Dgener8

User Guide and Manual
Version 1.0

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Section 1

Introduction to Dgener8

1.1 What is Dgener8?

Dgener8 is a map producing computer package designed to run on a UNIX platform. It has been developed primarily for producing maps from the spatial datasets held at IH, but it is also capable of displaying data from users' own files.

Dgener8 was designed and written specifically to meet the requirements of IH applications. This gives it an advantage over alternatives (such as Arc/Info) in that it defaults to settings which are appropriate to most IH users. This means that after less than 30 minutes tuition, most users will be able to produce a wide range of hydrological maps. The only prerequisites are a userid on the IH UNIX network and the ability to edit a file.

The maps may be displayed on any screen (workstation console, X-terminal or PC running as an X-terminal) or written to a PostScript file.

NOTE: Dgener8 is not, and does not try to be a Geographical Information System (GIS).

1.2 Who is responsible for Dgener8.

Dgener8 was concieved as a spatail data validation tool for the National River Flow Archive. It has since been developed as the single replacement for many spatial data plotting facilitites that were available on the now defunct IBM mainframe.
All queries and comments on Dgener8 should be directed to Robert Flavin.

1.3 How is Dgener8 controlled?

Dgener8 is controlled from a file of commands. Within a control file it is possible to include further files of Dgener8 commands. This helps to reduce duplication. Each command has one or more parameters and, where possible, defaults for these are set to sensible values. These defaults operate in a hierarchial way at four levels - system, user, project and job. The system level, which cannot be altered by the user, contains ALL the initial settings. At the user level, the user has his/her own settings that apply to all jobs run under that user id. The project level sets defaults for all jobs run under the current directory and the job level sets defaults solely for the individual job. The methods for setting defaults are covered later in this manual.

1.4 How easy is it to use Dgener8?

The following example shows how easy it is to use Dgener8.

The map which forms Figure 1 has been produced by a control file containing only 4 lines, namely:

```
DEVI POST
AREA CAT 48005
CATS GAUG 48005
DRAI IHCH
```

Listing 1 A simple Dgener8 control file

- The first line tells it to produce a PostScript file (defaulting to A4)
- The second defines the area of the map to be just larger than the bounding rectangle of catchment 48005
- The third tells it to plot the boundary of catchment 48005
- The fourth tells it to plot the 1:50000 river network (IH Channels)

Note that if the required scale is not specified, Dgener8 selects one that is suitable for the device.

1.5 What data can be plotted by Dgener8?

Almost all of the UK spatial datasets managed by the National Water Archive section may be incorporated in Dgener8 maps. Currently these include 1:50000 rivers, 50m hydrological digital terrain model (IHDTM) (5 grids), 1:50000 coastline, lakeshores and contours, catchment and hydrometric area boundaries, IHDTM-derived catchment boundaries, river flow gauging stations, raingauges, Flood Studies Report maps in vector or gridded format, monthly 1 km rainfall grids, HOST 1km grid, ITE urban coverage, ITE Lancover and various OS datasets. More datasets will be added, most notably 50m grids of GB solid and drift geology.

Appendix 1 lists all available datasets.

Users may also provide files of their own data. Many formats are supported including Arc/Info Ungenerated. Appendix II describes file formats that are compatible with Dgener8.

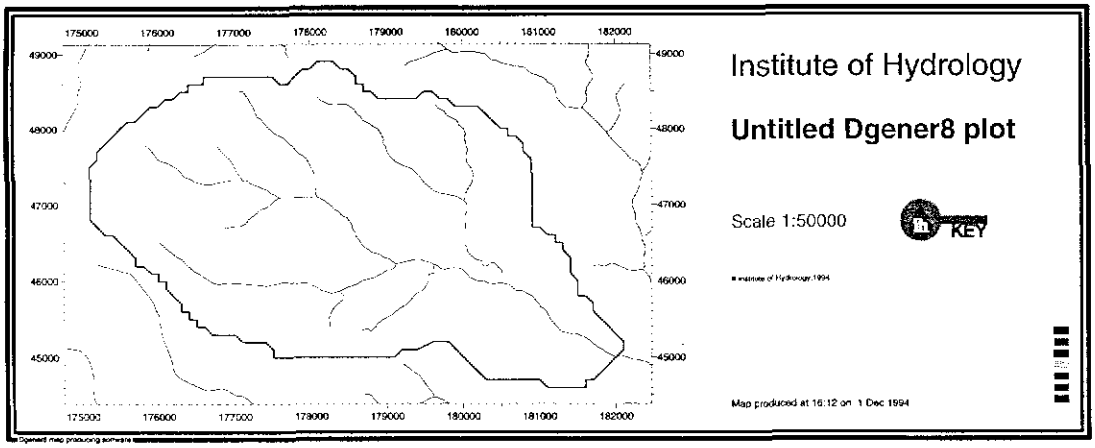


Figure 1 Map produced by the control file shown in Listing 1.

Section 2

Getting started

2.1 Getting on to the IH UNIX system

To access Dgener8 it is necessary to have access to a user id on the IH UNIX network. If you do not have one, see the NCS Help Desk.

2.2 UNIX text editors

There are a number of editors available on the IH UNIX network, the most common (universally available) is ***vi***. If you are inexperienced with editors, literature is available from the NCS Help Desk.

2.3 Setting up your user id for Dgener8

Before running Dgener8 a simple edit must be made to your ***.cshrc*** file.

The line

source ~nrfa/setup/nrfa_setup.cshrc

should be added anywhere after the line that indicates an interactive session. Once you have done this, type -

source .cshrc

This ensures that the change that you have just made becomes active straight away. From now on, from the moment you log on, you will be able to access Dgener8.

If you already use the nrfa subroutine libraries you may not need to change the ***.cshrc*** file.

2.4 Running Dgener8

To run Dgener8, the command is -

dg8 command_file

NOTE: Dgener8 utilises FORTRAN, UNIRAS and ORACLE so it is necessary to setup f77, oracle and uniras. If you are unsure as to how to do this, approach the NCS Help Desk.

Section 3

Tutorials for beginners

3.1 The Dgener8 tutorial files

A complete set of Dgener8 tutorial files exist in the directory -

~nrfa/Dgener8/tutorials

Make a directory called Dgener8 in your home directory i.e type -

mkdir ~/Dgener8

Change directory, so that you are in Dgener8 i.e type -

cd ~/Dgener8

Copy the tutorial files into this directory by typing -

dg8_tut

Look at the contents of the directory by typing -

ls

A number of files should now exist in this directory.

3.2 Tutorial 1a - rivers and catchment boundaries

Look at the contents of file ***dg8_tut_1a*** by typing -

more dg8_tut_1a

You will notice that the area that you are going to look at is defined by a gauging station number - this is one of many ways of telling Dgener8 the area that you wish to look at.

At first glance, the three Dgener8 commands that are used appear very simple, however, each command has many parameters (DRAI has 23, some of which allow complicated validation checks). In this tutorial, Dgener8 is using the defaults that exist for each command and data type. As the tutorials progress, you will be introduced to some of the more common parameters that you may wish to use.
Type -

dg8 dg8_tut_1a

A map should now appear on your screen showing rivers, coast and a catchment boundary. Look at the key that has appeared. You will notice that Dgener8 has selected a sensible scale and that the map is untitled. Dgener8 provides considerable control over what appears in the key and this is covered in Section 6.

The method of removing the map from the screen will depend on whether you are using a Silicon Graphics or a Sun workstation. On a Silicon Graphics, ensure that the cursor arrow is in the map area and then hit enter. On a Sun, ensure that the cursor arrow is in the map area and click with the left mouse button and then hit enter.

As a first introduction to command parameters we shall change the colour of the river lines from cyan to magenta.

Using the editor of your choice, edit the file ***dg8_tut_1a.***

The second line,

```
DRAI IHCH
```

should be edited to -

```
DRAI IHCH magenta
```

Save the file and, once again, type -

dg8 dg8_tut_1a

A map should now appear displaying rivers in magenta.

3.3 Tutorial 1b - elevation shading, urban areas, rivers and text

Look at the contents of file ***dg8_tut_1b*** by typing -

more dg8_tut_1b

You will notice that the area that you are now going to look at is defined by a coordinate system and National Grid coordinates.

The two commands following that are requesting Digital Terrain Model heights and Urban/Suburban Land Cover . You are familiar with the command that requests rivers and, the final command writes a label on the map. As in tutorial 1a, Dgener8 uses many of the default settings but, for the labelling command, the required label is given. You will notice that some of the parameters of the LABL command are given as asterisks - this once again means that Dgener8 uses the defaults settings.

Type -

dg8 dg8_tut_1b

A map should now appear on your screen showing height shading, urban/suburban coverage, rivers

and a label marking a well known establishment. The colours for the height shading to not show particularly well in this example. This is because the default shading is designed to cater for the whole country and, unfortunately, the Thames at Wallingford is rather flat. Later in this manual you will learn how to tailor the shading to your own requirements. Remove the map as before and then, using the editor of your choice, edit the file dg8_tut_1b.

The fifth line,

```
LABL black 2.0 850 black 3.0 3 0. 461250 189750 Institute
of Hydrology
```

should can edited to -

```
LABL cyan 3.0 * red 3.0 3 0. 461250 189750 Institute of
Hydrology
```

Save the file and, once again, type -

dg8 dg8_tut_1b

A map should now appear displaying a larger label (3.0mm) in cyan with the text in red. This is because the first and second parameters control the colour and size of the marker and the fourth parameter controls the colour of the text. You will notice an asterisk in the place of parameter three. This tells Dgener8 to use its own default.

3.4 Tutorial 1c - monthly rainfall and an IHDTM derived boundary

Look at the contents of file dg8_tut_1c by typing -

more dg8_tut_1c

You will notice that the area that you are now going to look at is defined by a country - in this case, Wales.

The command following this, RAST, requests monthly gridded rainfall for January, 1993. The CATS command requests a catchment boundary that is derived from the IHDTM.

Type -

dg8 dg8_tut_1c

A map should now appear on your screen showing monthly rainfall shading and a catchment boundary. Be patient. The catchment being derived is several hundred square kilometres and it will take a few seconds to be derived. Remove the map as before and then, using the editor of your choice, edit the file dg8_tut_1c.

The fourth line,

```
CATS DTMD 248600 220600
```

can be copied and then edited to read,

```
CATS DTMD 307400 244650
```

Save the file and, once again, type -

dg8 dg8_tut_1c

A map should now appear displaying two catchment boundaries draining to the respective points described in the CATS command.

3.5 Tutorial 1d - GB 1941-70 rainfall and raingauges

Look at the contents of file dg8_tut_1d by typing -

more dg8_tut_1d

You will notice that the area that you are now going to look at is defined by an Ordnance Survey Landranger map sheet number.

The command following that (RAST) requests SAAR 1941-70 rainfall data. The POIN command requests raingauges to be displayed.

Type -

dg8 dg8_tut_1d

A map should now appear on your screen showing SAAR data and raingauges. You will notice a large number of raingauges - too many. Do not worry about this. It is simply a drawback to conducting these tutorials on a small screen. In fututre, if you want to see the extent of raingauges you will use a large scale paper-based plot. Remove the map as before and then, using the editor of your choice, edit the file dg8_tut_1d.

The first line,

```
AREA LAND 183
```

can be edited to -

```
AREA LAND 26
```

Save the file and, once again, type -

dg8 dg8_tut_1d

A map should now appear displaying identical data but for a different Ordnance Survey Landranger map sheet.

3.6 Tutorial 1e - a users first control file

By looking at the tutorial files just completed, produce your own control file (call it dg8_tut_1e) that will give you a map of the area 430000 75000 465000 96000. Don't forget that you need to express the coordinate system as 0 (zero) for Great Britain as the first parameter of the command, AREA.
Ask for height shading and also the IH rivers. Finally, request an IHDTM derived catchment to the point 453450, 83900. If you become stuck, the necessary control file can be seen in Listing 2.

When you are happy with the control file, type -

dg8 dg8_tut_1e

You should now be looking at your first Dgener8 map (it should look like the Isle of Wight).

3.7 Tutotrial 1f - making hard copies

Remove the map as before and then, using the editor of your choice, edit the file dg8_tut_1e.

Add a line at the very start that reads -

```
DEVI POST
```

this tells Dgener8 that you require PostScript output.

Save the file and, once again, type -

dg8 dg8_tut_1e

For the first time, you will notice that nothing appears on the screen. Wait a few moments and the C-shell prompt should reappear. List what is in your directory by typing -

ls

You should see a file called dg8_tut_1e.POST. This file contains a PostScript version of your map. Send it to the black and white printer in room 137 by typing -

lpr -Phpjeta dg8_tut_1e.POST

You should now have your first Dgener8 hardcopy.

```
AREA 0 430000 75000 465000 96000
RAST HGHT
DRAI IHCH
CATS DTMD 453450 83900
```

Listing 2 The suggested answer to Tutorial 1e.

Section 4

Accessible datasets

4.1 Introduction

Dgener8 has been designed primarily to map the spatial data holdings of The Institute of Hydrology. It accesses the relevant database tables and it is not necessary for the user to know the whereabouts of individual datatypes. However, it can be advantageous for the user to know a little about the datasets e.g the vertical resolution of the IHDTM, in order to get the maximum from Dgener8's facilities.

Datasets to be used in Dgener8 are described by four-letter identifiers. A full list of data and their identifiers can be found in Appendix 1. In Section 4.2, below, the most commonly used data sets are listed with their four-letter identifiers in brackets.

Dgener8 will also map data that is held in files. A full description of the file formats that are supported e.g Arc/Info, NTF, etc. are contained in Appendix II.

4.2 A list of commonly used data types available in Dgener8.

4.2.1 Point data

- Ordnance Survey Spotheights (vertical resolution 1/10m) (OSSH)
- National River Flow Archive Gauging stations (GAUG)
- Raingauges (RNGA)

4.2.2 Line data

- Ordnance Survey Contours (vertival resolution 1/10m) (OSCO)
- Ordnance Survey Break Lines (OSBR)
- Ordnance Survey Ridge Lines (OSRL)
- Ordnance Survey Form Lines (OSFL)
- SAAR 1941-70 isolines (1/10mm) (4170)
- Potential Evaporation (POTE)
- Northern Ireland/Eire Border (NIBD)

4.2.3 Polygon data

- Ordnance Survey Highwater Mark (OSCS)
- Ordnance Survey Lake Shore (vert. resolution (1/10m) (OSLK)
- National River Flow Archive catchments (GAUG)
- IHDTM derived catchments (DTMD)

4.2.4 Network data

- IH digitised 1:50000 drainage channels (this includes rivers, canals, culverts etc.) (IHCH)
- IH digitised 1:50000 rivers (IHRV)
- IH digitised 1:50000 canals (IHCN)

4.2.5 Raster data

IHDTM heights (vertical resolution 1/10m) (HGHT)
IHDTM surface type (SURF)
IHDTM outflow directions (OUTF)
IHDTM cumulative catchment area (1/400km^2) (CCAR)
ITE Urban/Suburban Land Cover (ITUR)
ITE Land Cover (ITLC)
SAAR 1941-70 (4170)
Potential Evaporation (POTE)
Jenkinson's R (RJEN)

4.2.6 Gazeteer data

AA Developments Gazeteer of place names (AADE)

4.2.7 Miscellaneous

It is possible to map all number of user specified lines, labels and infilled areas as well as point, line, polygon and raster data from users' own files - if it has coordinates, Dgener8 can map it.

