# Dynamic Printer Forms

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## Abstract

This presentation will show how Valtek easily eliminated costly pre-printed forms by using HP LaserJet overlays. This allows Valtek to design our own printer forms with company logos, etc. for Oracle reports. Valtek saves thousands of dollars by not purchasing pre-printed forms.

## Introduction

Valtek is a manufacturing company that makes control valves. We have been using an HP3000 for 17 years running VALPAC, an in-house hybrid version of ASK MANMAN software. This year we have converted to Oracle 10.4 running on an NCR 3450 with unix for the Operating System ( OS ). One of the many issues in converting has been pre-printed forms, i.e.: Invoices, Purchase Orders, Customer Acknowledgments, Packing Slips, Customer Statements, etc. We have not used pre-printed forms for 10 years ( except for W2s, 1099s, and checks ). We have been printing our own forms along with data on HP LaserJet printers using the overlay macro feature of these printers.

Beginning with the LaserJet II, HP's Printer Control Language ( PCL ), has had the feature of defining macros that are stored in the printer. A PCL macro is a group of PCL commands and/or data that can be invoked again and again by a single PCL command[1]. A macro can be invoked by a PCL command in the printing document or declared as an automatic overlay that is executed as the final operation each time a page is printed.

To print from unix, the 'lp' command is issued with various switches or options to alter the default printing environment. The overlay is a file that has to be sent to the printer before the document's data. We chose to alter the unix print model script to have an overlay option, which can easily be specified in the Oracle printer definition.

This overlay implementation plan has 3 parts.

1. Oracle Printers
   Change or add printer definitions for overlay support to your Oracle applications.

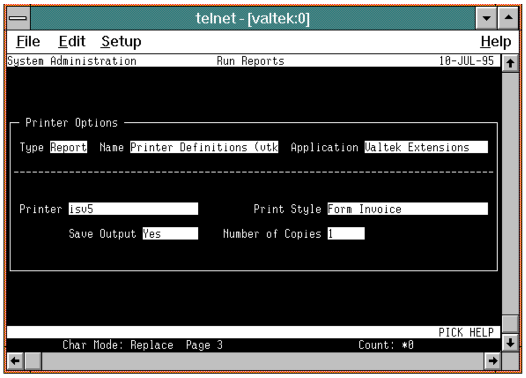
2. Unix Connection
   Create a directory structure for storage of overlay files.
   Modify the printing interface script to support the overlay feature.

3. Graphical Overlays
   Create the overlay with a graphic program and print it to a file.
   Edit the file to remove and change unwanted PCL commands.

Because my experience with unix and Oracle is short, what I review and explain may not be quite correct, but is as I have learned and understand so far.

## Part 1: Oracle Printers

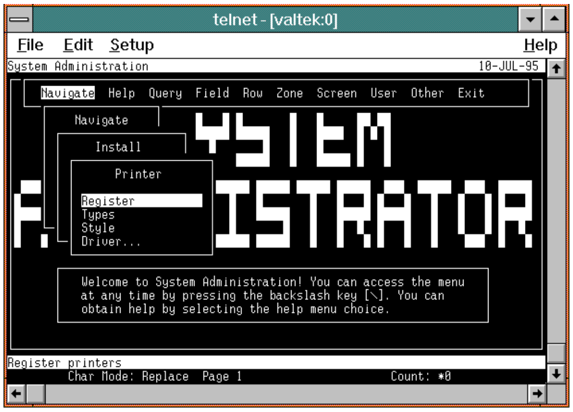
When users submit reports (figure O1), they must select a printer and a style. The printer determines a printer type. The type and the style determine which printer driver to use.



```
System Administration              Run Reports                     10-JUL-95

 Printer Options
  Type Report  Name Printer Definitions (vtk  Application Valtek Extensions
 -------------------------------------------------------------------------

  Printer isv5                        Print Style Form Invoice
        Save Output Yes            Number of Copies 1

                                                                  PICK HELP
          Char Mode: Replace  Page 3                       Count: *0
```

Figure O1

Printer setup is under the responsibility of System Administration[2]. The navigation path is: \ **N**avigate **I**nstall **P**rinter (figure O2).The following 6 steps are used to define a printer and its driver.

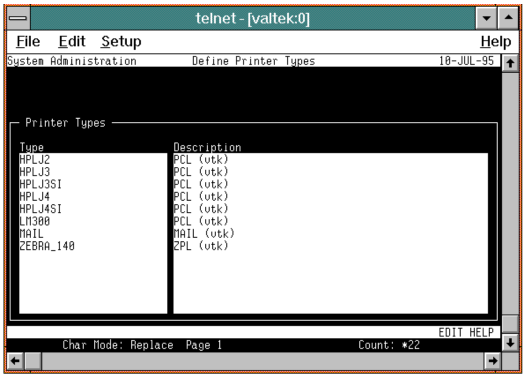


```
System Administration                                              10-JUL-95

  Welcome to System Administration! You can access the menu
  at any time by pressing the backslash key [\]. You can
  obtain help by selecting the help menu choice.

Register printers
       Char Mode: Replace  Page 1                   Count: *0
```

Figure O2   Path: \ **N**avigate **I**nstall **P**rinter

### Step 1: Define printer types

Grouping printers by types allows you to specify a single driver for many printers. Figure O3 shows several types we have defined.

