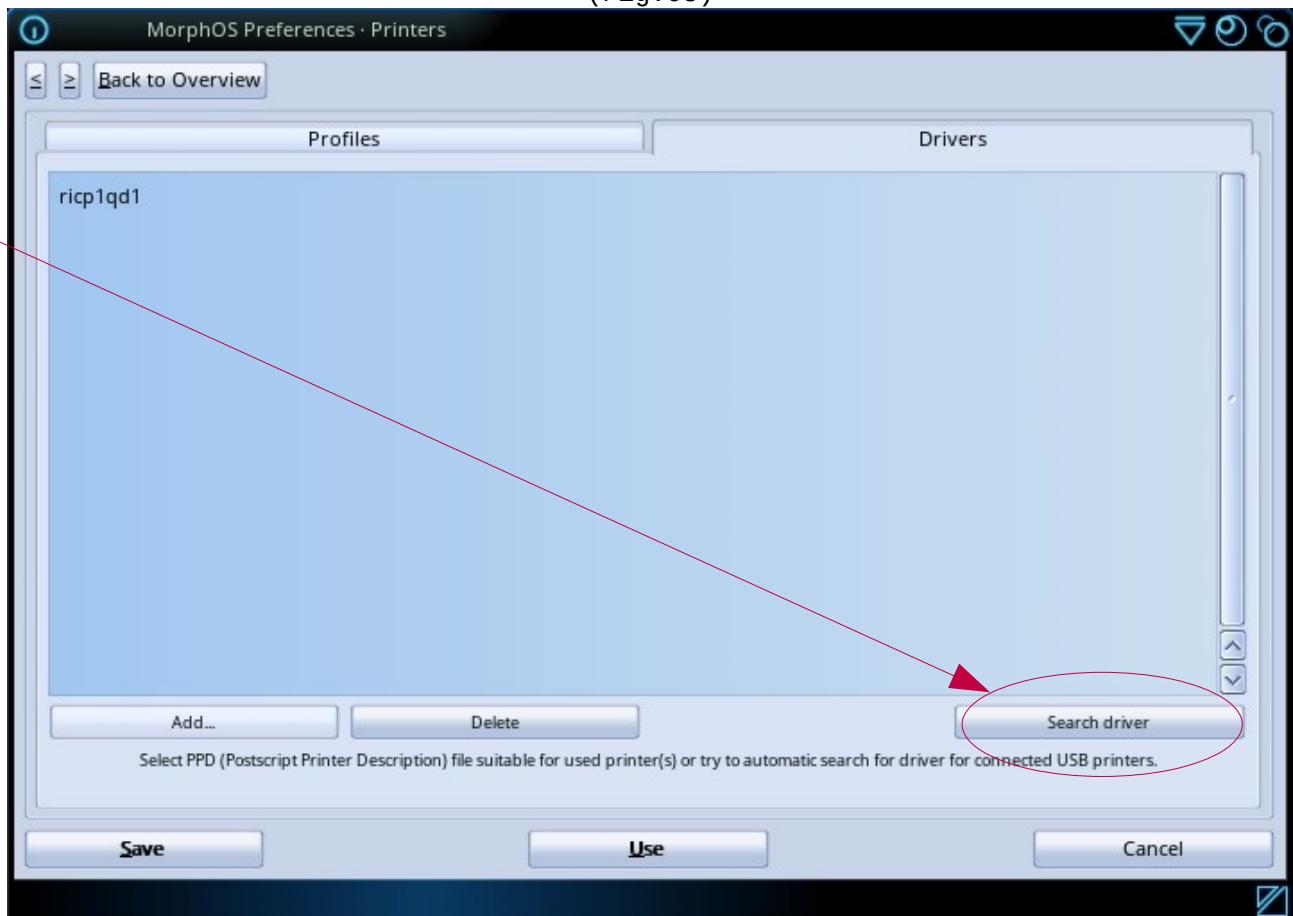
The PPD file is also needed to set the printer-preferences easily by the
"Printers" presetter and one does not have to go to the web interface (of a
network printer) via browser or to the printer itself.