Section 5

Controlling Dgener8

5.1 Introduction

Dgener8 is controlled by four-letter commands. For clarity, these MUST be supplied in capitals. A full listing and specification of these commands can be found in Appendix III.

5.2 The three types of Dgener8 command.

There are three types of Dgener8 command:

Active -	These instruct the program to display something in the data display area or the periphery.
Passive -	These have no immediate effect. They control the way in which subsequent active commands will work.
Miscellaneous -	A few commands which fall into neither of the above categories. For example, the command to make Dgener8 enter interactive mode.

It is important to note at this stage that the key and the outer frame are defined by passive commands and are plotted automatically when the map is drawn.

5.2.1 Active Commands

These can be grouped into two types - examples are given in each case.

a) Commands for plotting data held on, or derived from, the National Water Archive databases or (with some exceptions) data held in user-specified files.

CATS -	Plots catchment boundaries (both pre-digitised and IHDTM-derived).
DRAI -	Plots drainage networks (e.g 1:50000 rivers).
DTMO -	Plots IHDTM-derived drainage paths.
DTMP -	Plots IHDTM-derived draingae path from a specified point down to the sea or the edge of the map.
DTMW -	Plots IHDTM-derived drainage paths with width basedon catchment area.
ISOL -	Plots isolines (e.g 1:50000 contours or 1941-70 isohyets).
MAPP -	Plots outlines of published maps (e.g O.S 1:50000).
MILN -	Plots miscellaneous lines (e.g O.S 1:50000 ridge lines).
POIN -	Plots point data (e.g O.S 1:50000 spot heights or river flow gauging stations).
POLY -	Plots polygon boundaries (e.g coastline or lakeshores).
RNGA -	Plots raingauges and their observed rainfall over any specified period.
RNRA -	Plots rainfall grids (raster) summed over any specified period. Periods not held as grids will be computed by interpolation of raingauge data.
RAST -	Plots gridded (raster) data as coloured squares and/ or their numerical value.

b) Commands for plotting lines, symbols and text

BOXX -	Plots a rectangles,as an outline, colour shading (blanking out the area) or both.
DRIP -	Plots the IH drip.
GRID -	Plots a rectangular grid and/or calibrates the borders.
LABL -	Plots a symbol and/or text string.
LINE-	Plots a straight line between two points.

5.2.2 Passive Commands

These can be grouped into four types - examples are given in each case.

a) Commands which define the set-up of the map

AREA -	Defines the geographical area (rectangle) to be mapped.
DEVI -	Defines the deviceon which the map will appear.
INST -	Defines an inset in which data will be plotted.
SCAL -	Defines the scale of the map.
SIZE -	Defines the overall size of the map, (alternative to SCAL).

b) Commands which affect the periphery of the map

BORD -	Defines the layout of the bordersaround the data display area. This also defines whether a key is to be included.
EDCC -	Defines the annotations around the display area.
FRAM -	Defines a frame to go round the entire map.
KEYA -	Defines the annotation (text) to be associated with a particular feature in the key.
TITL -	Defines the titleto go at the top of the key.

c) Commands which define colours and how they are used

BAND -	Defines the relationship between raster values and display colour indices.
CCMY -	Switches to the Hue-Lightness-Saturation colour scheme.
CIND -	Allows the user to define a colour index.
CRAN -	Allows a specified range of colours to be assigned to a specified range of colour indices.
CRGB -	Switches to the Red-Green-Blue colour scheme.

Notes:

1 -	A colour index is a number which is a parameter used by active and passive commands to control the colour of the feature that is being/will be plotted.
2 -	The extensive range of colours defined as Dgener8 system defaults means that, for the majority of applications, the control file will not need to contain any of these commands

d) Commands which define default values

DFCP -	Sets up the default values for command parameters. Applicable to any command (active or passive) for which parameters are required. This is used to precede a Dgener8 command in any of the default files set at project, user or system level.

DFBS - Sets up the default values for background settings such as the specification (e.g type or boldness) of the font used in the data display area or the specification of the fonts used in the various parts of the key.

Notes:

1 - DFBS is not available in Version 1.0

5.2.3 Miscellaneous commands

INCL - Instructs Dgener8 to include the contents of another control file.

INTR - (Not valid in interactive mode.) Instructs Dgener8 to accept commands interactively.

RTRN - (Valid in interactive mode only.) Instructs the program to return to reading in commands from a control file.

5.3 Comment lines

The Dgener8 command processor ignores any lines which start with an asterisk(*). It also ignores blank lines.

Dgener8 is designed to be driven by a series of unique commands that are usually contained in a control file. It is possible to run Dgener8 interactively with commands being entered at the terminal. It is also possible to switch in and out of interactive running as well as including files of Dgener8 commands. This latter facility allows the user to display the same features on several different maps without having to enter large numbers of commands in each individual control file.

5.3 The structure of Dgener8 commands

Each Dgener8 command is made up of a four-letter keyword followed by zero or more parameters. Parameters are ordered in a way so that those most likely to be changed by the user e.g the colour of a line, appear early in the list.

For example, the command to plot isolines is -

```
ISOL data_type colour width style size_of_label
colour_of_label etc. etc
```

(ISOL has 12 parameters in total)

So, to display Ordnance Survey contours in red with a width of 0.1mm and a solid line (Dgener8 style 0) and 2mm label also in red, the command would read -

```
ISOL OSCO red 0.1 0 2.0 red
```

There are another 6 parameters that we have omitted but, we are happy with the defaults that Dgener8 will choose so, we can leave them out.

5.4 Defaults

5.4.1 Concepts

Dgener8 is designed so that if a command is given with parameters missing, it will still produce a display with sensible styles and colours. Any parameters that are supplied by the user will supercede those that Dgener8 would have selected. It is also possible for the user to setup his/her own defaults that are automaticly picked up without having to be included in the command line.

5.4.2 The hierarchy of Dgener8 default files

Dgener8 defaults files exist and operate three levels -

i) a system level - these are the defaults that Dgener8 automaticly locates. These exist in a system file that resides on userid *nrfa*. The file is called *Dgener8.defaults* and cannot be modified by the user.

ii) a user level - these exist on the users own userid in a directory called *~/Dgener8/Dgener8.defaults*. Any settings in this file supercede those set in the system level *Dgener8.defaults*

iii) a project level - these exist in the current directory in a file called *Dgener8.defaults*. Any settings in this file supercede those set in the project and system level *Dgener8.defaults*.

For example, the command to plot IH rivers channels has a default -

```
DRAI IHCH cyan 0.1 0 etc. etc etc.
```

which means that rivers are plotted in cyan with a thickness of 0.1mm and a Dgener8 line style of 0 (solid line). This definition exists in the system file *Dgener8.defaults*.

It may be that, as a user, you always want rivers to be plotted in a dark blue, thick line so, you would make a directory called *~/Dgener8* and create a file called *Dgener8.defaults* that has an entry -

```
DFCP DRAI IHCH blue 0.25
```

So now, whenever the command

```
DRAI IHCH
```

appears in one of your command files, it searches the default files and would plot dark blue thick line rivers.

There then may be an occasion when, for a specific project, rivers always have to be plotted in green so, in the particular directory that corresponds to this project, the user can produce a file called Dgener8.defaults that has the entry -

```
DFCP DRAI IHCH green
```

which means that whenever Dgener8 is run from within this directory, the command

```
DRAI IHCH
```

will result in rivers being mapped in green (they will still be thick because Dgener8 works its way down through the hierarchy of default files before mapping the data type).

Any parameters that are specified in the control file itself supercede those set in default files so, for example, the user may have a default river colour of green but, if the command

```
DRAI IHCH purple
```

appears in a control file, the rivers will be mapped in purple.

5.4.3 System level defaults for commands

As explained above, a default exists for each data type so, if the user is satisfied with these, he/she need never be concerned with parameters. However, there will come a time when a different device is required or when a plot needs to be taylored.

A list of defaults for all commands can be found in Appendix I.

5.5 Producing maps - commands grouped by function.

When producing a map, there are many things, other than the data to be displayed, that need to be considered. The required usage will dictate the area and scale, whether or not a key is present, the borders around the display area and the annotation within this border area. The commands that do this are -

5.5.1 The overall size and layout

DEVI - defines the device and, therefore, the medium on which the map is to be displayed. The physical size of the completed map can be constrained by this.

AREA - defines the geographical area that is to be mapped (this combined with the SCAL command dictates the physical size of the mapped area).

SCAL - defines the scale of the mapped area (this combined with the AREA command dictates the physical size of the mapped area).

SIZE - This can be used as an alternative to SCAL. By defining the physical size of the mapped area, Dgener8 will use the information supplied with the AREA command to calculate the correct scale.

BORD - controls the border widths, key width and key location (left or right)

5.5.2 Map display contents

The commands that map data and plot map-enhancing features in the display area are -

CATS - maps catchment boundaries (both pre-digitised and IHDTM-derived)

DRAI - maps drainage networks (e.g 1:50000 rivers)

DTMO- maps IHDTM-derived drainage paths

DTMP- maps IHDTM-derived drainage path from a specified point down to the sea or the edge of the display area

DTMW - maps IHDTM-derived drainage paths with width based on catchment area

GAZR - maps place names
ISOL - maps isolines (e.g 1:50000 contours, FSR etc. isohyets)
MAPP - maps outlines of published maps (e.g O.S Landranger)
MILN - maps miscellaneous lines (e.g O.S 1:50000 ridge lines)
POIN - maps point data (e.g O.S 1:50000 spot heights, gauging stations etc.)
POLY - maps polygon boundaries (e.g O.S 1:50000 lakesshores, coastline etc.)
RNGA - maps raingauges and their observed rainfall over any specified period
RNRA - maps rainfall grids (raster) summed over any specified period. Periods not held in grids will be computed by interpolation of raingauge data.
RAST - maps gridded (raster) data as coloured squares and/or their numerical value
SOIL - maps gridded soil type data

The following commands are those that can be used to highlight, enhance or personalise areas of the display area -

BOXX - maps a rectangle, as an outline, colour shading (blanking out the area) or both
DRIP - maps the IH drip
GRID - maps a rectangular grid and/or calibrates the borders
LABL - maps a symbol and/or text
LINE - maps a straight line between two points

5.5.3 Map Key

The key is an important part of producing a usable and professional looking map. Dgener8 supplies a number of facilities to achieve this. The commands are -

KEYA - Defines the annotaion that should appear in the key for a specific data type
KLOC - Shows an outline of the country containing the display area with this display area highlighted. It also shows the relevant 1:50000 maps that cover the display area
NOTE - Allows a quantity of text to appear in the key - this text may be held in a file thus eliminating the need to type it into each control file
TITL - Defines the title of the map

5.5.4 Setting new defaults

The Dgener8 system of storing default settings for all commands and data types has already been explained. The files that contain these defaults, all of which are called Dgener8.defaults (they reside in directories at a system, user and project level) contain a list of Dgener8 commands, each of which are preceded by one of the following -

DFCP - Sets the defaults values for command parameters. Applicable to any command (active or passive) for which parameters are required
DFBS - Sets the default values for background settings such as the specification (e.g font or boldness) of the font used in the display area or the specification of the fonts used in the various parts of the key.

5.5.5 Miscellaneous

Commands that provide special facilities in Dgener8 are -

INCL -	Includes a Dgener8 control file within the current Dgener8 control file.
INTR -	Switches Dgener8 from being controlled by a control file to control by input from the terminal.
INST -	Adjusts the Dgener8 environment to allow mapping into an inset in the main display area.
RTRN -	Returns Dgener8 from interactive control to control by a control file.

5.6 Command Order

Dgener8 will produce a simple map from a single command to map data. For example, DRAI IHCH will result in a map of IH channels on the Isle of Wight. However, when specific maps are required, the user needs to make a number of decisions - output device, area, scale, contents, key contents etc.

All Dgener8 command files are parsed before run time so, commands specifying the device, the type of frame etc. can come anywhere in the command file. However, active commands should only be appear after the specification of the required display area i.e after one or all of these AREA, SCAL (or SIZE) and BORD. This is because it is permissable to have more than one AREA command in a command file so any active commands relate to the most recent call to AREA.

5.7 Reading geographical data from users' files

The strength of Dgener8 is its ability to access the different data holdings within IH without the user having knowledge of the methods by which it is held. However, there are times when a user will wish to display data that is held in a file. This is done by using the active command that applies to the data type e.g if the file contained polygons, the command POLY would be used with the Dgener8 data type of FILE. The line imediately following this would contain the the file format and the file name.

For example, we have a file called *my.lakes* that exists in */users/nwa/nrfa/Dgener8*. The data is in Arc/Info Ungenerated format.

To map this data we use the commands -

```
POLY FILE
FILE ARCG /users/nwa/nrfa/Dgenr8.defaults
```

This protocol is used for all file-held data. The first parameter of the FILE command indicates the format of the data in the file. For a list of formats that Dgener8 can handle, see Appendix II.

Section 6

Tutotrial 2

6.1 Tutotrial 2a - keys, borders and titles

Look at the contents of the file dg8_tut_2a by typing -

more dg8_tut_2a

You will see commands that did not appear in Tutorial 1. In this exercise we look at the way that the key, its contents and the borders are controlled.

You may notice that this tutorial is similar to the very first (dg8_tut_1a) but with the extra commands TITL, BORD and KEYA. These control the title, the border (and key) widths and the key entries respectively.
Type -

dg8_tut_2a

You will now notice that, instead of an untitled plot with no key-entries, there now appears a more informative key. Remove the map as before and then, using the editor of your choice, edit the file dg8_tut_2a.

The second line,

```
TITL Tutotrial 2a
```

should be edited to -

```
TITL Catchment 39051
```

You will notice that the last parameter of the BORD command is 'R'. This dictates that the key will appear on the right side of the plot. So, edit the line

```
BORD 20. 10. 20. 10. 100. R
```

to

```
BORD 20. 10. 20. 10. 100. L
```

Also, edit the line

```
KEYA Rivers
```

to

```
KEYA IH Digital Rivers
```

NOTE: The command KEYA applies to the next active command; in this case DRAI and it controls the text that appears in the key.

Save the file and, once again, type -

dg8 dg8_tut_2a

You should now see a similar map to before but with a more informative title in the key which now appears on the left. To suppress the key (and/or the borders), the parameters in BORD should be set to 0..