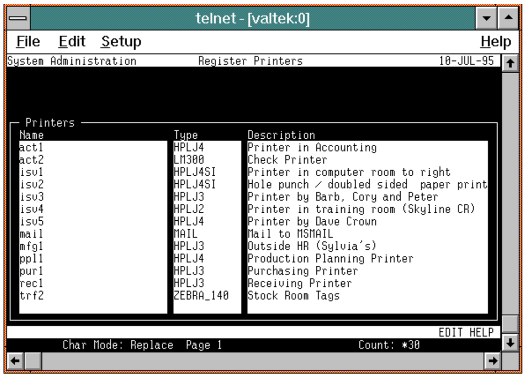


```
System Administration          Define Printer Types                10-JUL-95

 Printer Types
  Type                 Description
  HPLJ2                PCL (vtk)
  HPLJ3                PCL (vtk)
  HPLJ3SI              PCL (vtk)
  HPLJ4                PCL (vtk)
  HPLJ4SI              PCL (vtk)
  LM300                PCL (vtk)
  MAIL                 MAIL (vtk)
  ZEBRA_140            ZPL (vtk)

                                                                   EDIT HELP
       Char Mode: Replace  Page 1                   Count: *22
```

Figure O3   Path: \ **N**avigate **I**nstall **P**rinter Types

### Step 2: Register Printer devices

Printers are defined by name, usually using the name from your OS, and given a type. Figure O4 has examples of printers we placed in various departments.



```
System Administration          Register Printers                   10-JUL-95

 Printers
  Name                 Type         Description
  act1                 HPLJ4        Printer in Accounting
  act2                 LM300        Check Printer
  isv1                 HPLJ4SI      Printer in computer room to right
  isv2                 HPLJ4SI      Hole punch / doubled sided  paper print
  isv3                 HPLJ3        Printer by Barb, Cory and Peter
  isv4                 HPLJ2        Printer in training room (Skyline CR)
  isv5                 HPLJ4        Printer by Dave Crown
  mail                 MAIL         Mail to MSMAIL
  mfg1                 HPLJ3        Outside HR (Sylvia's)
  ppl1                 HPLJ4        Production Planning Printer
  pur1                 HPLJ3        Purchasing Printer
  rec1                 HPLJ3        Receiving Printer
  trf2                 ZEBRA_140    Stock Room Tags

                                                                   EDIT HELP
       Char Mode: Replace  Page 1                   Count: *30
```

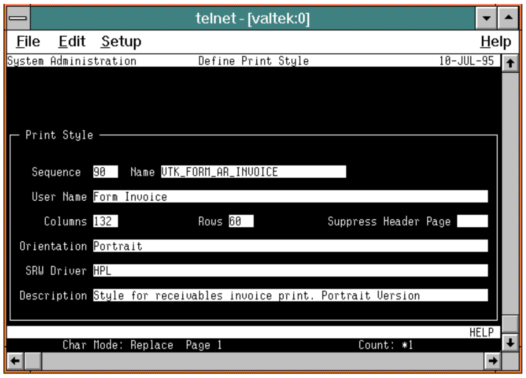
Figure O4   Path: \ **N**avigate **I**nstall **P**rinter Register

### Step 3: Define Printer Styles

A style describes paper orientation, lines and columns per page, and the SQL*ReportWriter ( SRW ) driver file (figure O5). Reports can be registered to Oracle with minimum and/or maximum rows and/or columns that will determine the styles that are valid selections for the report. Please note that the user name on this form is what the user will see when selecting a style. Also note that the default SRW driver is for a DEC printer. In the srw directory:

/10.4/fnd/6.0.24/srw

I found printer files named HPP.prt, HPL.prt, HPW.prt that support PCL codes for the bold and underline features.

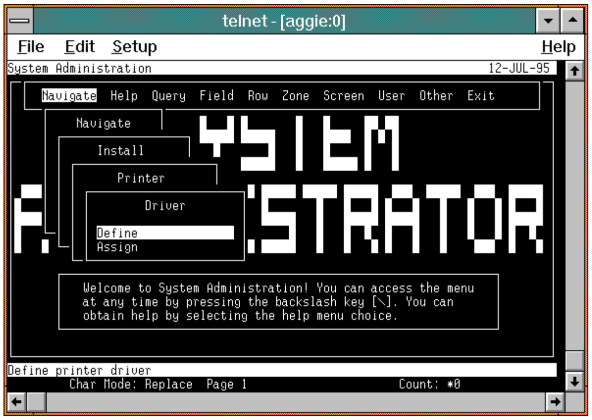


```
System Administration          Define Print Style                  10-JUL-95

 Print Style

    Sequence 90    Name UTK_FORM_AR_INVOICE

   User Name Form Invoice

     Columns 132            Rows 60           Suppress Header Page

 Orientation Portrait

  SRW Driver HPL

 Description Style for receivables invoice print. Portrait Version

                                                                        HELP
       Char Mode: Replace  Page 1                   Count: *1
```

Figure O5   Path: \ **N**avigate **I**nstall **P**rinter **S**tyles

### Step 4: Define Printer Drivers

A driver describes the actual interface from Oracle to your OS. The navigation path to drivers is \ **N**avigate **I**nstall **P**rinter **D**river (figure O6).