(Fig.09)
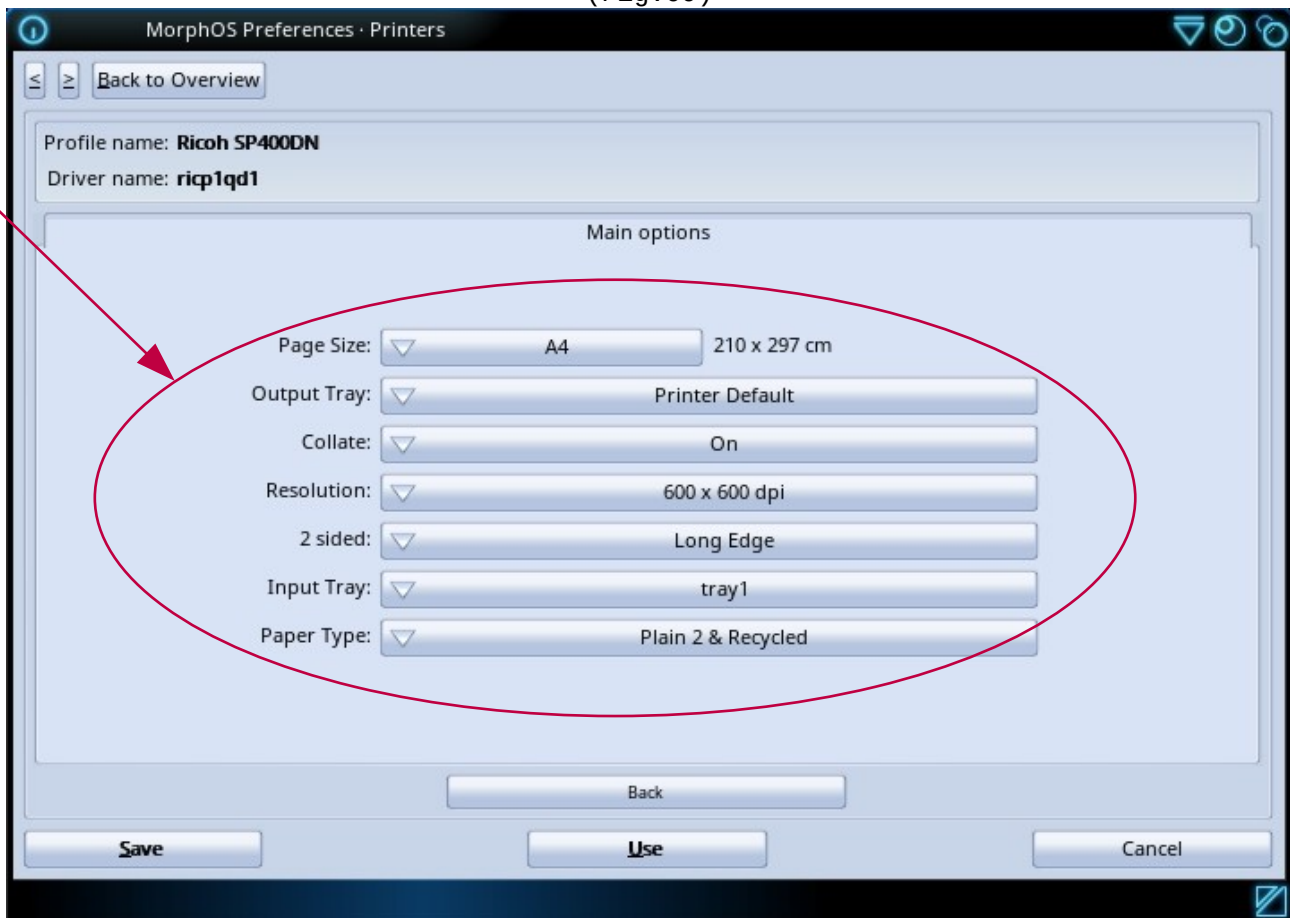
If the **direct** postscript printout works via the *NETPAR:* or *USBPAR:* Device but
not via the new PPD-system, the problem lies with the PPD-file or the
configuration in "Printers".