6.2 Tutorial 2b - IHDTM outflow paths

Look at the contents of the file dg8_tut_2b by typing -

more dg8_tut_2b

In this exercise we look at a Dgener8 feature that is distinctly hydrological. By using the IHDTM, a river network can be derived. Only channels that have a catchment greater than a specified value are displayed.

You may notice that this tutorial is similar to the very first (dg8_tut_1a) but with the extra command DTMO. This plots a derived network.

Type -

dg8 dg8_tut_2b

You will now see a derived set of rivers with the vector rivers superimposed. Using the editor of your choice, edit the file dg8_tut_2b.

The second line,

```
DTMW 1 0.3 2 0.2
```

should be edited to -

```
DTMW 1 0.01 2 0.2
```

Save the file and, once again, type -

dg8 dg8_tut_2b

You should now see a similar map to before but with a derived river network that extends well beyond the sources of the vector set. This is because you have changed the threshold at which the rivers begin to appear. This command can be used to great effect when producing maps at smaller scales as it provides river sets at infinitely variable scales. DTMW can also be used to display the network with channel widths proportional to their catchment area.

6.3 Tutorial 2c - insets

Look at the contents of the file dg8_tut_2c by typing -

more dg8_tut_2c

In this exercise we look at a Dgener8 feature that allows you to zoom-in on an area or, plot more data in one specific area.

You may notice that this tutorial is similar to dg8_tut_1b but with the extra command INST. This allows insets to be plotted within the display area.

Type -

dg8 dg8_tut_2c

You will now see height shading with an inset that shows contours and lakes. You have full control over the inset in size, location, scale and content. Using the editor of your choice, edit the file dg8_tut_2c.

The fifth line,

```
INST 300500 300500 301500 301500 14 1.0 0 302000 302000 1.5
```

should be edited to -

```
INST 302500 302500 303500 303500 6 1.0 0 300250 300250 2.0
```

Save the file and, once again, type -

dg8 dg8_tut_2c

You should now see a similar map to before but with a different inset that is enlarged and repositioned. This is because you have changed the x,y coordinates and the magnification of the inset box.

6.4 Tutorial 2d - raster rainfall and raingauges

Look at the contents of the file dg8_tut_2d by typing -

more dg8_tut_2d

In this exercise we look at a different raster dataset - the 1km gridded SAAR-4170.

The command BAND that appears before RAST specifies the value/colour changes for raster data. The defaults are set to sensible values but, there are times when you may wish to alter these.

The command BAND is followed by a set of parameters (there can be as many or as few as you like) and they specify colour, value, colour, value, colour etc.

The command

```
BAND 4170 5 50. 31 60. 32 70. 33 80. 34 90. 35 100. 36 110.
37 120. 38 130. 39 140. 40
```

indicates that values below 50. will be coloured 5 (cyan) and values between 50. and 60. will be coloured 31 (red) etc.

The command

```
CRNM 31 40 red blue
```

defines a range of colours for a set of colour indices, in this case the colour indices from 31 to 40 are coloured from red to blue over a smooth scale i.e 31 represents red and 40 represents blue.

Type -

dg8 dg8_tut_2d

You will now see SAAR values for Wales with the colour red indicating drier areas and blue indicating wetter areas. Using the editor of your choice, edit the file dg8_tut_2d.

The third line,

```
CRNM 31 40 red blue
```

should be edited to -

```
CRNM 31 40 green brown
```

Save the file and, once again, type -

dg8 dg8_tut_2d

You should now see a similar map to before but with colours going from green to brown. Experiment with the change points in the command BAND i.e the second, fourth, sixth etc, values and see how the shading changes.

NOTE: The change values MUST be in ascending order and the list of parameters must start and finish with a colour index.

6.5 Tutorial 2e - subcatchments coloured according to water quality

Look at the contents of the file dg8_tut_2e by typing -

more dg8_tut_2e

In this exercise we look at plotting catchments with a solid infill colour in order to highlight them. The plot shows a number of nested catchments which are currently transparent.

Type -

dg8 dg8_tut_2e

You will now see a number of catchments but, if we wanted to shade them according to a particular attribute we can specify infill. Using the editor of your choice, edit the file dg8_tut_2e.

The third line,

```
CATS DTMD 583450 208800 10 0.2 0 0
```

should be edited to -

```
CATS DTMD 583450 208800 10 0.2 0 3
```

Also, edit the fourth, fifth, sixth and seventh lines so that the seventh parameter is set to 6.

Save the file and, once again, type -

dg8 dg8_tut_2e

You should now see a similar map to before but with solid infill. This is because the parameter for infill has been set to a Dgener8 colour index.

This use of Dgener8 for highlighting polluted catchments was commisioned by NRA HQ for a study of catchment compliance with EC directives.

6.6 Tutorial 2f - large scale plots

So far, we have concentrated on screen-size and A4 plots but, Dgener8's initial design criteria involved the production of large scale maps, upto A0. Look at the file dg8_tut_2f by typing -

more dg8_tut_2f

You will notice that the command 'DEVI POST' has a number of parameters. These specify the paper size in millimetres and whether the paper should be rotated (this provides the facility for landscape on A4).

Look at the commands in this file and notice the command

```
SCAL 50000
```

This ensures that the final map is at a scale of 1:50000 instead of letting Dgener8 scale the map to fit the device. Using Appendix III, check the specification of any commands that you are not familiar with and try to envisage the final plot. Once you have done this, type -

dg8 dg8_tut_2f

This will take a few minutes to run as a large amount of data has been requested. When it has finished there should be a file called

dg8_tut_2f.POST

Send this to the Versatec Electrostatic plotter by typing -

versplot dg8_tut_2f.POST

When it has been plotted it should appear in room 137. Allow half a day for this to appear. You now have your first large-scale Dgener8 plot.

Section 7

Possible problems

7.1 FORTRAN, UNIRAS or ORACLE not setup

If you have not setup one or more of the above, Dgener8 will warn you of this and terminate. If you are unfamiliar with the 'setup' command, seek assistance from the Help Desk.

7.2 UNIRAS or ORACLE unavailable

Due to an intermittent fault on some operating systems, ORACLE and/or UNIRAS can 'disappear'. When this happens, Dgener8 will stop. They 'tend' to reappear within a minute ot two.

7.3 Plot file size excedes available disk space

Dgener8 will terminate in an uncontrolled way. A warning message shouldappear in your console window.

7.4 Plot file too big for the plotter software

When producing maps with enormous amounts of data e.g plot files greater than 150Mb, problems can arise when the plotting software attempts to rasterise the image. There are no ways around this other than reducing the size or contents of your map. However, it is unlikely that your map will be near to 150Mb.

7.5 Illegal command

Dgener8 issues a warning when encountering non-Dgener8 commands. Processing continues.

7.6 Performance

The speed that maps are produced either to screen of file depends on the machine specification and the load on the machine. Plotting large amounts of data to thescreen can be time consuming.

7.7 Known bugs

The recent move to a new version of the ORACLE pre-compiler (Pro*Fortran 1.4) has introduced a bug on Silicon Graphics machines. If a large amount of vector data is requested, the virtual memeory allocation breaksdown and all processes become slower and slower. If you notice this happening, kill the job. This problem does NOT occur on Suns. So, if you have a large number of vectors to plot, use a Sun. Note: This is a problem in the software that Dgener8 uses. It is not a bug in Dgener8.

Appendix I

Available Datasets

This appendix lists the available datasets and their Dgener8 default settings. A two line entry exists for each data type. The first line describes the dataset, the second shows the full set of default parameter settings should you request that dataset. For the raster datasets, a third line describes the shading colours and their related change points.

AI.1 Point Datasets

i) Ordnance Survey 1:50000 Spotheights
POIN OSSH 10 3.0 3225 2.0 1 0.1 0 3 1 -99999999 99999999

ii) Raingauges
POIN RNGA 2 3.0 850 2.0 2 1.0 0 3 1 -99999999 99999999

iii) File based data
POIN FILE 10 3.0 850 2.0 2 1.0 0 3 1 -99999999 99999999

AI.2 Isoline Datasets

i) Ordnance Survey 1:50000 Contours
ISOL OSCO 2 0.2 0 1.5 2 0.1 0 500 0.4 -99999999 99999999

ii) SAAR 4170
ISOL 4170 10 0.1 0 1.5 10 1.0 0 50 0.4 -99999999 99999999

iii) Potential Evaporation
ISOL POTE 10 10 0.1 0 1.5 10 1.0 0 50 0.4 -99999999 99999999

iv) File based data
ISOL FILE 10 10 0.1 0 1.5 10 1.0 0 50 0.4 -99999999 99999999

AI.3 Miscellaneous Line Datasets

i) Ordnance Survey 1:50000 Break lines
MILN OSBR 2 0.1 4 0.0 -1 0.1 0 50 0 0.1 -99999999 99999999

ii) Ordnance Survey 1:50000 Form lines
MILN OSBR 7 0.1 4 0.0 -1 0.1 0 50 0 0.1 -99999999 99999999

iii) Ordnance Survey 1:50000 Ridge lines

MILN OSBR 6 0.1 4 0.0 -1 0.1 0 50 0 0.1 -99999999 99999999

iv) Northern Ireland/Irish Republic Boarder
MILN NIBD 10 0.1 4 0.0 -1 0.1 0 50 0 0.1 -99999999 99999999

v) File based data
MILN FILE 10 0.1 0 0.0 -1 0.1 0 50 0 0.1 -99999999 99999999

AI.4 Polygon Datasets

i) Ordnance Survey 1:50000 Coastline
POLY OSCS 10 0.4 0 -1 -1 0.0 -1 0.1 0 -99999999 99999999

ii) Ordnance Survey 1:50000 Lakes
POLY OSLK 4 0.2 0 -1 -1 1.5 4 0.1 0 -99999999 99999999

iii) IH 1:250000 Coastline
POLY C250 10 0.4 0 -1 -1 0.0 -1 0.1 0 -99999999 99999999

iv) File based data
POLY FILE 6 0.2 0 -1 -1 0.0 -1 0.1 0 -99999999 99999999

AI.5 Catchment Datasets

i) Gauging Station Digitised Catchments
CATS GAUG * * 4 0.4 0 -1 -1 -1 -1 2.5 4 3 0

ii) IH Digital Terrain Model Derived Catchments
CATS DTMD * * 4 0.4 0 -1 -1 -1 -1 2.5 4 3 0

iii) File based data
CATS FILE * * 4 0.4 0 -1 -1 -1 -1 2.5 4 3 0

AI.6 Drainage Datasets

i) IH 1:50000 Drainage Channels
DRAI IHCH 5 0.1 0 -1 0.0 -1 0.1 0 -1 0. -1 0. -1 0. -1 0. 0 -1 0. -1 0. 0

ii) IH 1:50000 Rivers
DRAI IHRV 5 0.1 0 -1 0.0 -1 0.1 0 -1 0. -1 0. -1 0. -1 0. 0 -1 0. -1 0. 0

iii) IH 1:50000 Canals
DRAI IHCN 3 0.1 0 -1 0.0 -1 0.1 0 -1 0. -1 0. -1 0. -1 0. 0 -1 0. -1 0. 0

iv) Ordnance Survey 1:250000 Drainage Channels
DRAI R250 5 0.1 0 -1 0.0 -1 0.1 0 -1 0. -1 0. -1 0. -1 0. 0 -1 0. -1 0. 0

v) File based data
DRAI IHRV 5 0.1 0 -1 0.0 -1 0.1 0 -1 0. -1 0. -1 0. -1 0. 0 -1 0. -1 0. 0

AI.7 Raster Datasets

i) IH Digital Terrain Model Heights
RAST HGHT 5 0.1 5 -1 0.0 0 0 0 1 -99999999 99999999
BAND HGHT 5 0. 41 10. 42 20. 43 30. 44 50. 45 100. 46 200. 47 300. 48 400. 49 600. 50

ii) IH Digital Terrain Model Surface Type
RAST SURF 5 1.0 5 -1 0.0 0 0 0 0 -99999999 99999999
BAND SURF 0 -0.5 0 0.5 5 1.5 3 2.5 4 3.5 5

iii) 1km SAAR 4170
RAST 4170 5 0.1 5 -1 0.0 0 0 0 1 -99999999 99999999
BAND 4170 5 50. 31 60. 32 70. 33 80. 34 90. 35 100. 36 110. 37 120. 38 130. 39 140. 40

iv) 1km Jenkinson's R
RAST RJEN 5 1.0 5 -1 0.0 0 0 0 1 -99999999 99999999
BAND RJEN 31 5. 32 10. 33 20. 34 25. 35 30. 36 35. 37 40. 38 45. 39 50. 40

v) M5 2 day
RAST M52D 0 1.0 1 -1 0.0 0 0 0 1 -99999999 99999999
BAND M52D 31 60. 32 80. 33 100. 34 120. 35 140. 36 160. 37 180. 38 200. 39 220. 40

vi) 1km Potential Evaporation
RAST POTE 5 1.0 5 -1 0.0 0 0 0 1 -99999999 99999999
BAND POTE 31 250. 32 275. 33 300. 34 325. 35 350. 36 375. 37 400. 38 425. 39 450. 40

vii) 1km Monthly Rainfall (the format for this is R86A for January 1986, R86B for February 1986 etc. Just one example given)
RAST R86A 5 1.0 5 -1 0.0 0 0 0 1 -99999999 99999999
BAND R86A 40 5. 39 15. 38 25. 37 35. 36 45. 35 55. 34 65. 33 75. 32 85. 31

viii) Institute of Terrestrial Ecology Land Cover Data
RAST ITLC 0 1.0 5 -1 0.0 0 0 0 1 -99999999 99999999
BAND ITLC 24 1.5 4 2.5 17 3.5 14 4.5 23 5.5 24 6.5 24 7.5 24 8.5 23 9.5 26 10.5 6 11.5 29 12.5 6 13.5 16 14.5 3 15.5 13 16.5 0 17.5 9 18.5 17 19.5 gray80 20.5 gray60 21.5 21 22.5 8 23.5 black

ix) Institute of Terrestrial Ecology Urban and Suburban Coverage (use carefully!)
RAST URBN 5 1.0 5 -1 0.0 0 0 0 0 0.5 1.5
BAND URBN 0 0.5 21

x) Ordnance Survey 1:50000 Landranger Maps (sample only)
RAST OSLR 0 1.0 5 -1 0.0 0 0 0 1 -99999999 99999999
BAND OSLR 30 0.5 31 1.5 32 2.5 33 3.5 34 4.5 35 5.5 36 6.5 37 7.5 38 8.5 39 9.5 40 10.5 41 11.5 42 12.5 43 13.5 44 14.5 45

AI.8 Soil Datasets

xi) IH/SSLRC/MLURI 1km Soil Classification
SOIL HOST 0 1.0 1 -1 0.0 0 0 0 1 0.5 99999999
BAND HOST 71 1.5 72 2.5 73 3.5 74 4.5 75 5.5 76 6.5 77 7.5 78 8.5 79 9.5 80 10.5 81 11.5 82 12.5 83 13.5 84 14.5 85 15.5 86 16.5 87 17.5 88 18.5 89 19.5 90 20.5 91 21.5 92 22.5 93 23.5 94 24.5 95 25.5 96 26.5 97 27.5 98 28.5 99

AI.9 Gazeteer Datasets

i) AA Developments
GAZR AADE 10 7.0 6.0 5.0 3.0 2.5 2.2 2.0 2.0 2.0 2.0

ii) File based data
GAZR FILE 10 7.0 6.0 5.0 3.0 2.5 2.2 2.0 2.0 2.0 2.0

AI.10 Miscellaneous

i) IH Drip
DRIP -1 -1 -1 5 20 5 20

ii) IH Digital Terrain Model Flow Directions
DTMO 2 0.1 0 0 99999999

iii) IH Digital Terrain Model Proportional Width Channels
DTMW 2 0.3 5 0.1 2. 10000.

iv) Flow Path to the Sea
DTMP -1 -1 2 0.1 0

v) Screen size
DEVI SCRN 295. 205. N white

vi) PostScript size
DEVI POST 205. 295. Y white

Appendix II

Styles and Formats

This appendix lists the available colours, line styles, marker types, text control facilities and file formats.

