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This file, use.doc, describes how to use the Ghosts
interpreter.

For an overview of Ghostscript and a list of the do
README.

********
******** How to use the Ghostscript interpreter ***
********

The file name of the Ghostscript interpreter is gs.
gs (Unix).  To run it, you also need some external
        gs_*.ps (gs_2asc.ps, gs_dps1.ps,
                 gs_fonts.ps, gs_init.ps, gs_lev2.p
        sym__enc.ps
        uglyr.gsf

Fontmap
as well as any other fonts from the Ghostscript dis
.pfa files).

To invoke the interpreter, give the command
        gs <filename1> ... <filenameN>
The interpreter will read in the files in sequence
After doing this, it reads further input from the p
(normally the keyboard).  Each line (i.e. character
interpreted separately.  To exit from the interpret
The interpreter also exits gracefully if it encount
Typing the interrupt character, e.g., control-C, is

The interpreter recognizes several switches describ
anywhere in the command line and apply to all files

You can get a help message by invoking Ghostscript
        gs -h
or
        gs -?
This message also lists the available devices.  For
information, a one-line description of each device
beginning of the file devs.mak.

Choosing the output device
--------------------------

Ghostscript may be built with multiple output devic
normally opens the first one and directs output to
as the initial output device, include the switch
        -sDEVICE=xyz
in the command line.  Note that this switch must pr
file, and only its first invocation has any effect.
printer output in a normal configuration that inclu
driver, you might use the shell command
        gs -sDEVICE=epson myfile.ps
instead of just

```
        gs myfile.ps
```
Alternatively, you can type
```
        (epson) selectdevice
        (myfile.ps) run
```
All output then goes to the printer instead of the
notice.  You can switch devices at any time by usin
procedure, e.g.,
```
        (vga) selectdevice
```
or
```
        (epson) selectdevice
```
As yet a third alternative, you can define an envir
GS_DEVICE as the desired default device name.  The
these alternatives, highest to lowest, is:
```
        selectdevice
        (command line)
        GS_DEVICE
        (first device in build list)
```

To select the density on a printer, use
```
        gs -sDEVICE=<device> -r<xres>x<yres>
```
For example, you can get the lowest-density (fastes
```
        gs -sDEVICE=epson -r60x60
```
the highest-density 9-pin mode with
```
        gs -sDEVICE=epson -r240x60
```
and the highest-density 24-pin mode with
```
        gs -sDEVICE=epson -r360x180
```

If you select a printer as the output device, Ghost
to control where the device sends its output.  Norm
directly to the printer (PRN) on MS-DOS systems, an
Unix or VMS systems.  To send the output to a serie
foo2.xyz, ..., use the switch
```
        -sOUTPUTFILE=foo%d.xyz
```
The %d is a printf format specification; you can us
%02d.  Each file will receive one page of output.
the output to a single file foo.xyz, with all the p
the switch

```
        -sOUTPUTFILE=foo.xyz

On Unix systems, you can send the output directly t
output to the command printit, use the switch
        -sOUTPUTFILE=\|printit

To find out what devices are available, type
        devicenames ==

File searching
--------------

When looking for the initialization files (gs_*.ps)
fonts, or the file for the 'run' operator, Ghostscr
the file with the name as given (i.e., using the cu
if none is specified).  If this fails, and the file
an explicit directory or drive (i.e., doesn't begin
systems; doesn't contain a ':' or begin with a '/'
systems; doesn't contain a ':' or a square bracket
Ghostscript will try directories in the following o

        - The directory/ies specified by the -I swi
          line (see below), if any;

        - The directory/ies specified by the GS_LIB
          if any;

        - The directory/ies specified by the GS_LIB
          Ghostscript makefile, if any.

Each of these (GS_LIB_DEFAULT, GS_LIB, and -I param
single directory, or a list of directories separate
appropriate for the operating system (':' on Unix s
systems, ';' on MS-DOS systems).

VMS-specific notes
------------------
```

On VMS systems, the last character of each "directo
sort of entity the "directory" references.  If the
with a colon, it is taken as referring to a logical
        $ DEFINE GHOSTSCRIPT_DEVICE DUA1:[GHOSTSCRI
        $ DEFINE GS_LIB GHOSTSCRIPT_DEVICE:
If the "directory" name ends with a closing square
referring to a real directory, e.g.:
        $ DEFINE GS_LIB DUA1:[GHOSTSCRIPT]

To run Ghostscript with switches, you must type a c

        $ gs "-dNODISPLAY"

because the C run time library will convert the com
parameters/arguments to lowercase unless you enclos
which preserves the case.

If you are on an X Windows display (for which gs is

        $ set display/create/node="domain-name"/tra

For example,

        $ set display/create/node="doof.city.com"/t

and then run Ghostscript

        $ gs

MS-DOS notes
------------

If you are running Ghostscript on a MS-DOS machine
that is not EGA/VGA compatible, you must use the Bo
You must build Ghostscript with the BGI driver as t
you will need the appropriate .BGI file from the Bo

library.  (Ghostscript includes the EGA/VGA driver
executable.)