Here you can find another description to the new PPD-System :
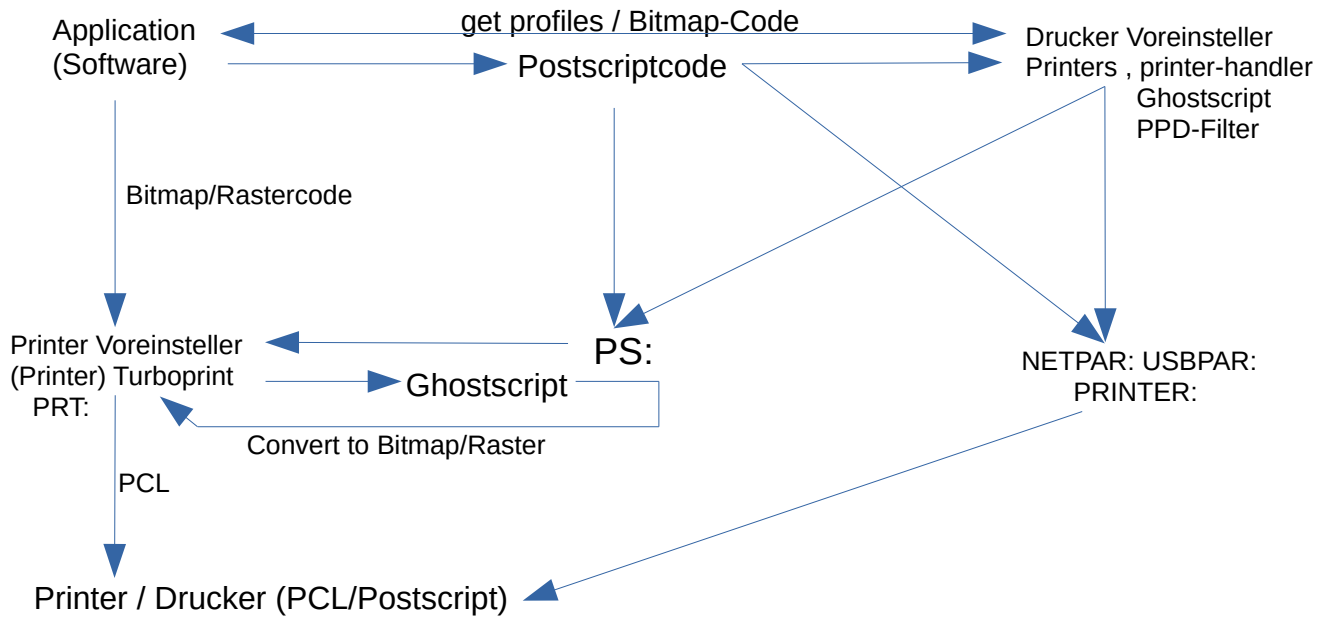
https://library.morph.zone/Print_System