AII.1 Dgener8 Colour Index

The Dgener8 colour table has 256 (numbered 0 - 255) possible entries of which indices 0 - 99 are currently used. The user can modify these entries or add new ones. The default scheme is based on a Hue, Lightness and Saturation (HLS). However, the user can switch between HLS, Red-Green-Blue (RGB) and Cyan-Magenta-Yellow (CMY). To modify the colour table, see the commands CCMY, CFIL, CHLS, CIND, CRAN, CRNM and CRGB.

Index	Dgener8 Colour	X Colour
0	Background	N/A
1	Anti-background	N/A
2	Red	red
3	Green	green
4	Blue	blue
5	Cyan	cyan
6	Magenta	magenta
7	Yellow	yellow
8	Orange	orange
9	Brown	brown
10	Black	black
11	Dark Grey	dimgray
12	Crimson	crimson
13	Jade	darkgreen
14	Indigo	indigo
15	Aquamarine	cyan4
16	Purple	purple4
17	Ocre	goldenrod
18	Terracotta	peru
19	Chestnut	saddlebrown
20	White	white
21	Light Grey	grey75
22	Pink	pink
23	Lime	palegreen
24	Sky Blue	skyblue
25	Turquoise	turquoise
26	Mauve	plum2
27	Primrose	palegoldenrod
28	Tangerine	peachpuff
29	Beige	bisque3
30	Grey	grey50

Index	Dgener8 Colour	X Colour
31	Red	red
	31 - 40 are an even progression from red to blue. This is ideal for shading raster data e.g SAAR 4170 with red as driest and blue the wettest.	
40	Blue	blue
41	Green	green
	41 - 50 are an even progression from red to blue. This is ideal for shading raster data e.g HGHT with green as lowlands and brown as highlands.	
50	Brown	brown
51	Green	green
	51 - 70 are an even progression from red to blue. This is ideal for shading raster data e.g HGHT with green as lowlands and brown as highlands.	
70	Brown	brown
71		
	71 - 99 are the HOST soil class colours devised by David Boorman.	
99		

When supplying a colour index as a parameter, it is permissable to give the equivalent X colour name. For example, to plot rivers in cyan would be -

```
DRAI IHCH 5
```

or, alternatively,

```
DRAI IHCH cyan
```

AII.2 Dgener8 line styles

There are eleven Dgener8 line styles that can be seen in Fig AII.1. It should be noted that the spacing of dots and dashes is proportional to the width of the line that is being displayed.

The default line style in Dgener8 is 0, the solid line.