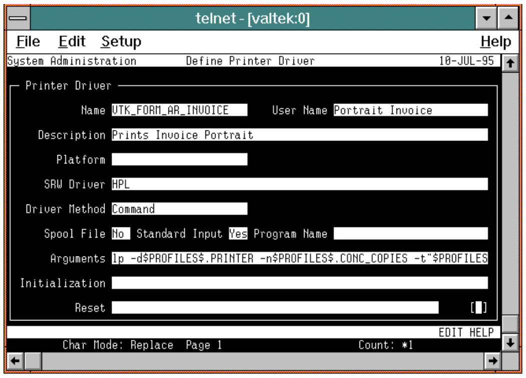
```
System Administration                                              12-JUL-95

  Welcome to System Administration! You can access the menu
  at any time by pressing the backslash key [\]. You can
  obtain help by selecting the help menu choice.

Define printer driver
       Char Mode: Replace  Page 1                   Count: *0
```

Figure O6   Path: \ **N**avigate **I**nstall **P**rinter **D**river

Choose **D**efine (figure O7) This shows that we have selected the command method and have the driver issue a specific unix command. Note the unix command in the argument field with the parameters that Oracle will provide. In figure O8, the path \ **F**ield **E**dit, has been done to see the complete argument field. Note the 4 switches that are passed to the 'lp' command as options. The last 3 are defined features in the original model script:

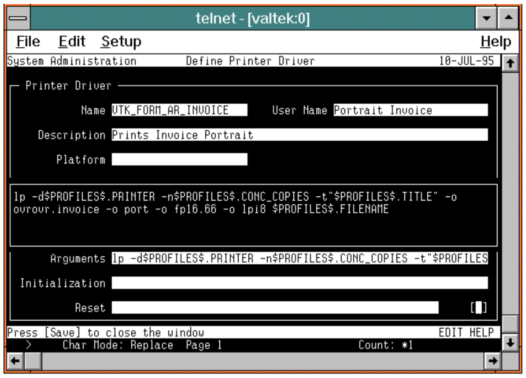
-o port -o fp16.66 -o lpi8

options portrait, font pitch of 16.66, 8 lines per inch. The 1st option is the one we added: -o ovrovr.invoice. This means apply an overlay from the file ovr.invoice.



```
System Administration        Define Printer Driver                 10-JUL-95
 Printer Driver
         Name UTK_FORM_AR_INVOICE      User Name Portrait Invoice
  Description Prints Invoice Portrait
     Platform
   SRW Driver HPL
Driver Method Command
   Spool File No  Standard Input Yes Program Name
    Arguments lp -d$PROFILES$.PRINTER -n$PROFILES$.CONC_COPIES -t"$PROFILES
Initialization
        Reset                                                      [ ]
                                                               EDIT HELP
        Char Mode: Replace  Page 1                    Count: *1
```

Figure O7 Path: \ **N**avigate **I**nstall **P**rinter **D**river **D**efine



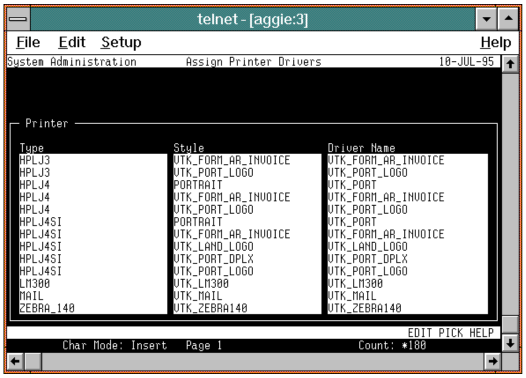
```
System Administration        Define Printer Driver                 10-JUL-95
 Printer Driver
         Name UTK_FORM_AR_INVOICE      User Name Portrait Invoice
  Description Prints Invoice Portrait
     Platform

lp -d$PROFILES$.PRINTER -n$PROFILES$.CONC_COPIES -t"$PROFILES$.TITLE" -o
ovrovr.invoice -o port -o fp16.66 -o lpi8 $PROFILES$.FILENAME

    Arguments lp -d$PROFILES$.PRINTER -n$PROFILES$.CONC_COPIES -t"$PROFILES
Initialization
        Reset                                                      [ ]
Press [Save] to close the window                               EDIT HELP
   >    Char Mode: Replace  Page 1                    Count: *1
```

Figure O8 Path: \ **N**avigate **I**nstall **P**rinter **D**river **D**efine \ **F**ield **E**dit

Clear the Initialization and Reset fields. These strings are placed around the report, but after any settings performed by the ‘lp’ command options. If you are careful, you should be able to use both fields with lp options. Just be aware that these init/reset strings can affect the options you specify to the ‘lp’ command.