Postscript printing with PPD files via "Printers" works with Ghostscript installed on the **PS:** Device even with printers that are not Postscript-capable (again via Turboprint). You can simply take a PPD driver from a Postscript printer of your choice, since the **PS:** Device only needs PS code that is converted with Ghostscript.
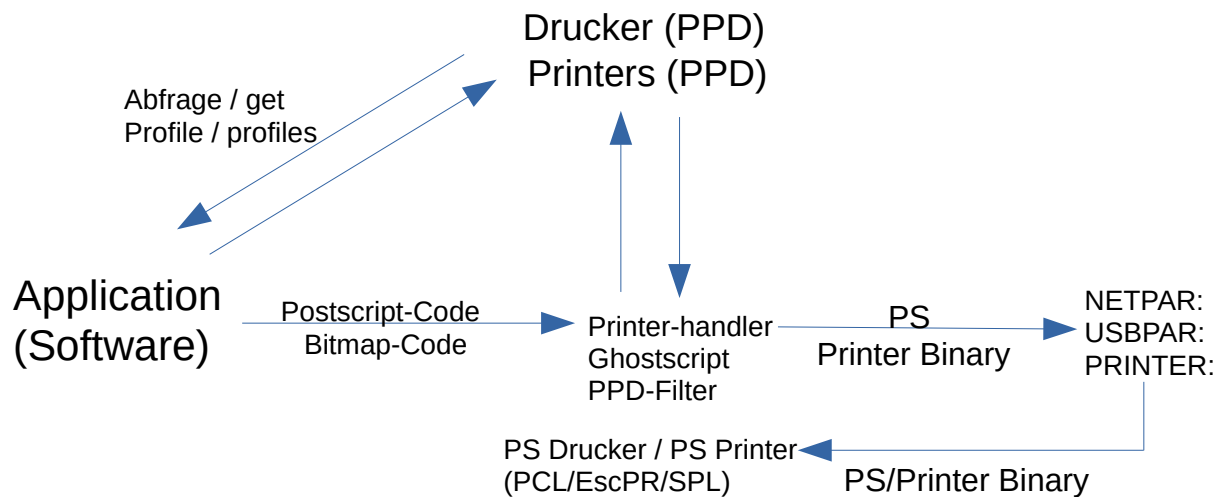

(Fig.10)
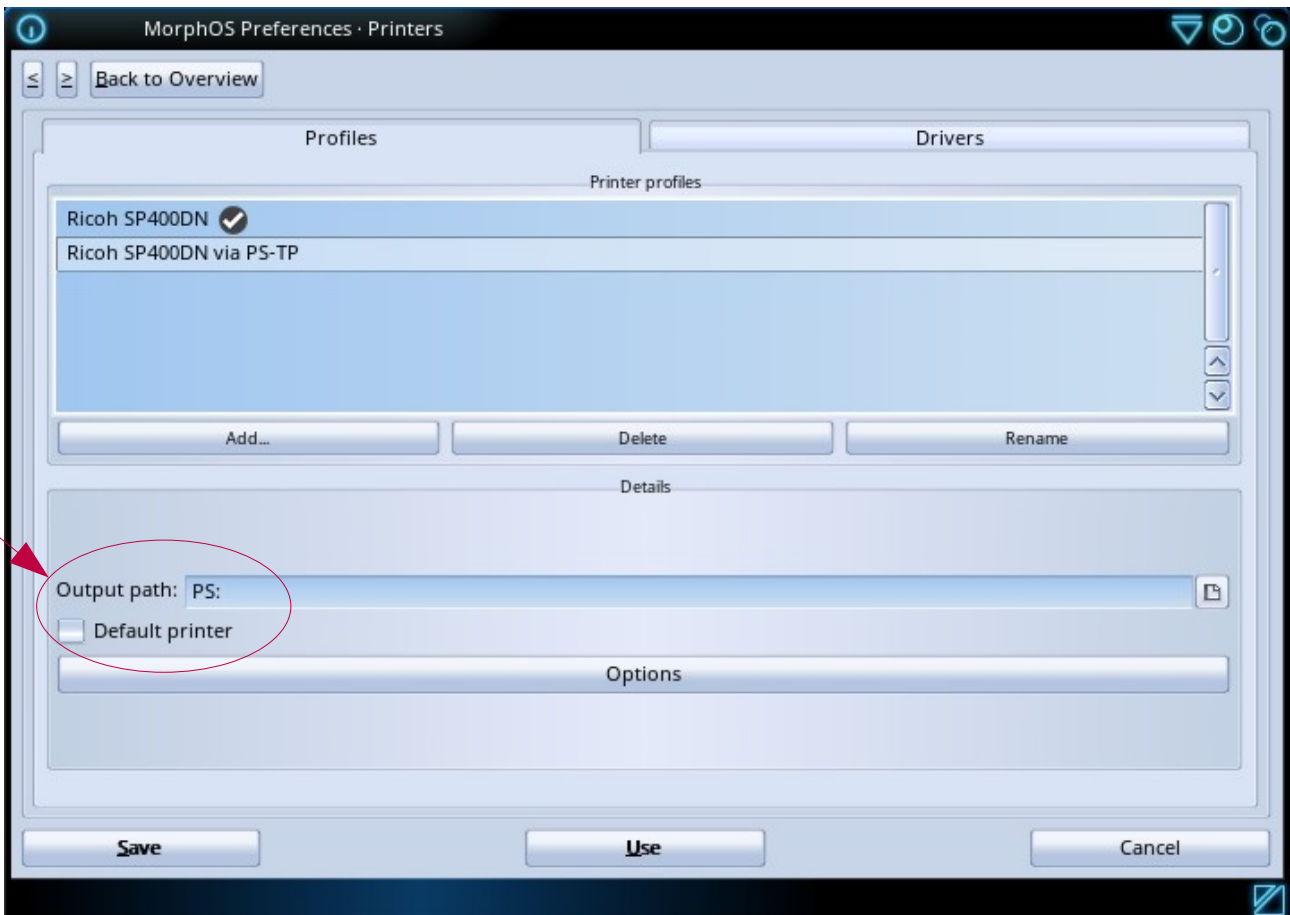
For easy clarification, the printing system with Turboprint <u>and</u> PPD-system is shown together in a graphic:

(Fig.11)

Application (Software) → get profiles / Bitmap-Code → Drucker Voreinsteller Printers , printer-handler Ghostscript PPD-Filter

Postscriptcode

Bitmap/Rastercode

Printer Voreinsteller (Printer) Turboprint PRT:

PS:

Ghostscript

Convert to Bitmap/Raster

PCL

NETPAR: USBPAR: PRINTER:

Printer / Drucker (PCL/Postscript)

Here is a representation of the PPD-system <u>without</u> Turboprint

(Fig.12)

Drucker (PPD)
Printers (PPD)

Abfrage / get Profile / profiles

Application (Software)

Postscript-Code
Bitmap-Code

Printer-handler
Ghostscript
PPD-Filter

PS
Printer Binary

NETPAR:
USBPAR:
PRINTER:

PS Drucker / PS Printer (PCL/EscPR/SPL)

PS/Printer Binary

<u>*Brief explanation of the PPD system:*</u>

The software queries the printer profiles from the PPD presetter.
The software sends a data stream. (PS or bitmap)
If necessary, the data stream is converted (PPD filter, ghostscript) and sent to the printer output path (**NETPAR:, USBPAR:, PRINTER:** etc.) as a PS or printer-specific binary stream.

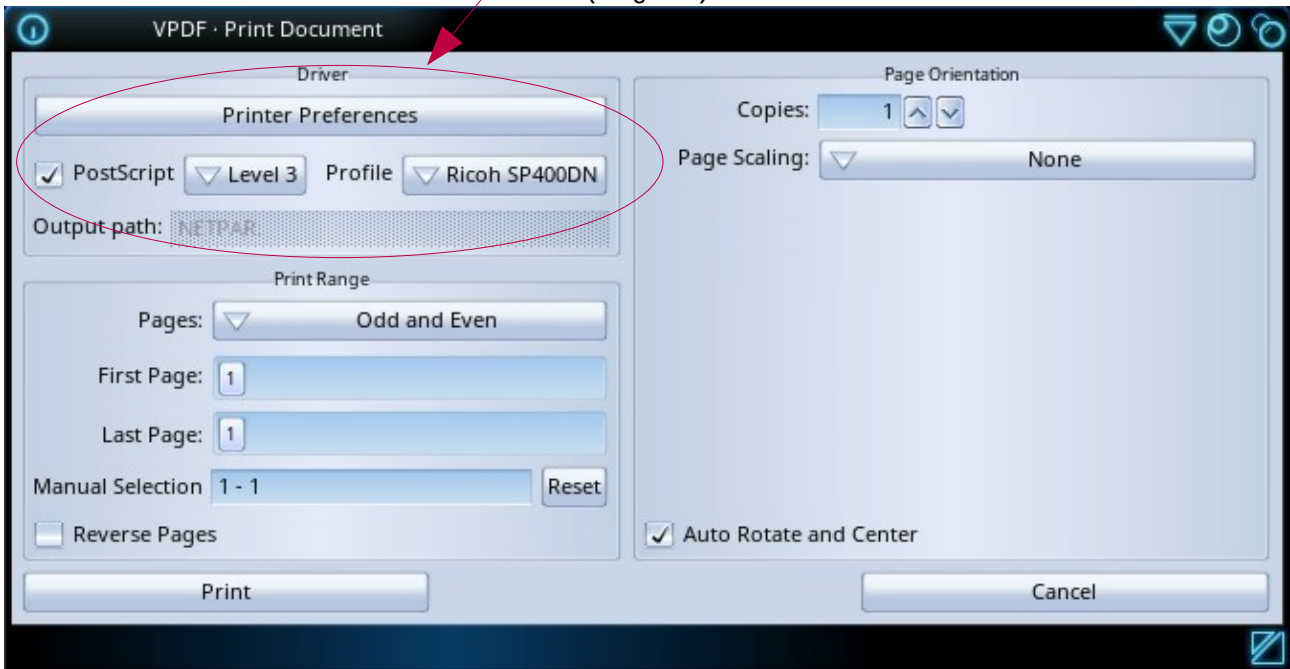Here is an example of printing to a file (***ram: file.ps***):
(Fig.13)
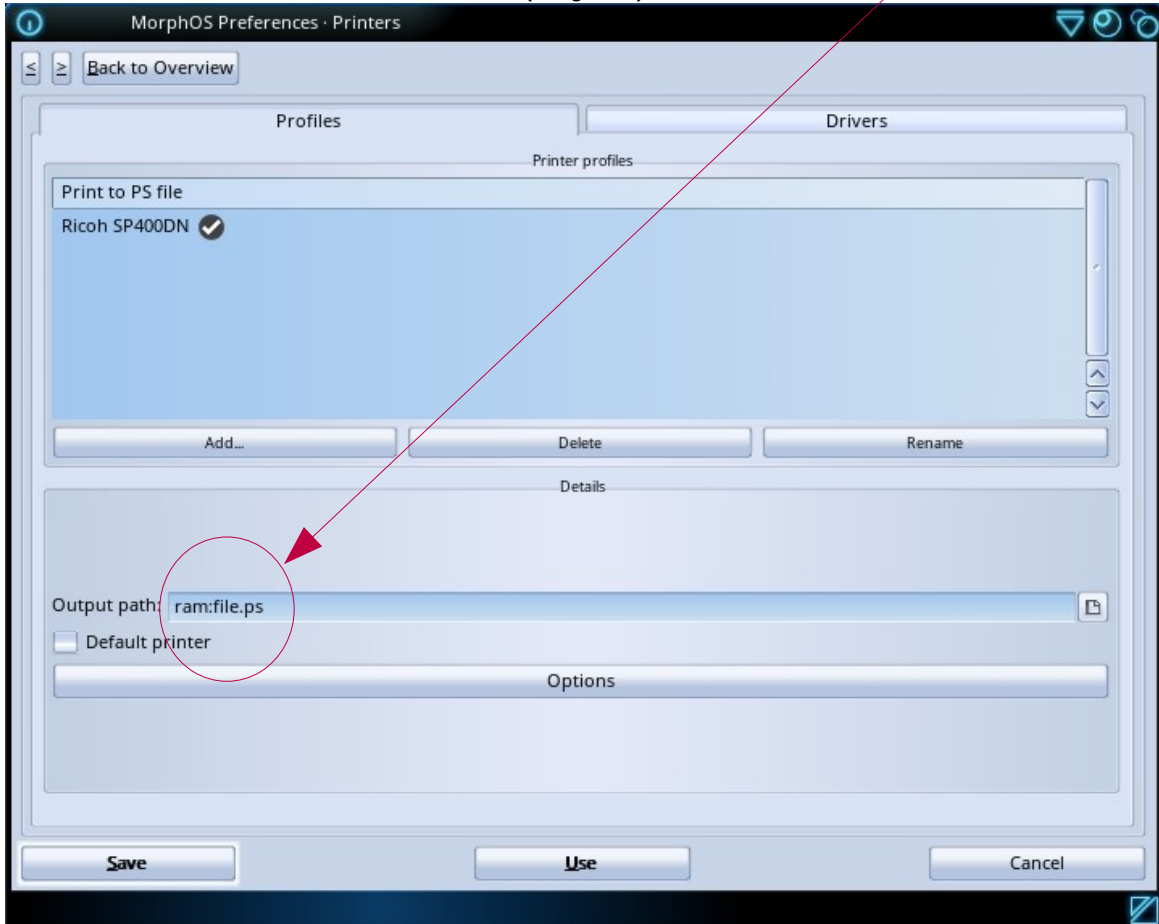
The FlowStudio and Vpdf applications already support printing via the new
PostScript-PPD-system.
(Fig.014)
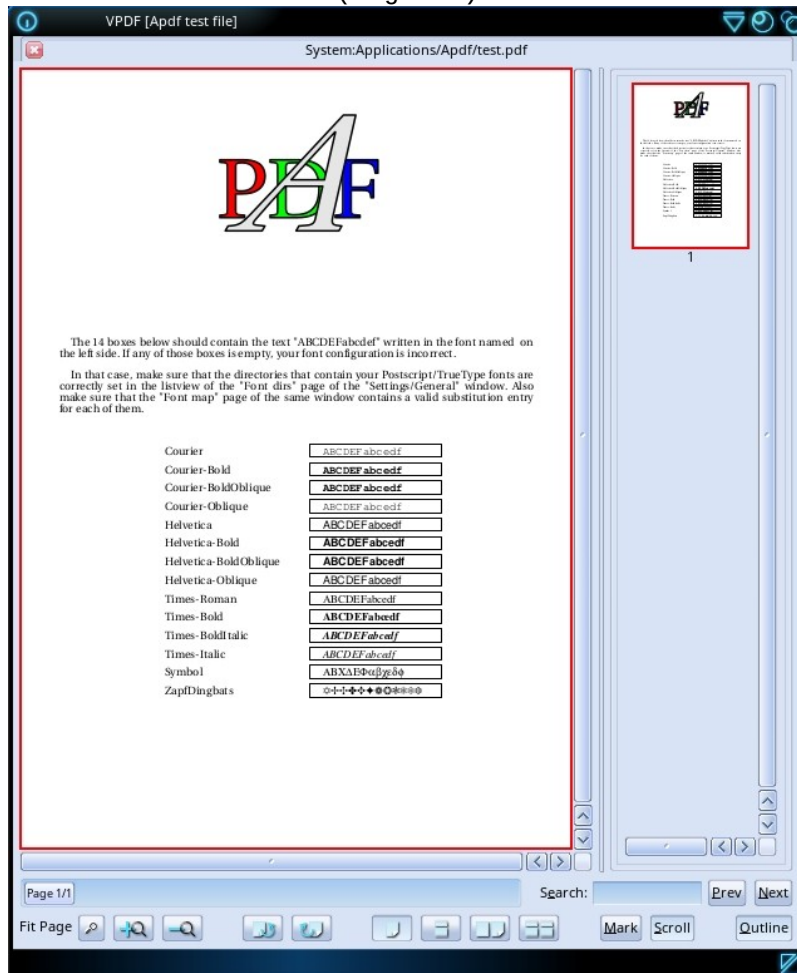
When PostScript is selected in the print dialog, the "Printers" presetter is also called up. (Printer Preferences)