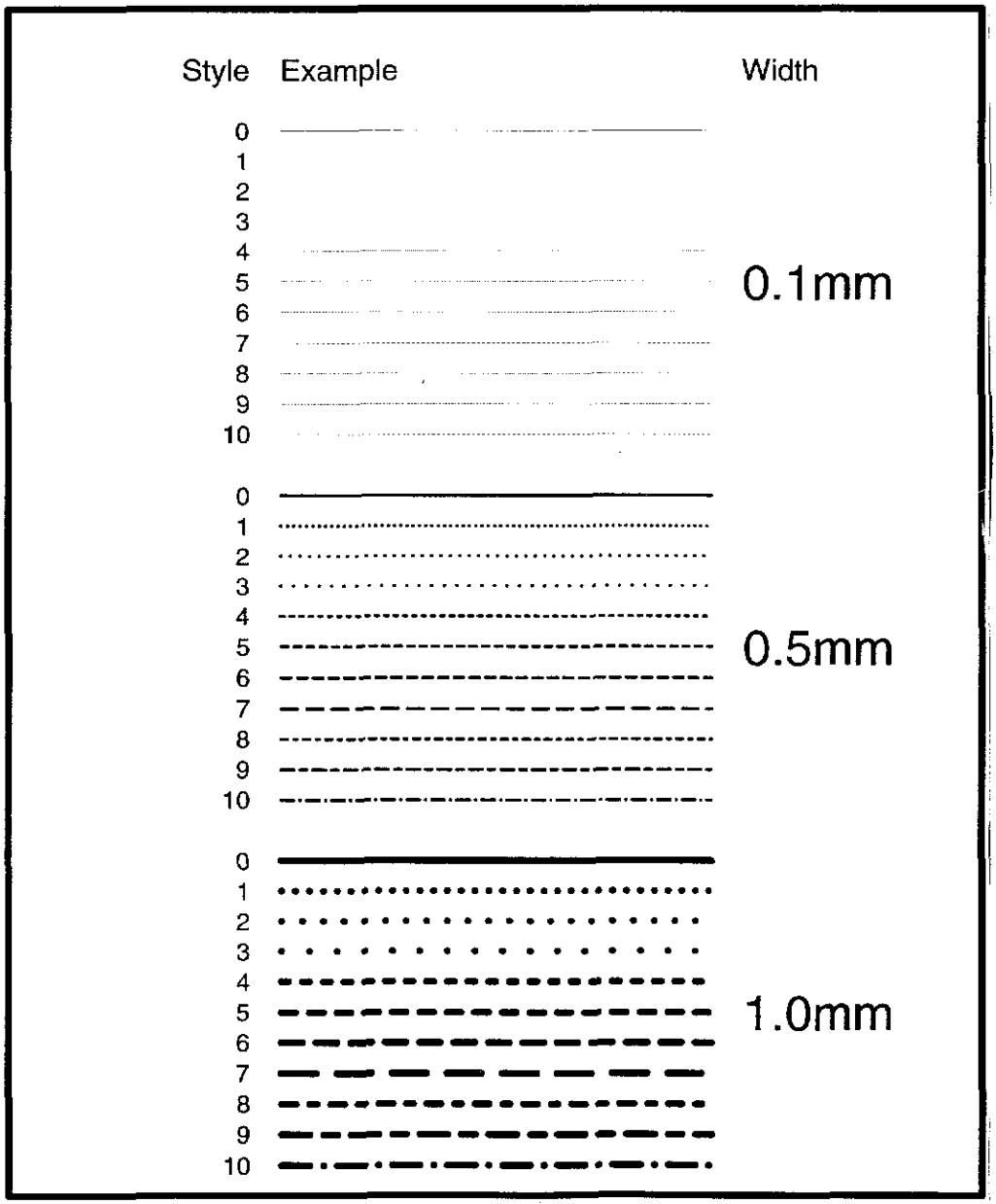


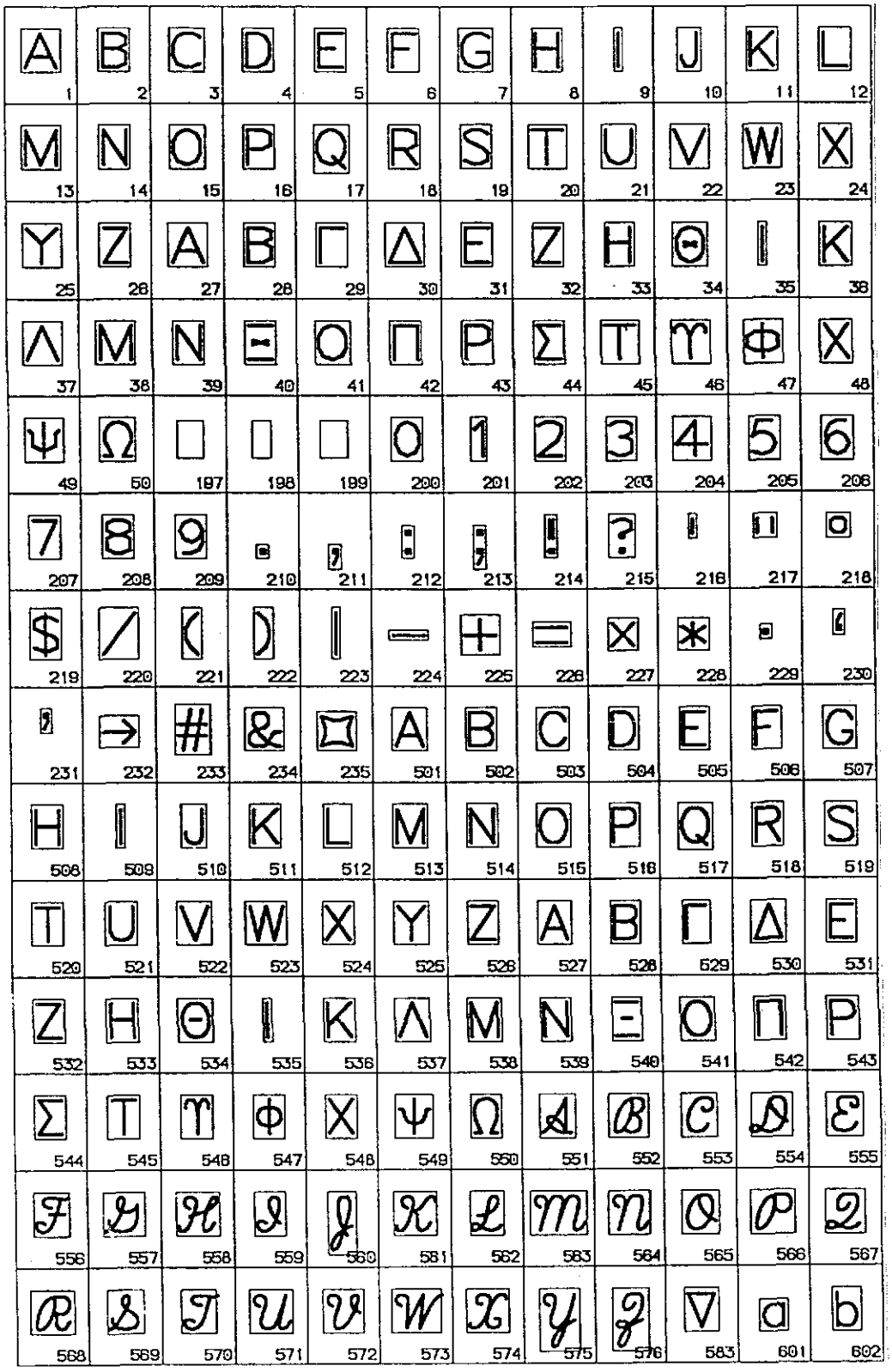
Figure AII.1 Dgener8 line styles

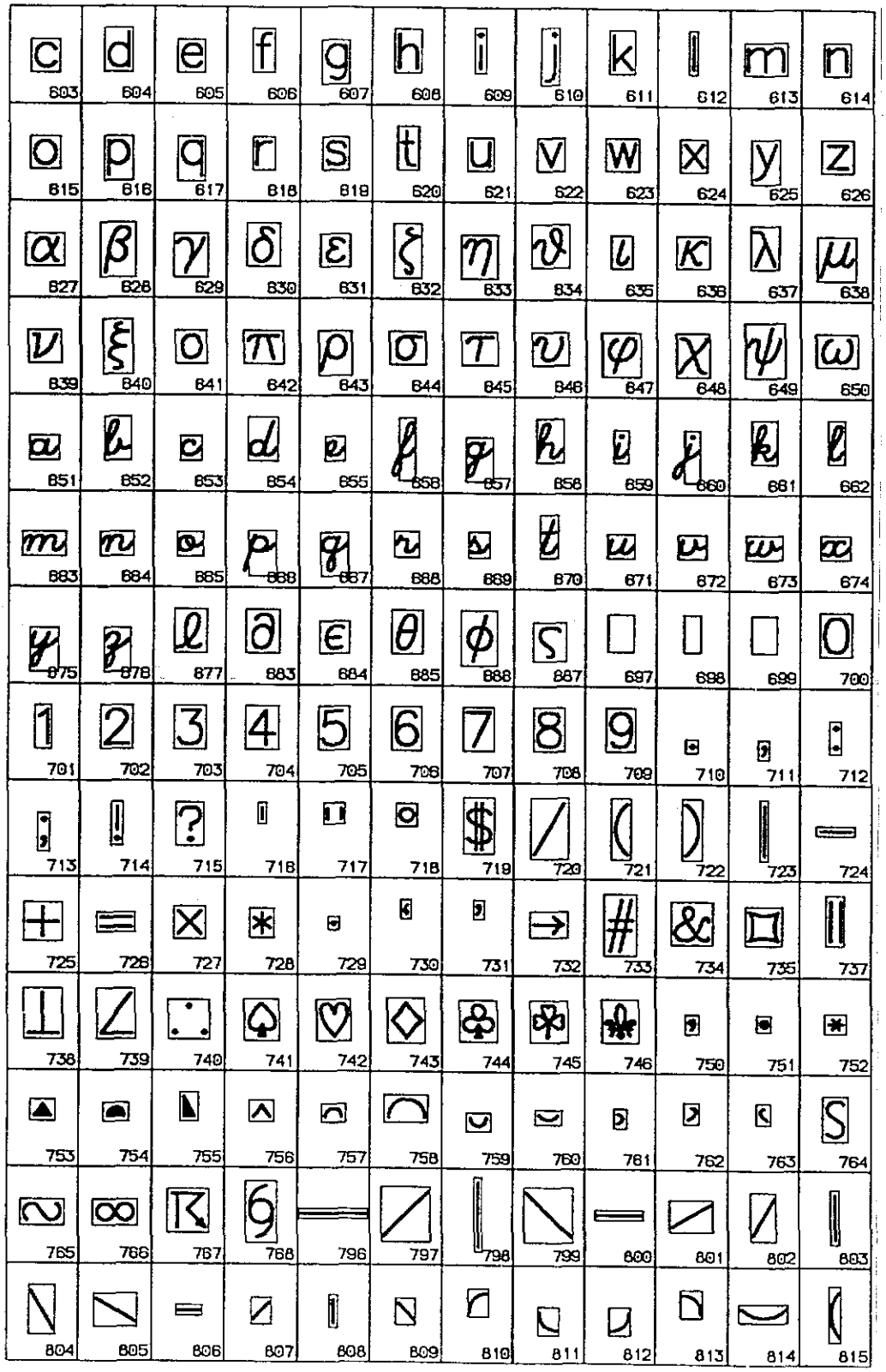
AII.3 Dgener8 point markers

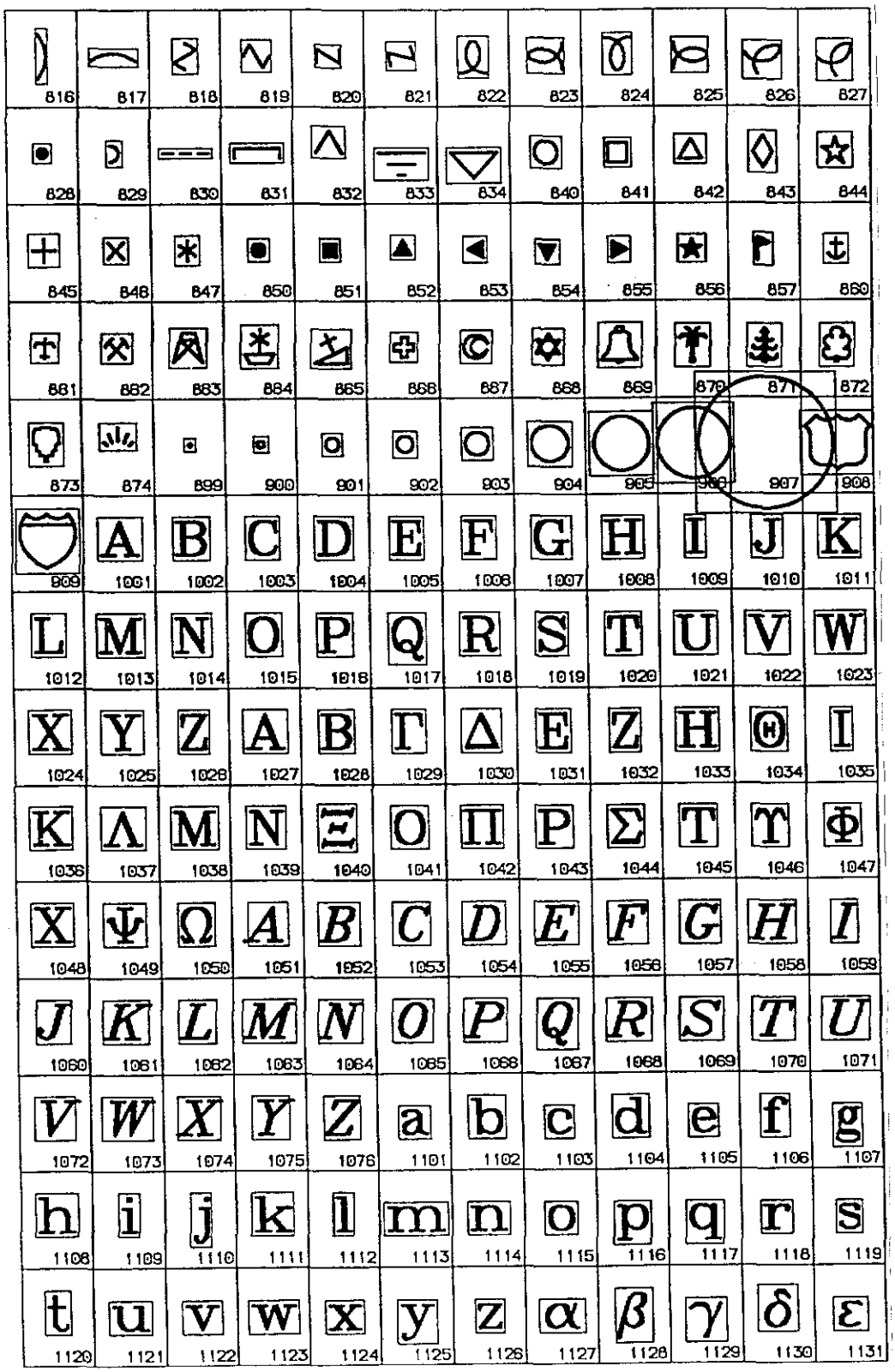
Dgener8 has two thousand four hundred and ninety six available markers. They are used for marking positions (spotheights, wells etc.) or as special characters embedded in text such as copyright or registered trademark symbols.

If you wish to use any of the available Dgener8 markers within text e.g for the title or key annotations, see AII.4 Dgener8 Text.

Tables of the available markers with their relevant identifiers are supplied on the following pages.


A 1
B 2
C 3
D 4
E 5
F 6
G 7
H 8
I 9
J 10
K 11
L 12
M 13
N 14
O 15
P 16
Q 17
R 18
S 19
T 20
U 21
V 22
W 23
X 24
Y 25
Z 26
A 27
B 28
Γ 29
Δ 30
E 31
Z 32
H 33
Θ 34
I 35
K 38
Λ 37
M 38
N 39
Ξ 40
O 41
Π 42
P 43
Σ 44
T 45
Υ 46
Φ 47
X 48
Ψ 49
Ω 50
197
198
199
0 200
1 201
2 202
3 203
4 204
5 205
6 206
7 207
8 208
9 209
210
211
212
213
214
215
216
217
218
$ 219
220
(221
) 222
223
224
225
226
227
228
229
230
231
232
233
& 234
235
A 501
B 502
C 503
D 504
E 505
F 506
G 507
H 508
I 509
J 510
K 511
L 512
M 513
N 514
O 515
P 516
Q 517
R 518
S 519
T 520
U 521
V 522
W 523
X 524
Y 525
Z 526
A 527
B 528
Γ 529
Δ 530
E 531
Z 532
H 533
Θ 534
I 535
K 536
Λ 537
M 538
N 539
Ξ 540
O 541
Π 542
P 543
Σ 544
T 545
Υ 548
Φ 547
X 548
Ψ 549
Ω 550
551
552
553
554
555
556
557
558
559
560
581
562
583
564
565
566
567
568
569
570
571
572
573
574
575
576
583
a 601
b 602


603 604 605 606 607 608 609 610 611 612 613 614
615 616 617 618 619 620 621 622 623 624 625 626
627 628 629 630 631 632 633 634 635 636 637 638
639 640 641 642 643 644 645 646 647 648 649 650
651 652 653 654 655 656 657 658 659 660 661 662
663 664 665 666 667 668 669 670 671 672 673 674
675 676 677 683 684 685 688 687 697 698 699 700
701 702 703 704 705 706 707 708 709 710 711 712
713 714 715 716 717 718 719 720 721 722 723 724
725 726 727 728 729 730 731 732 733 734 735 737
738 739 740 741 742 743 744 745 746 750 751 752
753 754 755 756 757 758 759 760 761 762 763 764
765 766 767 768 796 797 798 799 800 801 802 803
804 805 806 807 808 809 810 811 812 813 814 815