### Step 5: Assign Drivers

This is where we link a printer driver with a style and a type. Figure O9 shows some examples that we have.



```
System Administration        Assign Printer Drivers                10-JUL-95

 Printer
  Type                 Style                  Driver Name
  HPLJ3                UTK_FORM_AR_INVOICE    UTK_FORM_AR_INVOICE
  HPLJ3                UTK_PORT_LOGO          UTK_PORT_LOGO
  HPLJ4                PORTRAIT               UTK_PORT
  HPLJ4                UTK_FORM_AR_INVOICE    UTK_FORM_AR_INVOICE
  HPLJ4                UTK_PORT_LOGO          UTK_PORT_LOGO
  HPLJ4SI              PORTRAIT               UTK_PORT
  HPLJ4SI              UTK_FORM_AR_INVOICE    UTK_FORM_AR_INVOICE
  HPLJ4SI              UTK_LAND_LOGO          UTK_LAND_LOGO
  HPLJ4SI              UTK_PORT_DPLX          UTK_PORT_DPLX
  HPLJ4SI              UTK_PORT_LOGO          UTK_PORT_LOGO
  LM300                UTK_LM300              UTK_LM300
  MAIL                 UTK_MAIL               UTK_MAIL
  ZEBRA_140            UTK_ZEBRA140           UTK_ZEBRA140
                                                           EDIT PICK HELP
        Char Mode: Insert   Page 1                    Count: *180
```

Figure O9 Path: \ **N**avigate **I**nstall **P**rinter **D**river **A**ssign

### Step 6: Concurrent Manager

Finally, after printer definitions are changed, all the concurrent managers need to be restarted. This is because printer definitions are cached and changes may not work until this is done. In fact, our experience has been that modified styles and drivers can stop working all together.

Figure O10 displays table relationships for printers. Printers are grouped by types. Printer types are used to group functionally equivalent printers. Printer styles specify page size and orientation. Printer drivers describe the actual method for printing to a printer. Finally, printer drivers are assigned to a style and a type.

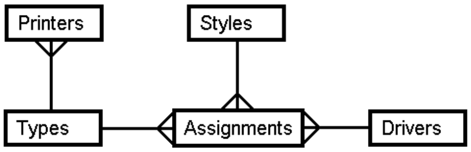


Figure O10

## Part 2: Unix Connection

The 'lp' command is used to submit files to the print spooler along with printing options[3]. When the spooler is ready to print the files, it invokes a printer model shell script to apply the specified options and to do the actual printing. On our system, the scripts are found in this directory:

/etc/lp/interfaces

The scripts are named after their respective printer, so that each printer has its own script. This script in turn calls another script found in:

/etc/lp/interfaces/model.orig

These are named after their printer also. This second script is the one that interprets the options and sends the files to the printer.

First, we created a directory for the overlay files:

```
  /etc/lp/pcl
```

Note that the user root or lp should be used to create this directory. Second, the script needs to be modified. Because it is a long script, I will only list the enhancements here.

At the beginning of the script, we define a variable to contain the path where the overlays are located.

```
  reverse=""
  #reverse="yes"
  PATH="/bin:/usr/bin:/usr/lib"
  export PATH
  PCLPATH="/etc/lp/pcl"                      #valtek
```

Further down is found an initialization block. Here an overlay variable is added, defined as "default".

```
  # Initialize option vars to default values
  overlay="def"                     #valtek
  length="def"
  pitch="def"
```

Next, there is a ‘for loop’ structure that parses all options. The overlay option is added at the beginning of this loop. The lines commented with "debug" check the first character of the file for a slash, ‘/’. If it is, the script assumes that the full pathname is provided, allowing you to override the overlay directory that is provided. If the overlay option is specified by ‘-o ovrfilename’, then the file name following ‘ovr’ is used as the overlay file.

```
  for i in $5; do
    case “$i" in
    -ovr* | ovr* )                           #valtek
    overlay="`echo "$i" | sed 's/^[-]*ovr//'`"
                                    #valtek
    pclpath="`echo "$overlay" | cut -c1`"
                                    #valtek debug
    if [ "$pclpath != "/" ]; then   #valtek debug
      overlay="$PCLPATH/$overlay" #valtek
    fi                              #valtek debug
    ;;                              #valtek
```

Finally, there is another for loop, inside a while loop. The while loop controls the number of copies, and the inner for loop processes options and prints the files. Again, the modification is added to the beginning of the for loop.

```
  while [ $i -le $copies ]
  do
    for file in $files
    do
      case "$overlay" in            #valtek
      def ) ;;                          #valtek
      * )                               #valtek
        if [ -r "$overlay" ]; then      #valtek
          echo "\033&f0y0X\c"           #valtek SOM
#SOM start of macro
          cat "$overlay"                #valtek
          echo "\033&f1X\033&f0y4X\c" #EOM
#EOM end of macro/ flag as overlay
        fi                              #valtek
        ;;                              #valtek
      esac                              #valtek
```

If the overlay is readable, the start-macro PCL command, the overlay file, and then the end-macro and flag-as-overlay PCL commands are sent to the printer.