(Fig.15)

Additional :(Ghostscript installation)

After installing MorphOS it is recommended to install the "Chrysalis" package, because it installs in addition many good software packages, classes and libraries that contribute well to the general function of the OS.

You can download it here:

(Note the version number matching the MorphOS version!)

https://www.morphos-storage.net/?page=Chrysalis

Ghostscript will also be installed with Chrysalis package.
The installation path is: **System:Applications_ext/Office/Ghostscript**

Ghostscript can be installed too by using Guido Mersmann's installer,if Chrysalis package is not used.

A functioning network connection is necessary for this to work :

http://geit.de/stupid/ghostscriptinstaller.lha
(also available in Aminet or MorphOS-Storage)

In the installer you can either select and install version 8.6 from Aminet or version 8.7 from the Whoosh777 website! Both work with the **PS:** Device.
Let the installer do the assigns and the Turboprint settings!

As another alternative, you can download the working archives from Ghostscript directly and follow the installation instructions.

Version 8.7 of the Whoosh website can be found here:

http://www.whoosh777.com/index.php?txt=1#install

You need the archives:

http://www.whoosh777.com/gs870core.lha
http://www.whoosh777.com/gsfonts.lha
http://www.whoosh777.com/gs870noixemul.lha

or download version 8.6 from Aminet:

http://aminet.net/text/dtp

Here you need the following archives:

http://aminet.net/text/dtp/gs860_core.lha
http://aminet.net/text/dtp/gs860_fonts.lha
http://aminet.net/text/dtp/gs860_nofpu.lha

Always restart the computer after Ghostscript or Chrysalis installation.

Ghostscript is also pre-installed in MorphOS 3.14. It is located in the **Sys:MorphOS/Data/Printers** directory with a reduced number of files.
If you put the assigns to this Ghostscript installation, this results in the ejection of a white sheet in the printer when printing to the **PS:** Device. This installation serves the function of the new PPD system, so just ignore it.

Hint:

To use the Ghostscript GUI one needs to edit the tooltypes of the GSGui application.

The app is located in **System:Applications_ext/Office/Ghostscript**

The entry which should be added is : **GSExe=Ghostscript:bin/gs**

The GS8 entry can be deleted.

Recommendations and conclusions:

If you have several printers in the system, it is advisable to configure only one printer in Turboprint. A printout via Turboprint (*PRT:*) is only ever carried out on the first printer in the "Printer Configuration" tab by the "Printer" adjuster.

I was unable to print to a second printer in the list. A PCL (USB or network) printer can work well as a (single) Turboprint printer. Additional printers can be available in the network or with USB and should (as of today) understand Postscript language. With appropriate mount lists and PPD files (see above), printouts on these are then possible without any problems.

If the filter support works in the new PPD-system for "non" Postscript printers, then these can also be used.

The printer system is being further developed in order to get as many printers as possible to function. Particular emphasis is placed on Postscript printers.

****
I wrote this guide to explain the printing system in MorphOS with simple words and examples if possible, because such a guide apparently did not exist (until today ;-)).

If errors, incomprehensible representations or missing details are noticed, I would like to know about it to improve it. :)

Thanks to the tireless MorphOS team.

Thanks also to Frank Mariak, who gave me important hints, to David Brunet (http://obligement.free.fr), who has translated this tutorial into the French language and draws my attention to errors and possible improvements :-), to Guido Mersmann (http://geit.de/) for the wonderful ghostscript installer ;-) and to Yannick Buchy (Papiosaur) for his efforts on MorphOS Storage. :-)
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