Printed by the HP2680A Laser Printing System

THE

HP2680A

LASER PRINTING

SYSTEM

(SOFTWARE)

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THE HP 2680A LASER PRINTING SYSTEM

The HP2680A Laser Printing System consists of a medium-speed laser printer which together with its associated software, allows the development and printing of forms containing data, special character sets, company logos as well as the usual design elements making up a standard form.

The outstanding feature of this printing system is the interactive software which is used for development of all kinds of different forms, character sets, company logos and other artwork using no more than a standard graphics terminal and a digitiser linked up with an HP 3000 computer. This software has been specially designed for the use of the non-programmer – all instructions are entered through menus or special function keys on the terminal and there are various useful default values present in the menus. In addition, sensible warning and error messages are displayed to prevent the user from wasting his time with correcting mistakes.

Although the software is very easy to use, it has many built-in features allowing the user to make full use of the printing flexibility of the HP 2680A Laser Printer. It is the purpose of this presentation to describe some of these features using practical examples.

OVERVIEW

The structure of the software associated with the HP2680A Laser Printer could be represented in the form of the following equations:-

Printout = Data File + Environment File

Environment File = Forms + Character Sets + Page Layout

Forms = Lines + Boxes + Shading + Headings + Logos + Signatures

Character Sets = Characters + Logos + Signatures + Other Artwork

The following software is available for use with the HP2680A Laser Printer:-

1 - IFS2680 (Interactive Formatting System) is used for creating environment files.
2 - ID /3000 (Interactive Design Software) which includes two programmes:
    a) IDSFORM for creating forms
    b) IDSCHAR which is used for creating character set and logo files.
3 - Various intrinsics within MPE which are used to conrol the Laser Printer.

PRINTING

In order to control the printing out of data by means of the environ-
ment file, a modified version of the file equation can be used
which allows the environment file to be specified. This file
equation also specifies the target device ie. the HP2680A printer.

eg. :FILE PRINTOUT;DEV=EPOC;ENV=TESTENV;CCTL

   ("EPOC" is the device class name for the HP2680A)

Data which is sent to this device file "PRINTOUT" will be automatically
merged with the environment file "TESTENV". It is sent in this form to
the spooler and then printed out using the specified character sets,
forms etc.

INTERACTIVE DESIGN CONTROL

Since IDS/3000 has been designed with the non-programmer in mind,
no special programming language has to be learnt in order to make
full use of the features of this system.

All instructions to the system are entered by the user by means of
menus and function keys. In order to save on development time,
useful default values are provided by the software. These are par-
ticularly valuable when only relatively simple environments, forms
and characters are to be designed. Warning and error messages pre-
vent even an inexperienced user from making serious errors such as
erasing the product of an afternoon's work!

When the user has completed and entered some menus, the system
asks him to confirm his entries by repeating "enter". Some
additional information may be displayed so that the user can be
quite sure that his entries are correct.

IFS2680 - ENVIRONMENT DESIGN

The environment file contains all the information required to con-
trol the printing of data:-

1 - Physical page information:
      Paper dimensions
      Number of copies of each page to be printed

2 - Print formatting information:
      Location and dimensions of printing areas on a physical page.
         These printing areas are called logical pages.
      Names of forms on which data is to be printed. Each form
         must be attached to a logical page.

The positioning of a form on a logical page may be
done manually by indicating the distances from the
top and left hand sides of the logical page or it
may be placed automatically either in the centre of
the page or in one of the four corners. If the form
does not fit into the logical page, it may be scaled
down automatically. However, if desired, the form
may project beyond the sides of the logical page. In
this case, no data may be written to the parts of
the form lying outside the logical page boundary.

      Vertical formatting control for each logical page
      Printing direction (orientation) on a logical page

Up to thirty-two different logical pages containing
two forms each may be specified. However, there is
a limit of 18 different forms which can be printed
on a physical page.

3 - Typeface information for printing data:
      Character font name
      Character font size
      Character font orientation

Up to thirty-two character sets may be specified
within an environment file. Each orientation and
size of a character font is declared as a different
character set. Logos, signatures and other artwork
can be specified to be character sets and may thus
be printed out as data.

INITIALISATION

If the user wishes to make use of most or all of the features of
a standard environment file present in the system or of one of his
own environment files, this may be specified on the Initialisation
Menu. The desired features are then copied from one environment
file to the one that the user is constructing.