All of our LaserJets use the same script file by creating a soft-link file ( unix command ‘ln -s actual-file link-file’, i.e.: ln -s vtk.lj act1 ) for each of the printers. Then only one script needs to be modified when corrections or features are made.

## Part 3: Graphical Overlays

The method below uses Paintbrush in Microsoft Windows, as well as a shareware hex editor and ftp software. There are 4 steps to creating the overlay.

1. Print to file
   Add to windows a printer that will output to a disk file.

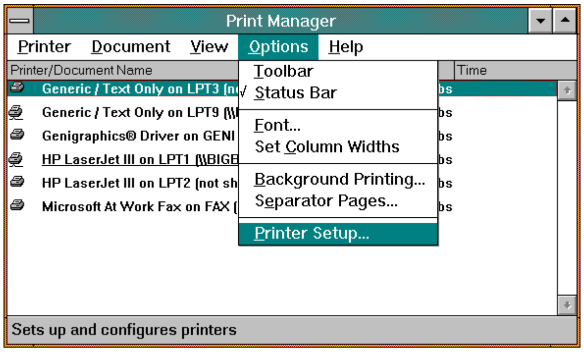
2. Design overlay
   Using Paintbrush or another graphic design software, create an overlay and print it to a file.

3. Edit Overlay
   Using a hex/binary editor, remove undesired PCL commands from the overlay file.

4. Transfer
   Transfer the overlay file to your host system.

**Step 1: Print to file**
This step describes adding a printer to windows whose output device is a file. In the WIN.INI file there is a section titled [ports]. This lists all ports that a printer can connect to. In the list there should be an entry of ‘FILE:=‘. If it is not there, you can add it using NOTEPAD or SYSEDIT.

Run Print Manager found in the Main folder in Program Manager. Select Options, Printer Setup (figure W1).



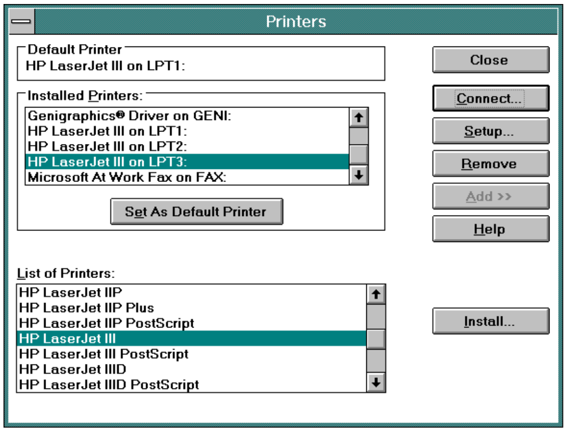
Printer/Document Name | Time

Generic / Text Only on LPT3 (n
Generic / Text Only on LPT9 (\\
Genigraphics® Driver on GENI
HP LaserJet III on LPT1 (\\BIGE
HP LaserJet III on LPT2 (not sh
Microsoft At Work Fax on FAX (

Sets up and configures printers

Figure W1

This opens the Printers window (figure W2). Now select Add, choose an HP LaserJet II, or III printer, and Install.



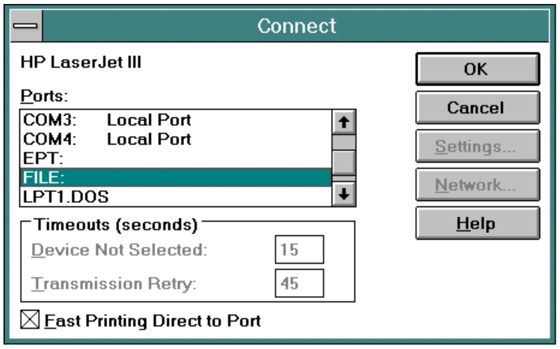
Default Printer
HP LaserJet III on LPT1:

Installed Printers:
Genigraphics® Driver on GENI:
HP LaserJet III on LPT1:
HP LaserJet III on LPT2:
HP LaserJet III on LPT3:
Microsoft At Work Fax on FAX:

List of Printers:
HP LaserJet IIP
HP LaserJet IIP Plus
HP LaserJet IIP PostScript
HP LaserJet III
HP LaserJet III PostScript
HP LaserJet IIID
HP LaserJet IIID PostScript

Figure W2

Select Connect, and pick the port 'FILE:' (figure W3). Then select OK, Close, and exit Print Manager.



HP LaserJet III

Ports:
COM3: Local Port
COM4: Local Port
EPT:
FILE:
LPT1.DOS

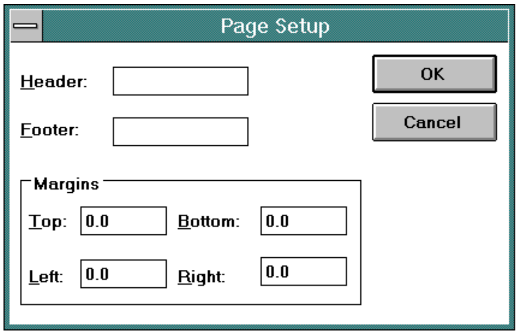
Timeouts (seconds)
Device Not Selected: 15
Transmission Retry: 45

☒ Fast Printing Direct to Port

Figure W3

**Step 2: Design Overlay**

Run Paintbrush found in the Accessories folder in Program Manager. In order to create a full page overlay, some settings need to be changed. Overlays can be any size, however I will show the settings I use for a full page. Select File, then Page Setup, set all margins to 0, then select OK (figure W4).