816 817 818 819 820 821 822 823 824 825 826 827
828 829 830 831 832 833 834 840 841 842 843 844
845 846 847 850 851 852 853 854 855 856 857 860
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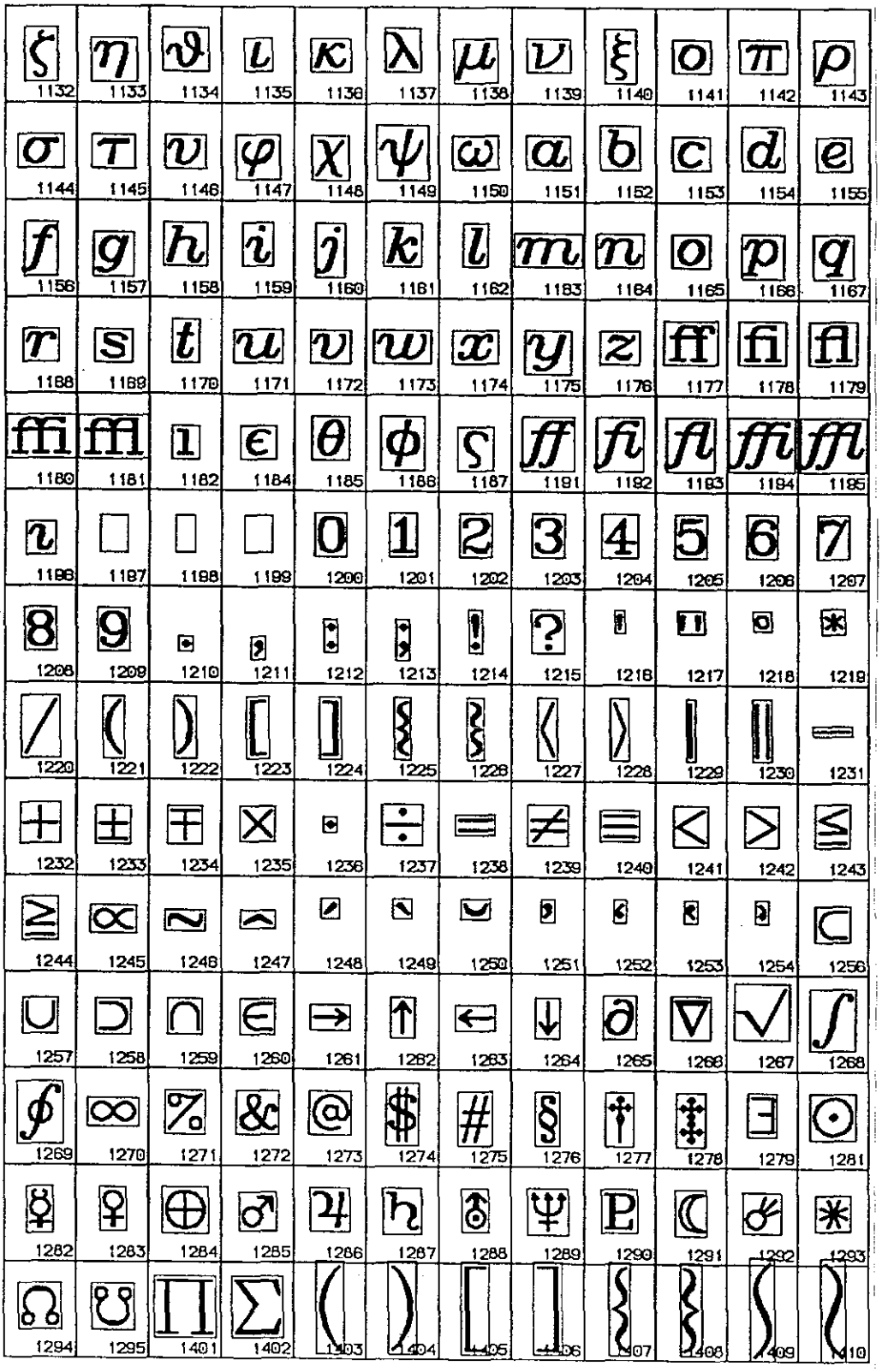
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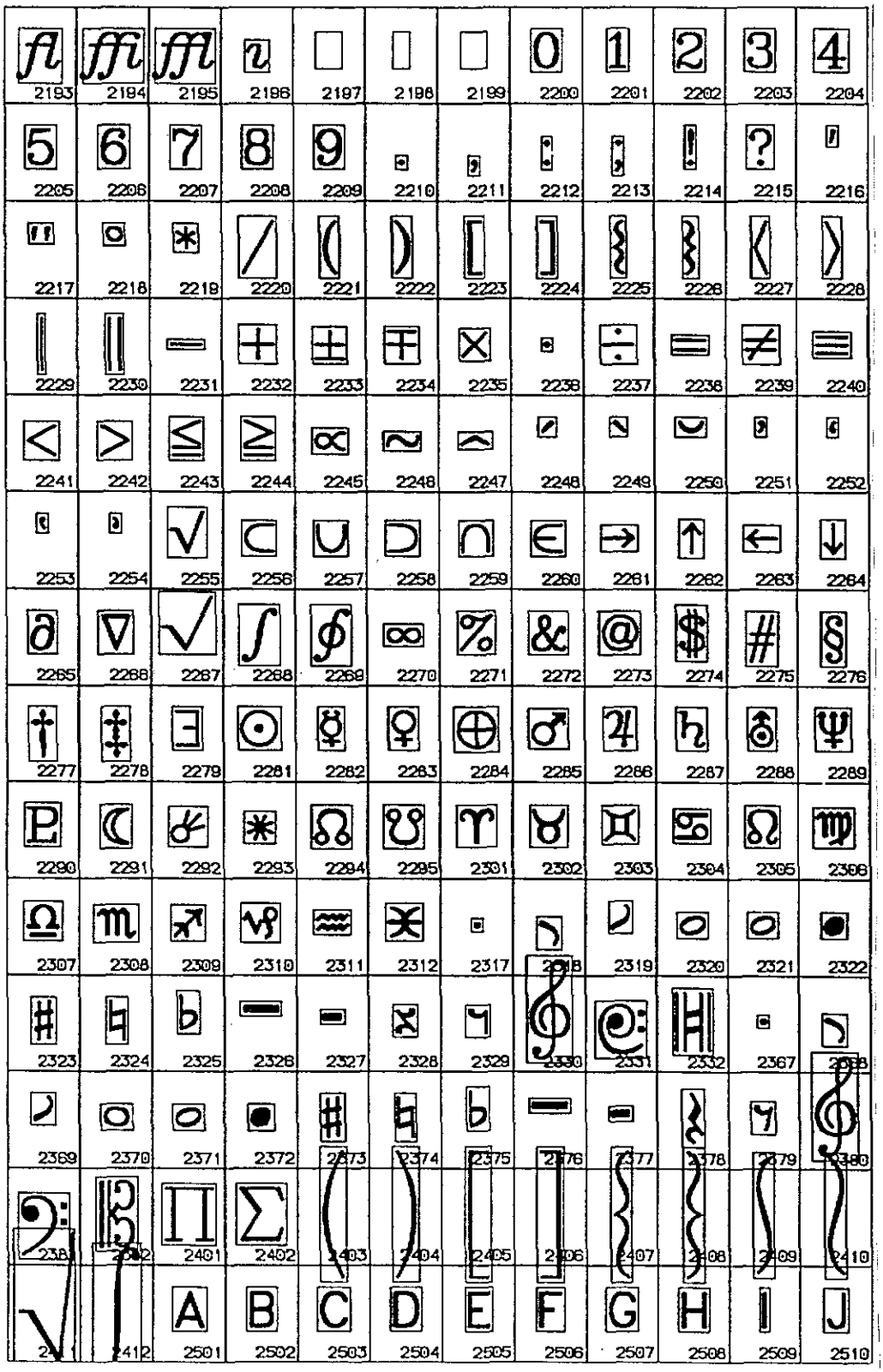
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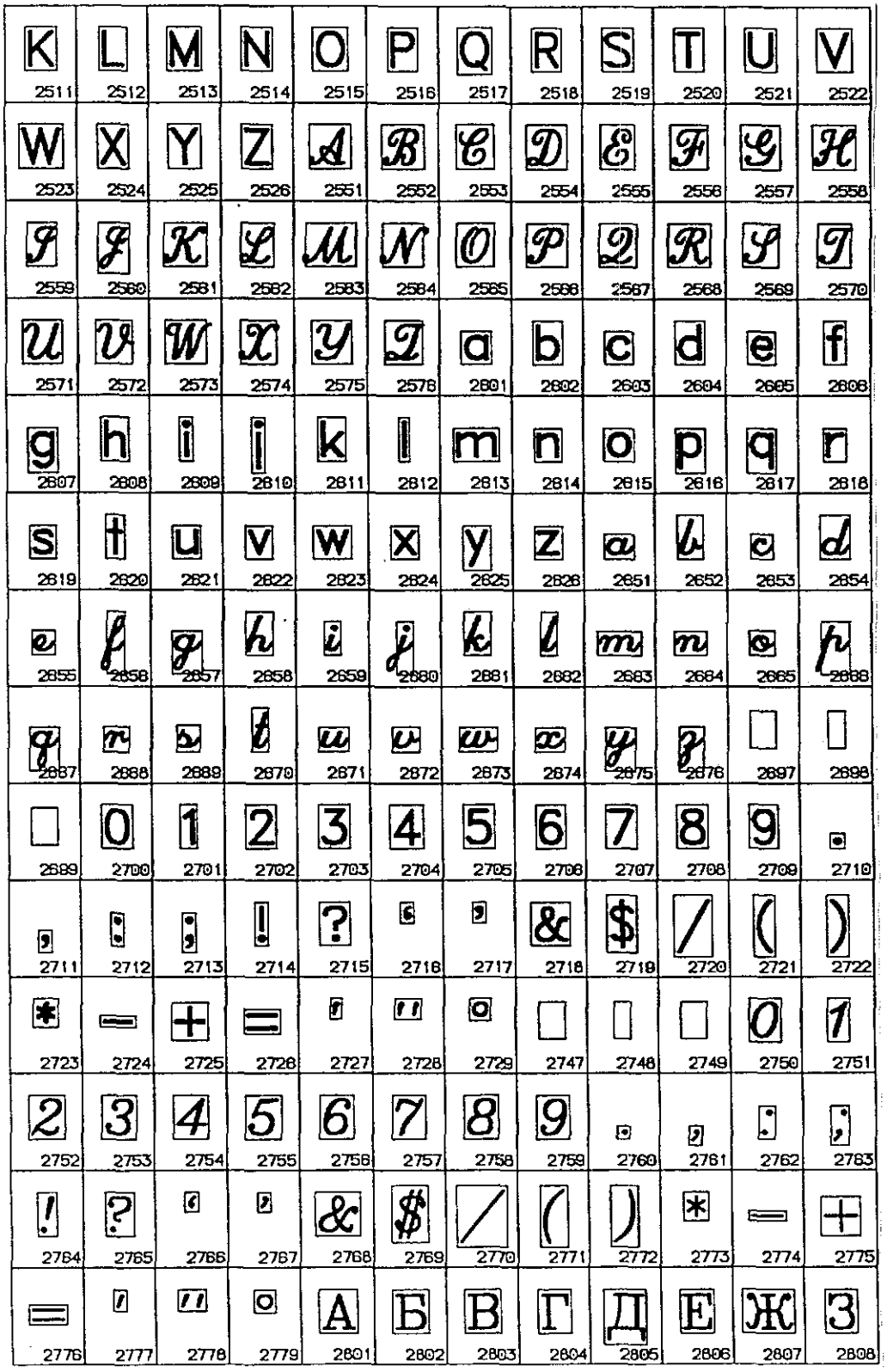
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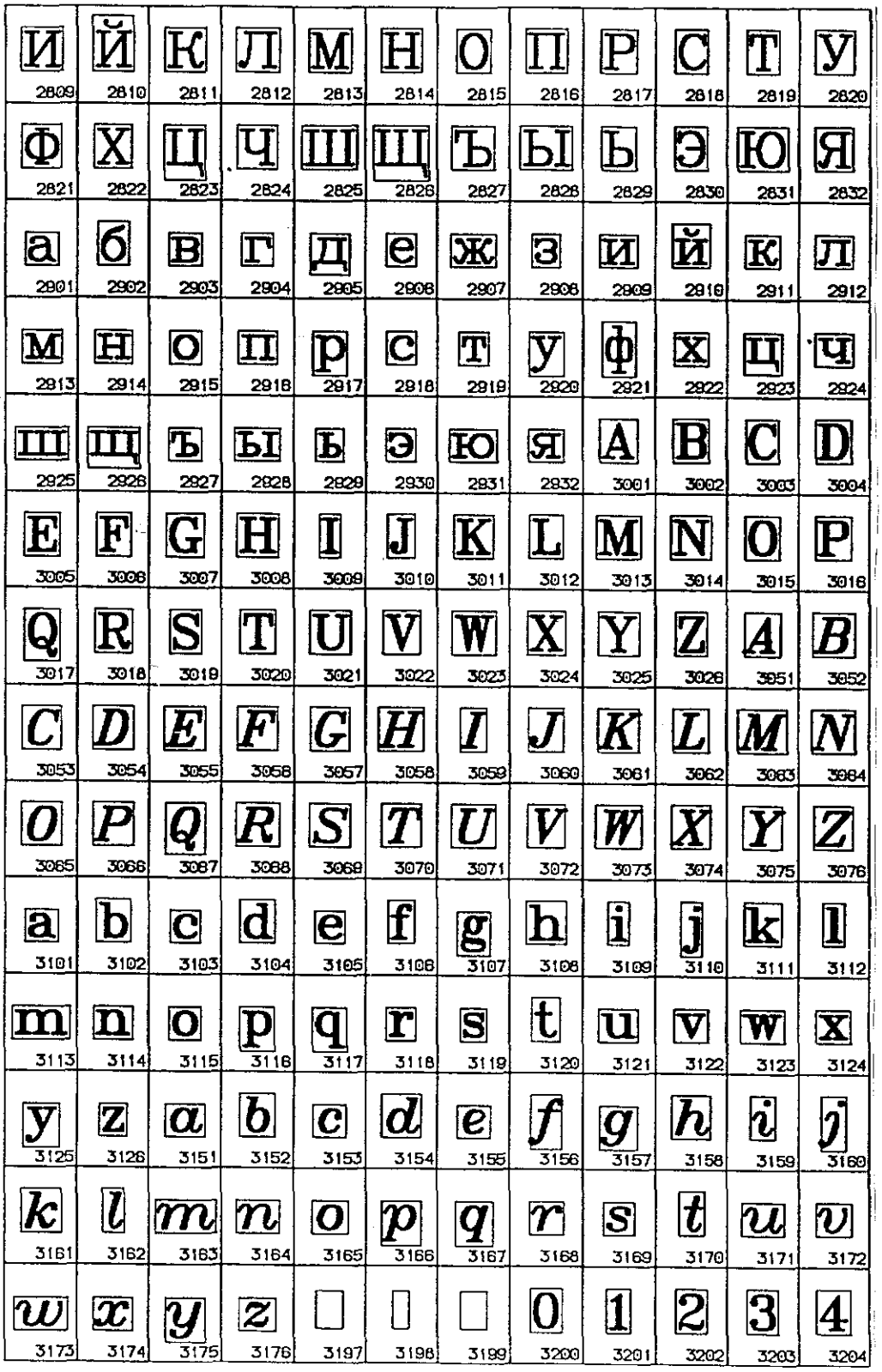
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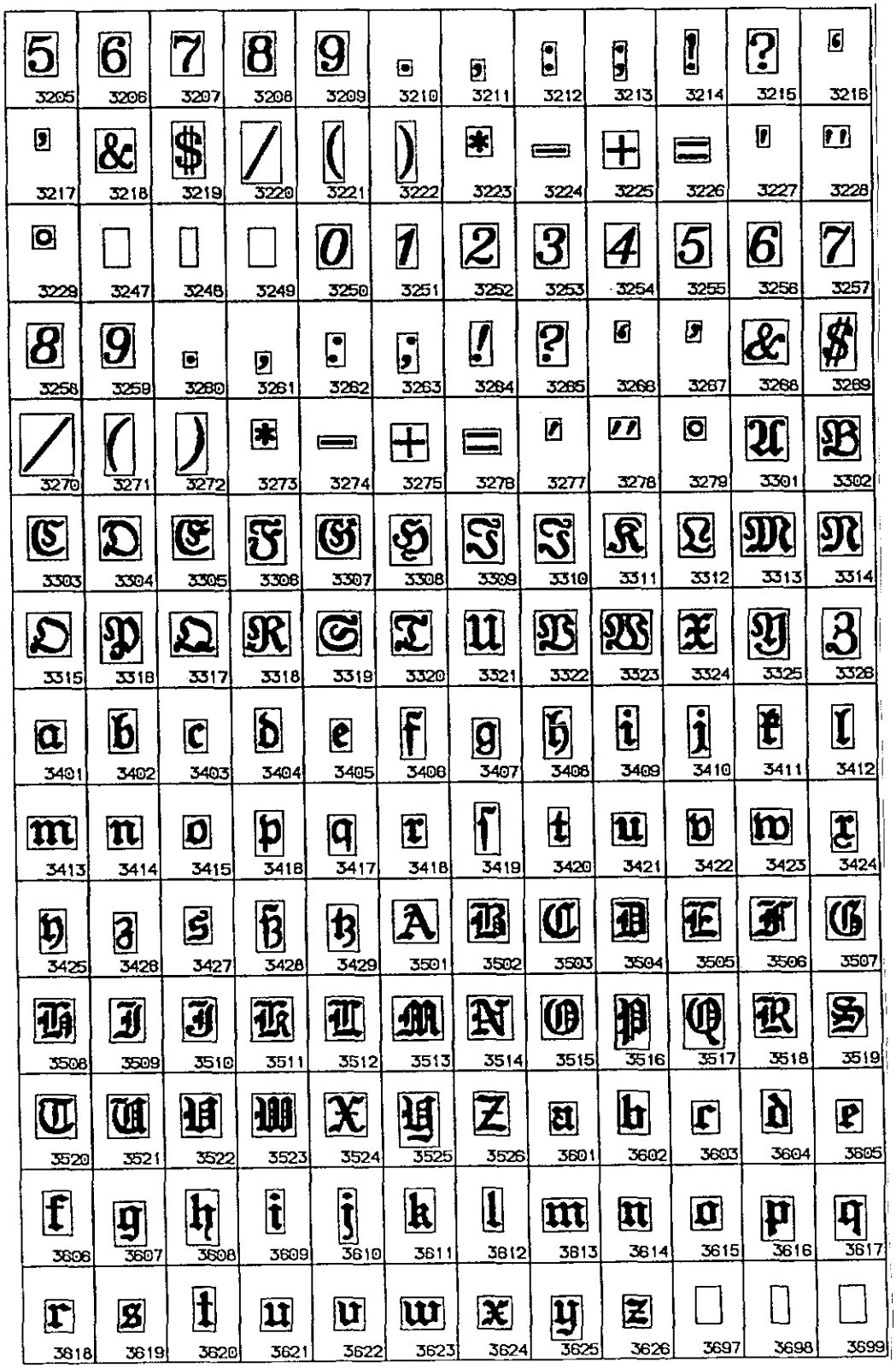
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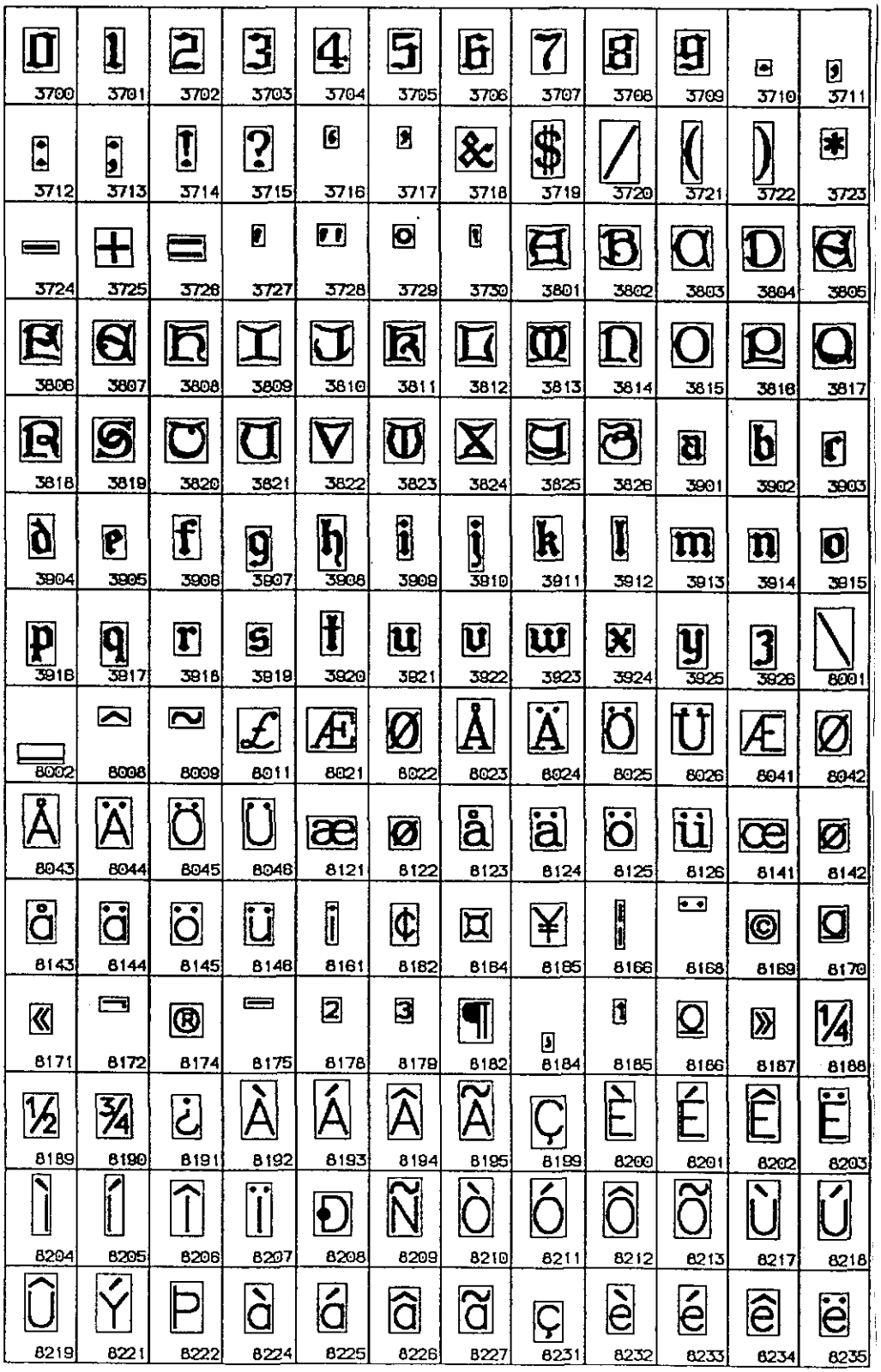