Among the standard environment files in the
system, there are several which may be used
for automatic 2:1 or 4:1 reduction of data.
This is especially useful for storing large
amounts of computer output in archives.

MULTI-COPY FORMS

There is a special menu for specifying multi-copy forms which are
intended to simulate the use of carbon paper with each copy consisting
of a different form for distribution to different people. With this
menu, one can indicate two forms to be printed on each copy. Up to eight
different copies may be specified - each containing two different
forms while the data printed on each form will be the same. It is of
course possible to blank out data on certain forms by specifying
black boxes within the forms.

COMPILATION

When all desired parameters have been entered into the environment
file, they must be compiled so that they can be downloaded to the
HP2680A in a form that can be used directly for printing. The com-
pilation of the environment file is started by a command in the
main menu.

IDSFORM - FORMS DESIGN

Forms which are used for printing data on the Laser Printer are
stored in standard MPE forms files. Each forms file may contain
different named forms.

The IDSFORM programme is used for interactive forms design using only
an HP graphics terminal. For ease of development and modification,
each form may be have a structure consisting of:

1 - Subforms
> Sub-forms may be stored in a temporary "Hold" file and may be
> moved or copied to other locations on the same form or even
> to other forms.

2 - Fields which are used for printing data and for specifying
headings. Fields must be contained within sub-forms.
> Headings may be specified using any desired character sets
> in any one of the four possible orientations and in various
> sizes. In addition, the position of a heading within the
> field may be specified as well as whether it is to be
> justified or not. Any logo or special characters stored
> by the user may be specified in a heading.

3 - Subfields which may be used for printing data. They must be
contained within fields.

FORM GRAPHICS

When working at the form and sub-form levels, it is possible to make
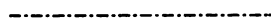use of some graphics features:
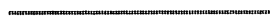1 - Line drawing using 3 different line thicknesses and 8 types.
2 - Box drawing using 3 different outline thicknesses and 8 types.
3 - Box shading in 5 different shades
Some examples of the variations possible in drawing lines and boxes
are shown opposite.
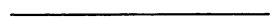
DESIGN AIDS

A grid with numbered lines can be specified by the user in order to
be able to place form elements at precisely the location he requires.
This grid is purely a design aid and is not printed on the final
version of the form.

IDSFORM - GRAPHICS OPTIONS

─────────────── Solid single line	\
·················· Dotted line	I
─ ─ ─ ─ ─ ─ ─ Dashed line	I
─·─·─·─·─·─·─ Dot-dash line	I All combinations of these line types
─────────────── Thin solid line	> and thicknesses are possible. They
·················· Normal thickness dotted line	I may be specified on the graphics menu.
━ ━ ━ ━ ━ ━ Wide dashed line	I
⁞⁞⁞⁞⁞⁞⁞⁞⁞⁞⁞⁞⁞⁞⁞ Double dotted line	I
■ ■ ■ ■ ■ ■ ■ Double wide dashed line	/
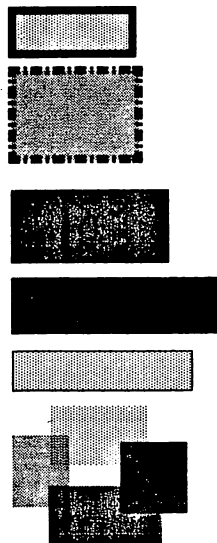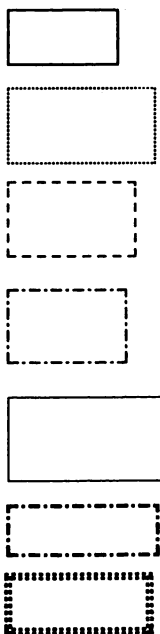
These are some of the box-drawing possibilities. Box shading as well as the outline type and thickness may be specified in any combination

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IDSCHAR - CHARACTER SET DESIGN

Characters, logos and other artwork used for printing on the Laser
Printer are stored in standard MPE files. Two file types may be
specified:

1 – Character Set Files: each of these files is used for a com-
    plete typeface ie. all sizes and orientations of each charac-
    ter are stored in a character set file.

2 – Logo Files: each of these is used to store a particular logo
    or piece of artwork in all of the desired sizes.

IDSCHAR is the programme used for the interactive creation of charac-
ter sets and design elements by means of an HP graphics terminal and
an HP digitiser or graphics tablet. The basic storage unit of a
character set or logo is the character cell.