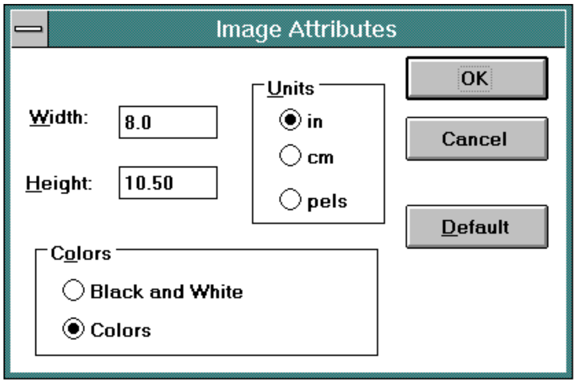


Header:
Footer:

Margins
Top: 0.0 Bottom: 0.0
Left: 0.0 Right: 0.0

Figure W4

Next, change the image size to a full page. Select Options, and Image Attributes (figure W5). Change Width to 8.0 and Height to 10.5 inches. Select either Colors or Black and White. The difference between the two are in the shading options available, by colors or patterns. Then select OK.



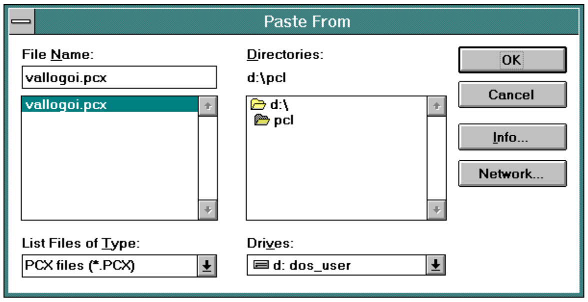
Width: 8.0
Height: 10.50

Units
● in
○ cm
○ pels

Colors
○ Black and White
● Colors

Figure W5

This next part is where you are on your own. Design and/or import your overlay. Here, I will import our company logo by selecting Edit, Paste From, and select an image file (figure W6 and W7).



File Name: vallogoi.pcx
vallogoi.pcx

Directories: d:\pcl
d:\
pcl

List Files of Type: PCX files (*.PCX)

Drives: d: dos_user

Figure W6

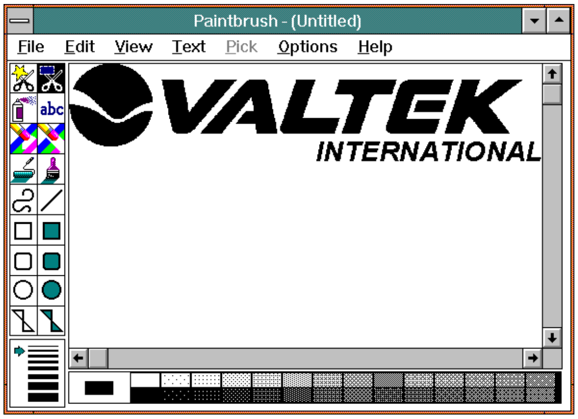
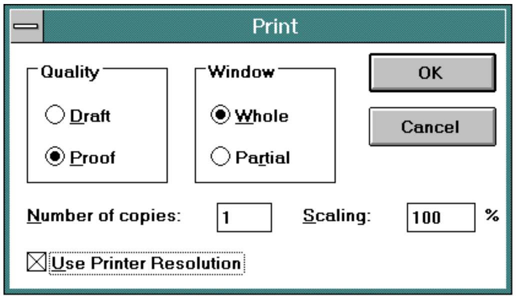


Figure W7

When your design is ready, print it to a printer to verify the way it looks. First, verify your print setup by selecting **F**ile, **P**rint Setup. Then select **F**ile, **P**rint, then proof and whole copy (figure W8). The scaling and Use printer resolution options allow you to tinker with the size of the printout.



Quality
○ Draft
● Proof

Window
● Whole
○ Partial

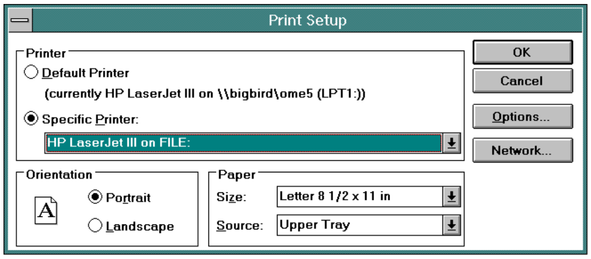
Number of copies: 1

Scaling: 100 %

☒ Use Printer Resolution

Figure W8

When your overlay is ready, select **F**ile, **P**rint Setup (figure W9). Select **S**pecific Printer, then your LaserJet-to-FILE printer, then **O**K. The Print to file window will appear prompting for a file name (figure W10). I have entered the name 'test.pcl'.