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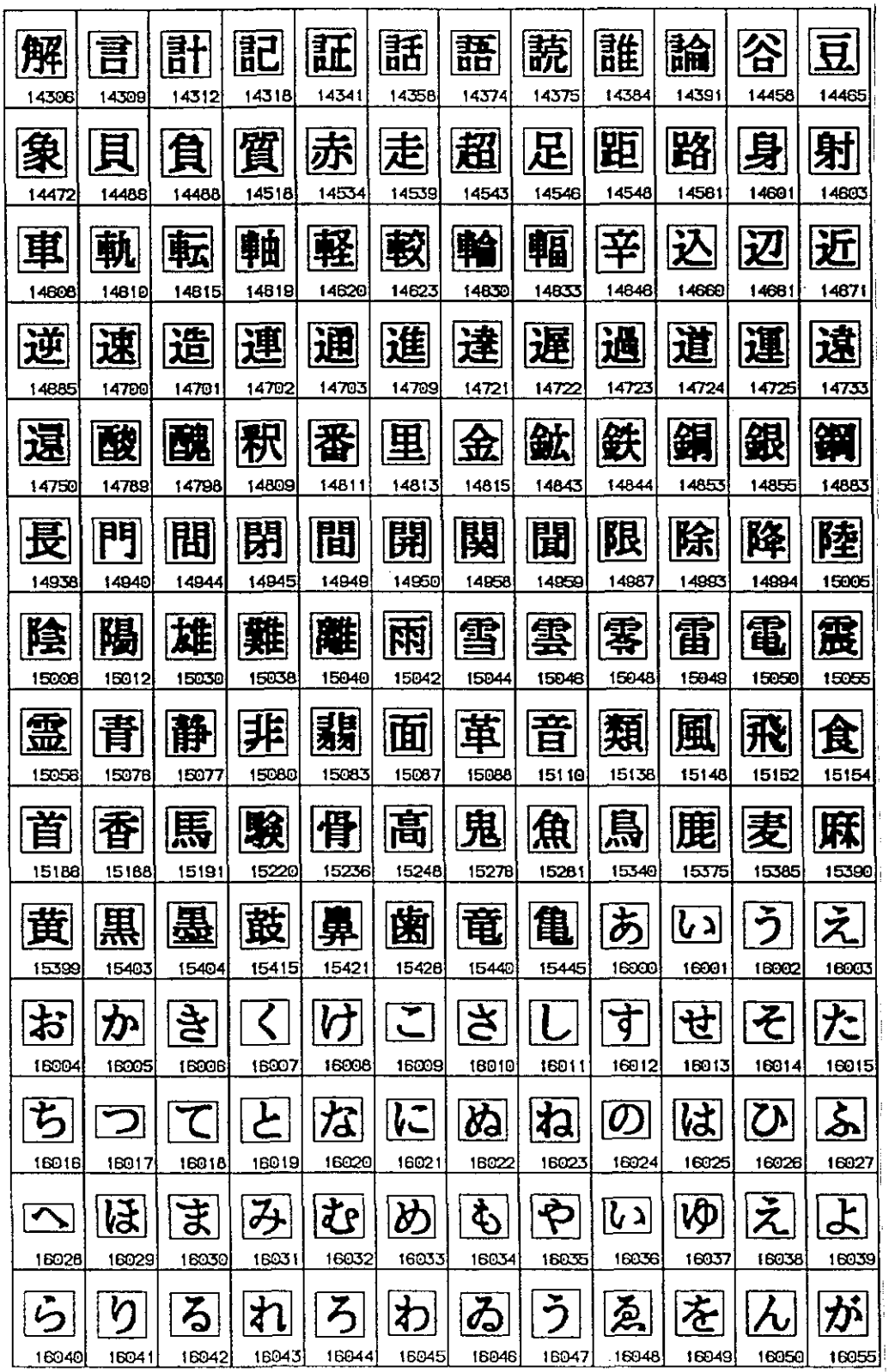
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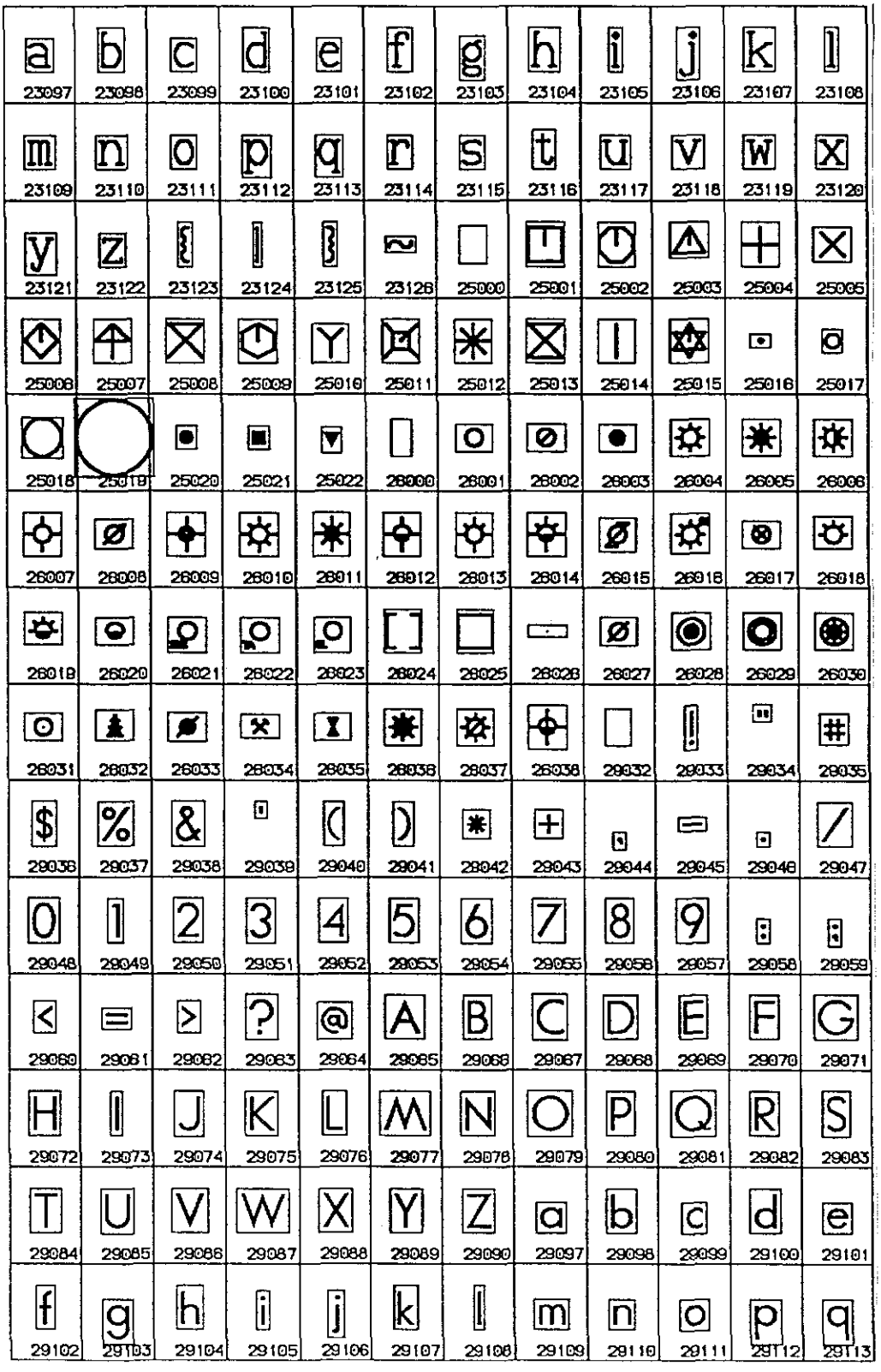
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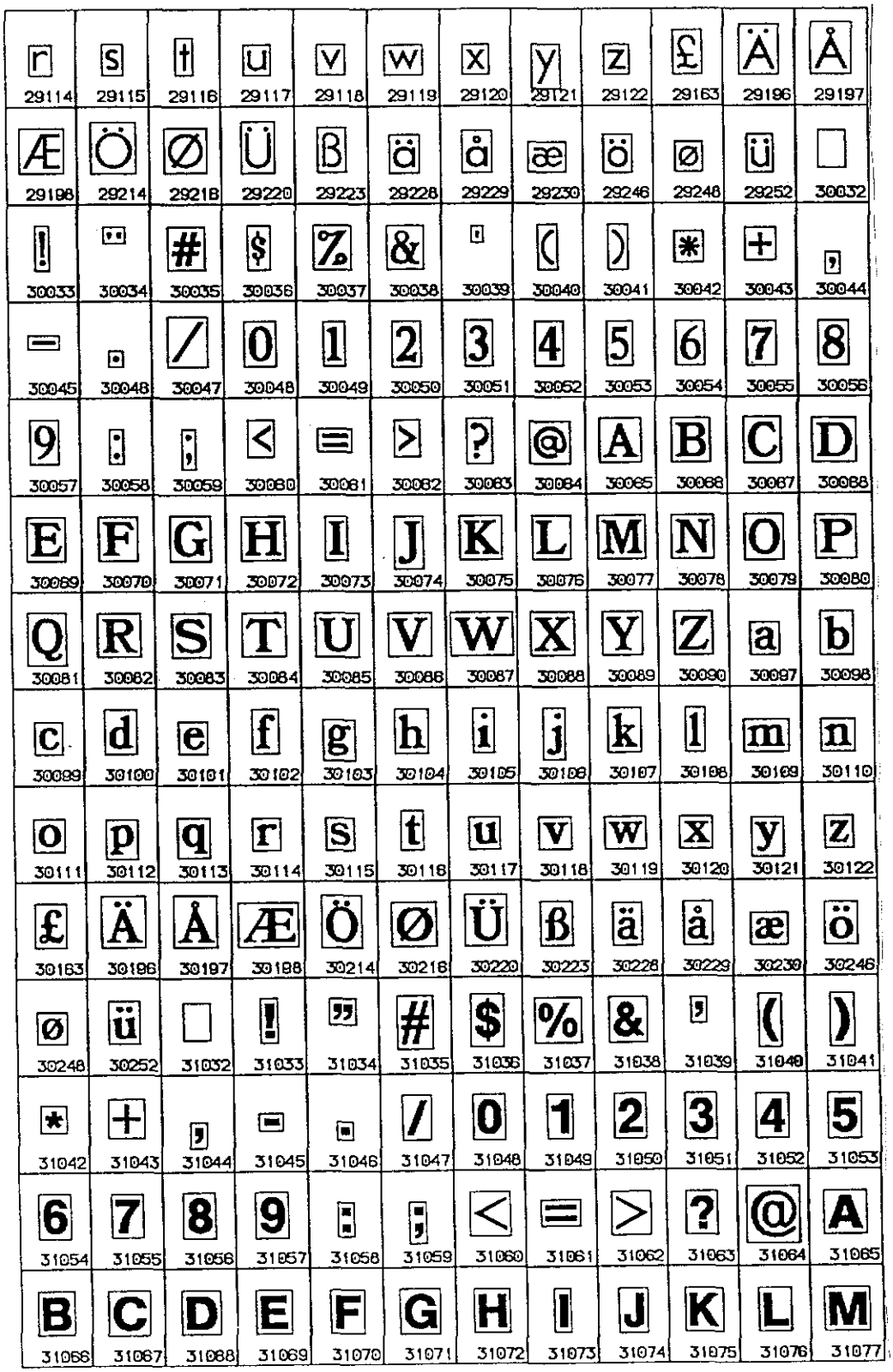
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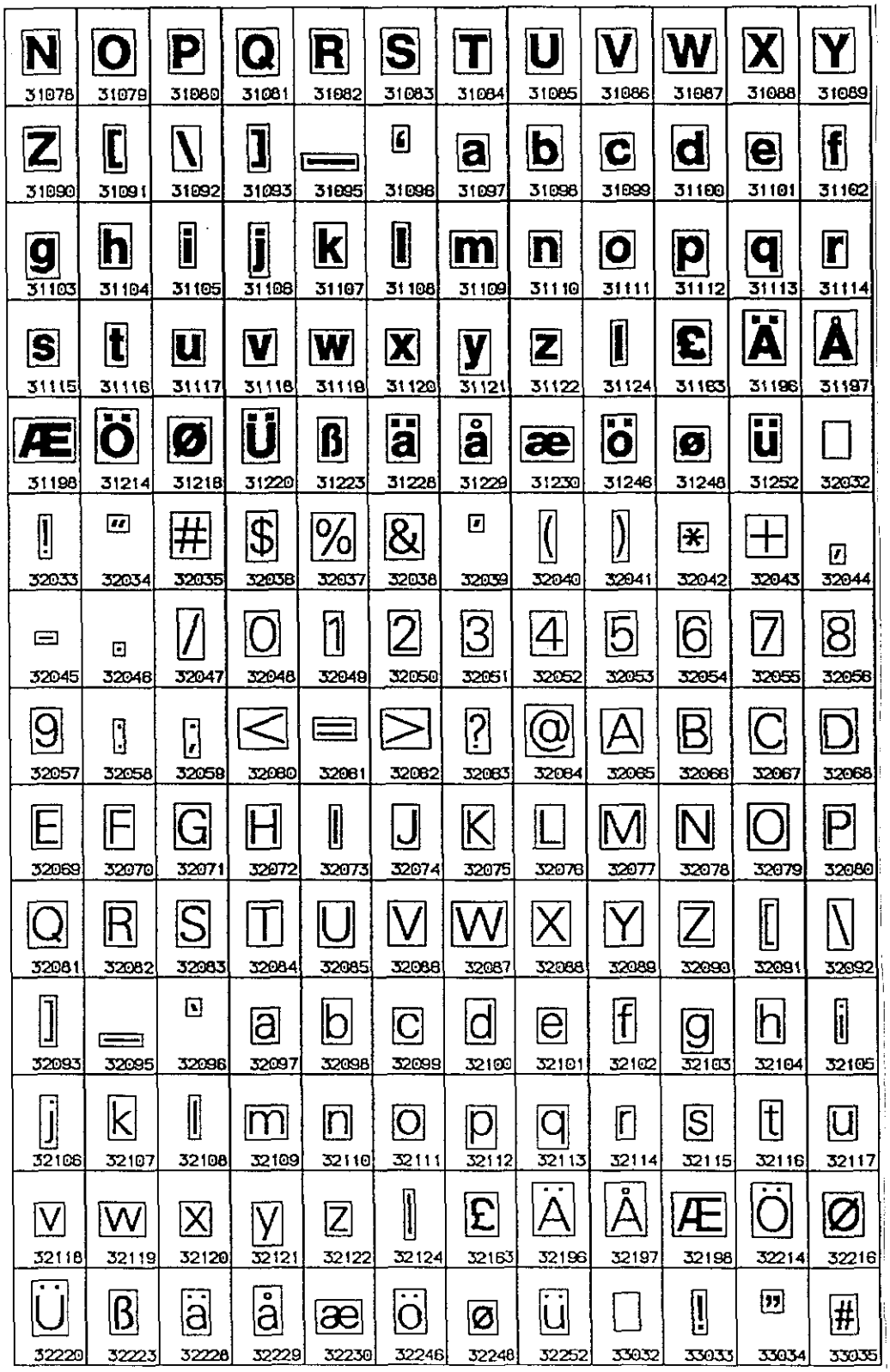
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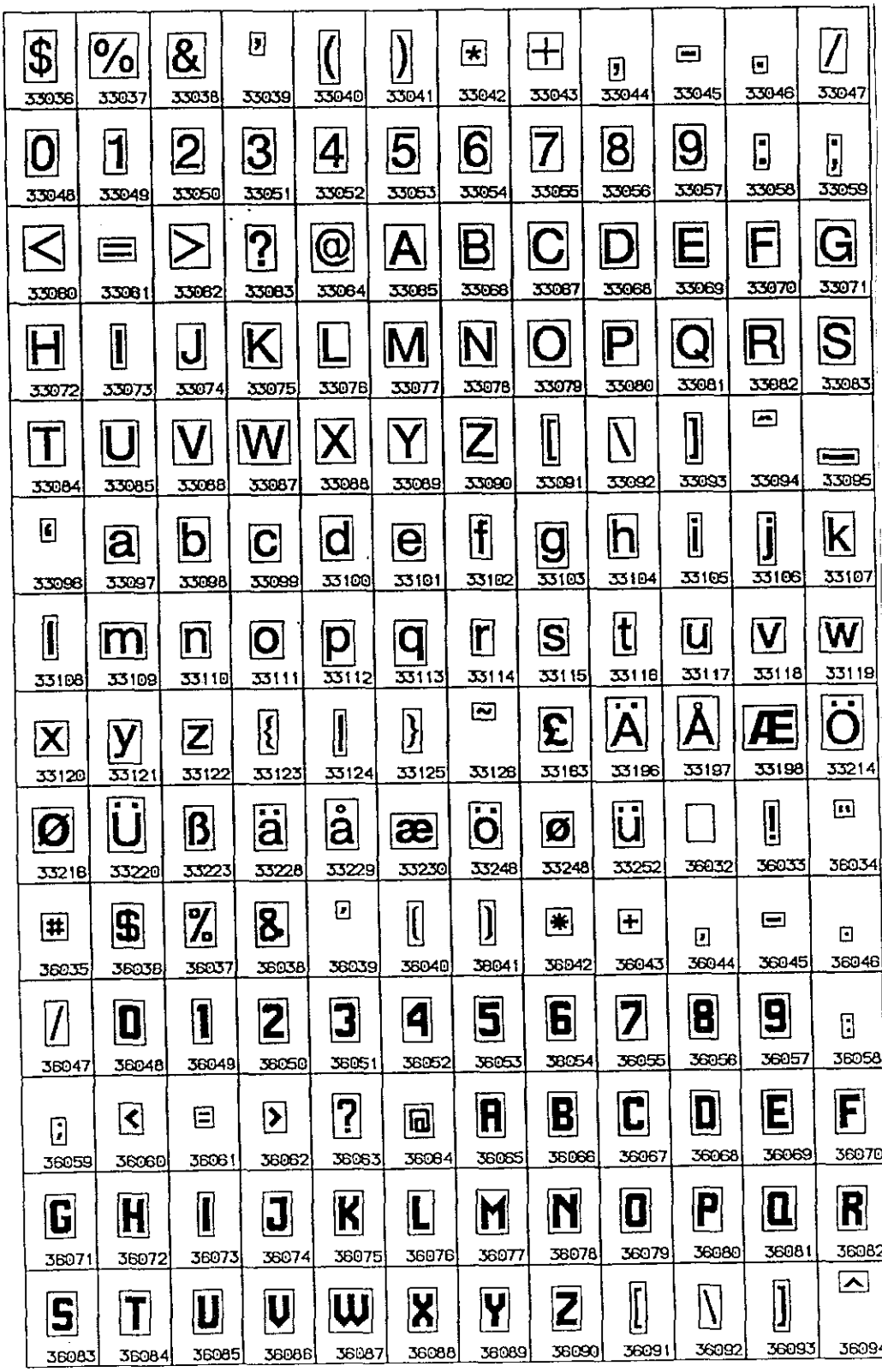
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36119	38120	38121	38122	38123	38124	38125	38126	38197	38198	36216	36229
36230	36248										