CHARACTER CELL SPECIFICATIONS

1 – Cell dimensions (maximum size is 255 x 255 printing dots
                     ie. 3.6 cm or 1.4 inches square)
2 – If proportional spacing is to be used for printing
3 – The bounds used for proportional spacing
4 – Positioning of the cell relative to other cells when printing.

PROPORTIONAL SPACING

Character sets may be defined as being proportionally spaced ie. the
printing position of a character on a line depends on the width of the
previous character. For instance, in the final printout, the space
takern up by an "i" will be much less than that taken up by a "w".
Within a character cell, the bounds used for proportional spacing
may be specified.

DESIGN AIDS

Outline Generation:
In order to simplify the task of designing characters, logos, sig-
natures etc, an HP digitiser or graphics tablet may be used to trace
the outline of a piece of artwork. Within IDSCHAR, this outline may
be stored, magnified or moved within a character cell. If
the user is satisfied with the outline, he may fill it in manually or
automatically with printable dots.

Cell Grid:
For the accurate placement of printing dots within a cell, the dot
positions can be marked automatically using a two letter command.

Cell Manipulation:
When designing for instance a character set, a very useful feature
of the system is the possibility to move character cells around the
screen and to display different character cells at the same time.

Cell Graphics:
Using the function keys on the terminal,
it is possible to draw lines, arcs, circles
and boxes within a character cell as shown
here on the right.
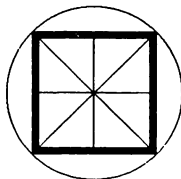
Examples of Character Design:

PROGRAMMATIC CONTROL

Under MPE, various intrinsics have been implemented to allow the
user complete flexibility in controlling data printout. A programme
called Translator (available in the Contributed Library) simplifies
the use of these intrinsics to allow even the non-programmer access to
the features of the Laser Printing System.

PHYSICAL PAGE CONTROL

A skip to a new physical page may be carried out at any time during
the printing of the data using an intrinsic.

LOGICAL PAGE CONTROL

Up to thirty-two logical pages may be specified per physical page; a
logical page may be either active or inactive. The data coming from
a source file or programme is printed on each active logical page in
sequence. When all active logical pages have been printed on, print-
ing continues on the first active logical page of the next physical
page. Logical pages may be activated or deactivated using an intrinsic.

CHARACTER SET SELECTION

Character set selection with an intrinsic is done by specifying the
primary and secondary character sets. As with an ordinary printer,
data is normally printed with the specified primary character set but
after a shift out, the secondary character set is used for printing.

DATA DIRECTING

Data can be directed to print out on a particular named field of a
specified sub-form within a selected form. The exact destination
of the data may be specified using three intrinsics. One advantage
of this system over traditional printing methods is that changes
can be made to the form without making any changes to the appli-
caions programme producing the data – the named forms, sub-forms
and fields are all the parameters that are required.

PEN CONTROL

The laser in the HP2680A can be considered to be a pen drawing an
image on the paper. This pen can be moved about and positioned any-
where on the paper using intrinsics. Printing of data always starts
at the current pen position.

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OBTAINING PRINTING INFORMATION

Several intrinsics can be used to obtain information on the following:

1 - The character fonts in use
2 - The logical pages in use
3 - The current state of the print job
4 - The width of a given character string in dots
5 - Error information.

GLOSSARY

Cell File: An MPE file containing character cells ie. charac-
ters, company logos, signatures and other graphics
elements.

Character Cell: Storage unit within a cell file which contains a
character, logo or signature etc of a particular
font, size and orientation.

Dots: Since the HP2680A printer prints dot patterns, cell
size for instance may be specified in terms of dots
(180 dots per inch or 71 dots per centimetre).

Environment File: An MPE file containing all the information re-
quired for the printing out of formatted data
together with any desired forms.

Forms File: This is an MPE file containing one or more forms.

Logical Page: This is a printing area defined on a physical
page which is used for printing data and forms.

Multi-copy Forms: This is a feature simulating the use of carbon
paper in sending the same data on different forms
to different recepients.

Point Size: This is the term used in the printing industry in-
dicating type size. As a general rule, there are
70 points per inch but the exact point size of a
character also depends on some other factors apart
from the height of the letter.

Proportional Spacing: Variable spacing between letters depending on
the actual width of each individual letter.

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CONCLUSION

For the user who wishes only to print out a report or a memo on the Laser
Printer the task is made easy by the use of default values available
within the system while the user who wishes to make use of all the fea-
tures of the Laser Printer is enabled to do so by the great flexibility
of the software.

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