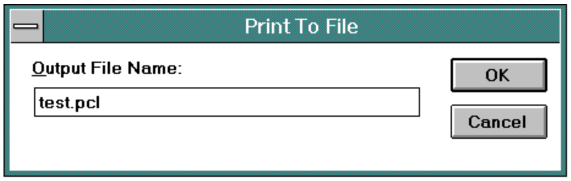


Printer
○ Default Printer
(currently HP LaserJet III on \\bigbird\ome5 (LPT1:))
● Specific Printer:
HP LaserJet III on FILE:

Orientation
● Portrait
○ Landscape

Paper
Size: Letter 8 1/2 x 11 in
Source: Upper Tray

Figure W9



Output File Name: test.pcl

Figure W10

**Step 3: Edit Overlay**

When a graphic program prints an image, besides the image itself, other PCL codes are sent which setup the printing environment. These need to be removed so that your overlay will not alter the print environment of your Oracle printer driver. This can be accomplished by using a binary or hex editor. I happen to like HXED for DOS[4]. But there are others like HEXED[5] and HXP201[6], both Windows programs, that I found along with HXED on CompuServe.

Here is a list of PCL codes that can usually be found in a graphic print PCL file. These may appear in any order, but are usually found at the beginning of the file (figure W11). The symbol $1B is a hexadecimal number for the escape character. Any '#' symbol represents a number specified as ASCII digits like '1'.

Remove these codes found at the beginning

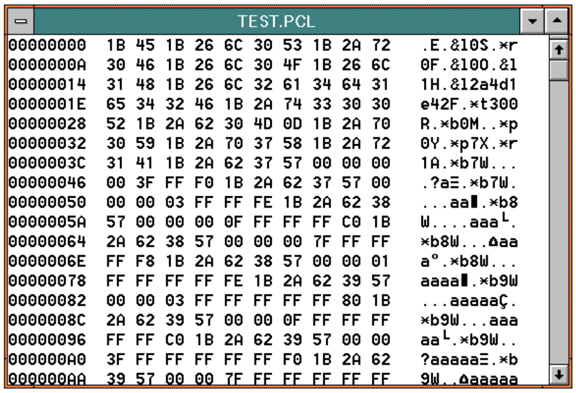
| | |
|---|---|
| $1B 'E' | reset |
| $1B '&l#S' | '0' simplex '1' duplex |
| $1B '&l#O' | '0' portrait '1' landscape |
| $1B '&l#H' | paper source |
| $1B '&l#X' | number of copies |
| $1B '&l#A' | paper size |
| $1B '&l#F' | Text length |

Edit these code

| | |
|---|---|
| $1B '&l#D | lines per inch, set to '6' |
| $1B '&l#E | set top margin, set to '1' |

Remove these codes found at the end

| | |
|---|---|
| $1B 'E' | reset |
| $0C | formfeed |
| $0D | return |



```
00000000  1B 45 1B 26 6C 30 53 1B 2A 72   .E.&l0S.*r
0000000A  30 46 1B 26 6C 30 4F 1B 26 6C   0F.&l0O.&l
00000014  31 48 1B 26 6C 32 61 34 64 31   1H.&l2a4d1
0000001E  65 34 32 46 1B 2A 74 33 30 30   e42F.*t300
00000028  52 1B 2A 62 30 4D 0D 1B 2A 70   R.*b0M..*p
00000032  30 59 1B 2A 70 37 58 1B 2A 72   0Y.*p7X.*r
0000003C  31 41 1B 2A 62 37 57 00 00 00   1A.*b7W...
00000046  00 3F FF F0 1B 2A 62 37 57 00   .?aΞ.*b7W.
00000050  00 00 03 FF FF FE 1B 2A 62 38   ...aa▮.*b8
0000005A  57 00 00 00 0F FF FF FF C0 1B   W....aaa└.
00000064  2A 62 38 57 00 00 00 7F FF FF   *b8W...Δaa
0000006E  FF F8 1B 2A 62 38 57 00 00 01   a°.*b8W...
00000078  FF FF FF FF FE 1B 2A 62 39 57   aaaa▮.*b9W
00000082  00 00 03 FF FF FF FF FF 80 1B   ...aaaaaÇ.
0000008C  2A 62 39 57 00 00 0F FF FF FF   *b9W...aaa
00000096  FF FF C0 1B 2A 62 39 57 00 00   aa└.*b9W..
000000A0  3F FF FF FF FF FF F0 1B 2A 62   ?aaaaaΞ.*b
000000AA  39 57 00 00 7F FF FF FF FF FF   9W..Δaaaaa
```

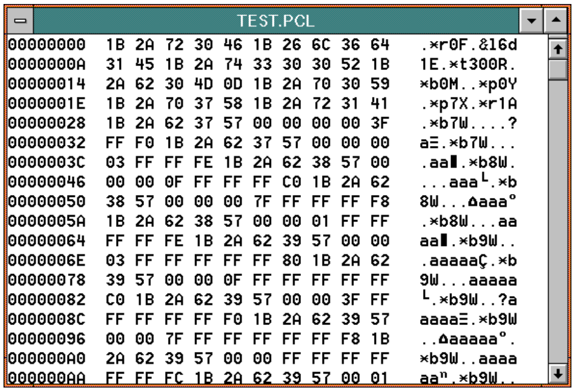
Figure W11

Graphics printed on a LaserJet are not affected by the text formatting commands like lines-per-inch and top-margin. However, these two text commands determine the initial graphical origin point (0,0). Lines-per-inch of 6 work out to 50 dots per line. Lines are numbered from zero. These text commands place the origin point at the first printable dot on the paper.