If you are using the BGI driver, two additional env
become relevant:

        BGIPATH - defines the directory where Ghost
the appropriate BGI driver.  If BGIPATH is not defi
look in the directory defined as BGIDIR in the make
if no driver is found in the designated directory,
in the current directory.

        BGIUSER - a string of the form nn.dname, wh
number giving a display mode and dname is the name
user-supplied BGI driver.  If BGIUSER is defined ar
selected, Ghostscript will supply nn as the display
the driver from the file named dname.

Some applications, such as Microsoft Word, require
the PostScript files they output.  In the case of W
*.ini files included with the Word distribution.  C
require other prologues.  These may be specified on
command line, e.g.,
        gs prologue.ini myfile.ps

X Windows resources
-------------------

Ghostscript looks for the following resources under
"Ghostscript":

        borderWidth - the border width in pixels
                default = 1
        borderColor - the name of the border color
                default = black
        geometry - the window size and placement, W
                default = ???

```
        xResolution - the number of x pixels per in
                default is computed from WidthOfScr
        yResolution - the number of y pixels per in
                default is computed from HeightOfSc

To set these resources, put them in a file (such as
following form:

Ghostscript*geometry:   612x792-0+0
Ghostscript*xResolution: 72
Ghostscript*yResolution: 72

Then load the defaults into the X server:

% xrdb -merge ~/.Xdefaults

Normal switches
---------------

        -- filename arg1 ...
                Takes the next argument as a file n
                all remaining arguments (even if th
                form of switches) and defines the n
                userdict (not systemdict) as an arr
                *before* running the file.  When Gh
                executing the file, it exits back t

        -Dname=token
        -dname=token
                Define a name in systemdict with th
                The token must be exactly one token
                'token' operator) and must not cont

        -Dname
        -dname
                Define a name in systemdict with va
```

-Sname=string
-sname=string
Define a name in systemdict with a
This is different from -d. For exa
-dname=35
is equivalent to the program fragme
/name 35 def
whereas
-sname=35
is equivalent to
/name (35) def

-q
Quiet startup -- suppress normal st
and also do the equivalent of -dQUI

-gnumber1xnumber2
Equivalent to -dDEVICEWIDTH=number1
-dDEVICEHEIGHT=number2. This is fo
devices (such as X11 windows and VE
(or allow) width and height to be s

-rnumber1xnumber2
Equivalent to -dDEVICEXRESOLUTION=r
-dDEVICEYRESOLUTION=number2. This
devices (such as printers) that sup
X and Y resolutions.

-Idirectories
Adds the designated list of directo
search path for library files.

-
This is not really a switch. It ir
that the standard input is coming f
Ghostscript reads from stdin until
executing it like any other file, a

processing the command line. At th
line, Ghostscript exits rather thar
interactive mode.

Note that gs_init.ps makes systemdict read-only, sc
defined with -D/d/S/s cannot be changed (although,
superseded by definitions in userdict or other dict

## Special names

-dASCIIOUT
disables Ghostscript's normal behavior; ins
stdout that would have been displayed or printed.
see the file gs_2asc.ps.

-dDISKFONTS
causes individual character outlines to be
the first time they are encountered. (Normally Gho
character outlines when it loads a font.) This may
fonts into RAM, at the expense of slower rendering.

-dNOBIND
disables the 'bind' operator. Only useful

-dNOCACHE
disables character caching. Only useful fo

-dNODISPLAY
suppresses the normal initialization of the
may be useful when debugging.

-dNOPAUSE
disables the prompt and pause at the end of
be desirable for applications where another program
Ghostscript.

-dWRITESYSTEMDICT
        leaves systemdict writable.  This is necess
special utility programs such as font2c and pcharst
normal PostScript access protection.

-sDEVICE=device
        selects an alternate initial output device,

-sOUTPUTFILE=filename
        selects an alternate output file (or pipe)
device, as described above.

Debugging switches
------------------

The -Z switch only applies if the interpreter was b
debugging configuration (DEBUG=1 or -DDEBUG selecte
time).

        -A      Turn on allocator debugging (gs_mal

        -e      Turn on tracing of error returns fr

        -E      Abort when any operator returns wit

        -Mn     Force the interpreter's allocator t
                memory in units of nK, rather than
                20K on MS-DOS systems, 50K on Unix)
                decimal integer (not exceeding 63 c

        -Zxxx   Turn on debugging printout.
                Each of the xxx characters selects
                if the string is empty, all options
                Case is significant.
                        0 = type 1 path tracer (typ
                        1 = type 1 font interpreter
                        2 = curve subdivider

```
a = allocator (large blocks
  A = allocator (all calls)
b = bitmap image processor
  B = bitmap images, detail
c = color/halftone mapper
d = dictionary put/undef
f = fill algorithm (summary
  F = fill algorithm (detai
h = halftone renderer
i = interpreter, just names
  I = interpreter, everythi
k = character cache
  K = character cache, ever
l = command lists, bands
  L = command lists, everyt
m = makefont and font cache
n = name lookup (new names
o = outliner (stroke)
p = path tracer
q = clipping
r = arc renderer
s = scanner
t = tiling algorithm
u = undo saver (for save/re
  U = undo saver, more deta
v = rectangle fill
  V = device-level output
w = LZW encoder/decoder
x = transformations
```