PCL codes can be combined when the lead-in command is the same. For example, in this file this sequence is found:

```
   $1B '&l2a4d1e42F'
```

With combined codes, function letters are in lowercase except for the last one, which indicates end-of-command. I edited out the '2a' and the '42F', leaving the 'd' and 'e' functions. Then I changed the numbers and upshifted the 'E' (figure W12).



```
00000000  1B 2A 72 30 46 1B 26 6C 36 64   .*r0F.&l6d
0000000A  31 45 1B 2A 74 33 30 30 52 1B   1E.*t300R.
00000014  2A 62 30 4D 0D 1B 2A 70 30 59   *b0M..*p0Y
0000001E  1B 2A 70 37 58 1B 2A 72 31 41   .*p7X.*r1A
00000028  1B 2A 62 37 57 00 00 00 00 3F   .*b7W....?
00000032  FF F0 1B 2A 62 37 57 00 00 00   aΞ.*b7W...
0000003C  03 FF FF FE 1B 2A 62 38 57 00   .aa▮.*b8W.
00000046  00 00 0F FF FF FF C0 1B 2A 62   ...aaa└.*b
00000050  38 57 00 00 00 7F FF FF FF F8   8W...Δaaa°
0000005A  1B 2A 62 38 57 00 00 01 FF FF   .*b8W...aa
00000064  FF FF FE 1B 2A 62 39 57 00 00   aa▮.*b9W..
0000006E  03 FF FF FF FF FF 80 1B 2A 62   .aaaaaÇ.*b
00000078  39 57 00 00 0F FF FF FF FF FF   9W...aaaaa
00000082  C0 1B 2A 62 39 57 00 00 3F FF   └.*b9W..?a
0000008C  FF FF FF FF F0 1B 2A 62 39 57   aaaaΞ.*b9W
00000096  00 00 7F FF FF FF FF FF F8 1B   ..Δaaaaa°.
000000A0  2A 62 39 57 00 00 FF FF FF FF   *b9W..aaaa
000000AA  FF FF FC 1B 2A 62 39 57 00 01   aaⁿ.*b9W..
```

Figure W12

**Step 4: Transfer**

Using FTP or other available methods, transfer the file to your host system and place it into the /etc/lp/pcl directory.

## Review

These 3 parts can be done in any order. Create your overlay and move it to your host system, change the unix print model script, and create a new print style, driver, and assignment in Oracle. Now you are ready to test. From unix, issue an 'lp' command with the option -o ovrtest.pcl and some small file. After this test is successful, print a report from Oracle using your new print style.

## Wrap-up

Valtek has expanded this method to print downloaded fonts, namely barcode39. In the near future we are planning to print signatures on certain documents. Another feature can be a company watermark on the paper instead of or along with a logo.

Security can be an issue here for certain forms. This method relies on both Oracle's ability to control access to printer styles and unix's control of readers of files. Another method for storing the overlay and fonts can be in a long raw field that could be selected at the header of a report. This approach does require a change to the report.

While completing this paper I am still learning about the many printer setup options and how they work. In theory, you could skip the print model script changes by placing the start-macro and end-macro commands into your overlay file (surrounding your image data). Then include the overlay file name with its fullpath before the report filename in the printer driver arguments, i.e.:

```
   lp -d$PROFILES$.PRINTER -
   n$PROFILES$.CONC_COPIES
   /etc/lp/pcl/test.pcl $PROFILES$.FILENAME
```

As yet, I haven't had success with this method.

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## About the Author

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I have been at Valtek for 15 years programming in FORTRAN 66, C, and SPL on an HP3000. Also, assembly, C, and basic on the PC with other small experience with Pascal, Lisp, COBOL, and DBASE. While maintaining and expanding the MANMAN software, my projects have been in Manufacturing, Purchasing, Order Entry, Receivables, and Payroll.

For the past year, I have been on the Receivables to Oracle and Order Entry implementaion teams. I have also worked on some system administration items, like printers.

[1] PCL 5 Printer Language Technical Reference Manual, chapter 12, Hewlett Packard
[2] Oracle Applications System Administration Reference Manual Release 10, chapter 9, Oracle
[3] The printer software we use is Jetadmin from HP and Printastic from AT&T
[4] HXED.ZIP,Hex edit for Dos, by Anthony F. Stuart, found on CompuServe
[5] HEXED.ZIP, ARIS HexEdit for Windows, found on CompuServe
[6] HXP201.ZIP, HEXpert for Windows, by Matthew Woolsey, found on CompuServe