AII.4 Dgener8 Text

There are many occasions when the user will wish to supply text to be included in the display area or in the key. In most cases, the text will be supplied in the form in which it will appear, however, there may be times when the user wishes to exercise a higher level of control over this.

For example, if the user wishes to indicate that the area of the displayed catchment is 14.6 square kilometres, the annotation could read -

Catchment area = 14.6 square kilometres

Appearance is enhanced if the following is used -

Catchment area = 14.6 km^2

This can be achieved by using a text control character (TCC) within the text. The TCC's available in Dgener8 are -

#	=	the following character will be subscript
^	=	the following character will be superscript
[	=	the following Dgener8 marker index will be displayed
|	=	a line break will occur at this point

So, the text to achieve the example above would have been supplied to Dgener8 as -

Catchment area = 14.6km^2

To display a marker such as copyright symbol the user would supply the text -

[8169 Institute of Hydrology,1994.

The result would be

© Institute of Hydrology, 1994.

This is because the copyright symbol is Dgener8 special character number 8169. For a full list of the Dgener8 special characters, see AII.3 Dgener8 Point Markers.

Equally, if the user is supplying a key annotation and it is required that it should appear over two lines, the user can supply -

OS 1:50000 contours|(in 10cm units)

The result would be

OS 1:50000 contours
(in 10cm units)

AII.5 Dgener8 File Formats

Dgener8 is designed to access and display data that is held at The Institute of Hydrology but, there are occasions when there is a need to display data that has been supplied from outside The Institute or generated by another package. For this reason Dgener8 has the ability to read many recognised file formats (see command FILE).

ARCG - Arc/Info ungenerated ASCII readable polygons.
ARCL - Arc/Info ungenerated ASCII readable lines.
ARCP - Arc/Info ungenerated ASCII readable points.
NTF1 - National Transfer Format version 1.
NTF2 - National Transfer Format version 2.
ECU1 - ECU format

For the above formats, see their own official documentation.

DTMD - a format for specifying a number of points for catchment derivation (free format).

```
easting_1    northing_1    name_1
easting_2    northing_2    name_2
easting_3    northing_3    name_3
etc.
```

GAUG - a format for specifying a number of gauging stations to be displayed (free format).

```
gauge_1      name_1
gauge_2      name_2
gauge_3      name_3
etc.
```

If a name is not supplied, the stored name for this station will be retrieved and displayed if so required.

GAZR - a format for specifying a number of place names with category

```
category_1   easting_1    northing_1    place_1
category_2   easting_2    northing_2    place_2
category_3   easting_3    northing_3    place_3
etc.
```

LABS - a format for specifying a number of labels that are to appear in the display area (free format).

```
easting_1    northing_1    label_1
easting_2    northing_2    label_2
easting_3    northing_3    label_3
etc.
```

RGBC - a format for specifying red, green blue colour definitions (free format).

index_1	red_%_1	green_%_1	blue_%_1
index_2	red_%_2	green_%_2	blue_%_2
etc.			

Appendix III

Commands in Alphabetical Order

This appendix lists and describes in detail each Dgener8 command. A quick reference card is available and should sit in the back pocket of this manual.

The types of parameter are described as such

i - integer
r - real
c1 - single character
c2 - two character
c3 - three character
etc
s - string (one or more words)

The defaults for all parameters are displayed but, an entry of 'N/A' means that a default is not appropriate and a value must be supplied by the user.

There are some parameters that, if not supplied by the user, are calculated by Dgener8 based on the size of the display area and some sensible assumptions. Such parameters are indicated by an entry of 'Plot dependent'.

Command: *

Use: To precede all comments in a command file.

Parameters: comment (s)

Example: * Define required medium

Default: N/A

Notes: It is advisable to use comments to precede any line that may have a large number of parameters in order to briefly describe what will be produced. Regular users of Dgener8 will also use comments in headings for command files because once a number of command files are stored in a directory it becomes increasingly difficult to recall what each one was intended for.

Command: **AREA (1)**

Use: To define the display area of the required map. The area described is assumed to be in metres but this may not be the case if the user wishes to use only his/her data.

Parameters:		Default:
01)	coord_sys (i)	0
02)	easting_bottom_left (i)	429000
03)	northing_bottom_left (i)	70000
04)	easting_top_right (i)	466000
05)	northing_top_right (i)	100000

Example: AREA 0 354000 246000 365000 252000

Notes: 01) 0 = Great Britain
-1 = Northern Ireland

In more intricate applications it is sometimes necessary to define the display area more than once e.g if two small separate maps are to be produced on the same page. If this is the case it should be remembered that the borders will need changing otherwise one display area will overlay the other. In some cases a different scale may also be required.
See commands SCAL and SIZE.

Command: **AREA (2)**

Use: To define the display area of a map by using the extremes of a map sheet from an established series.

Parameters:		Default:
01)	map_series (c4)	N/A
02)	map_sheet_number (i)	N/A

Example: AREA LAND 146

Notes:
01) LAND = Ordnance Survey Landranger Series
02) Map sheet number from the desired series.

See commands SCAL and SIZE.

Command: **AREA (3)**

Use: To define the display area of a map by using the extremes of a NRFA gauging station catchment boundary or an hydrometric area boundary.

Parameters:		Default:
01)	boundary_type (c4)	N/A
02)	boundary_number (i)	N/A

Example: AREA CAT 39001

Notes:
01) CAT = Catchment boundary
HA = Hydrometric area boundary
02) Catchment boundary or hydrometric area boundary number

The physical area that this command describes is 10% larger than the bounding rectangle of the described boundary.

See commands SCAL and SIZE.

Command: **AREA (4)**

Use: To define the display area of a map by using the extremes of a region.

Parameters:		Default:
01)	region (c4)	N/A

Example: AREA GB

Notes: 01) GB = Great Britain
SCOT = Scotland
WALE = Wales
ENG = England
NI = Northern Ireland
REPI = Republic of Ireland
IREL = Ireland
IOW = Isle of Wight
IOM = Isle of Mann
ANGL = Anglesey

See commands SCAL and SIZE

Command: **BAND**

Use: To define the colours and band limits that describe the colours used when displaying raster data.

Parameters:		Default:
01)	colour_1 (i)	N/A
02)	limit_1 (r)	N/A
03)	colour_2 (i)	N/A
04)	limit_2 (r)	N/A
.		
.		
.		
nn)	colour_nn (i)	N/A

Example: BAND 2 100. 3 200. 4 300. 5 400. 6

Notes:
01) any Dgener8 colour index
02) limit in relation to data that is to be plotted
03) etc.

The limits MUST be in ascending order. The sequence of colour, limit, colour, limit, colour etc. MUST start and finish with a colour.

Command: **BORD**

Use: To define the borders that are to be used around the display area. This allows an amount of white area to surround the display area and may be used for axes labels or further annotations. This command also indicates whether or not a key is required.

Parameters:		Default:
01)	left_hand_border (r)	20.
02)	bottom_border (r)	10.
03)	right_hand_border (r)	20.
04)	top_border (r)	10.
05)	key_width (r)	100.
06)	key_on_left_or_right (c1)	R

Example: BORD 10. 10. 10. 10. 100. R

Notes:
01) millimetres
02) as 01
03) as 01
04) as 01
05) as 01. This defines the width of the required key. Set to 0.0 if no key is required. IN VERSION 1 OF DGENER8, THIS IS FIXED TO 100mm.
06) L = key will be positioned to the left of the display area
R = key will be positioned to the right of the display area

There are occasions when two or more separate display areas will be required on one page. In this case it is possible to define the borders more than once in a given command file. Borders should be defined whenever a new display area is required and it is good practise to define them shortly after calls to AREA and SCAL.
The usual location for a key is to the right of the display area.

Command: **BOXX**

Use: To define a rectangle in the display area. This rectangle can be wire frame or be with solid infill.

Parameters:		Default:
01)	easting_bottom_left (i)	0
02)	northing_bottom_left (i)	0
03)	easting_top_right (i)	700000
04)	northing_top_right (i)	1000000
05)	outline_colour (i)	10
06)	outline_width (r)	0.1
07)	outline_style (i)	0
08)	infill_colour (i)	-1
09)	infill_pattern (i)	-1

Example: BOXX 258000 264000 261000 266000 6 2.0 0 5 0

Notes:
01) in display area coordinates
02) as 01
03) as 01
04) as 01
05) any Dgener8 colour index
06) millimetres
07) any Dgener8 line style
08) as 05 (-1 for no infill)
09) not supported, solid infill only

This facility can be used to highlight an area of interest or, by blanking out an area, to supply a clear background over which text can be written.

Command: **CATS**

Use: To display catchment boundaries labelled with number and/or name.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	station_number_1 OR easting (i)	N/A
03)	station_number_2 OR northing (i)	N/A
04)	colour (i)	4
05)	width (r)	0.1
06)	style (i)	0
07)	infill_colour (i)	-1
08)	infill_pattern (i)	-1
09)	outfill_colour (i)	-1
10)	outfill_style (i)	-1
11)	label_size (r)	2.0
12)	label_colour (i)	1
13)	label_position (i)	3
14)	display_name (i)	1
15)	name (s)	N/A

Example: CATS GAUG 54001 54999 4 0.2 0 -1 -1 -1 -1 3.0 3 3 3

Notes:

01) GAUG = Gauging Stations
DTMD = IHDTM derived catchments
FILE = Catchments held in a user defined file which will be defined on the subsequent line in the command file (for more information on this see command FILE). This file can also contain either a list of gauging station numbers and names or a list of eastings,northings and names. This is indicated by the file format.

02) if the data type is GAUG, this represents the first gauging station in a range and 03 represents the last station in the range. For one station, 02 and 03 should be the same. If the data type is DTMD, this represents the easting of the catchment that is to be derived and 03 represents the northing. If the data type FILE is used, 02 and 03 are ignored.

03) see 02

04) any Dgener8 colour index

05) millimetres

06) any Dgener8 line style

07) as 04

08) not supported, solid infill only

09) as 07

10) as 08

11) millimetres

12) as 04

13) offset from the catchment outlet that label is to be displayed - if it is assumed that the outlet is at position 5, the following diagram displays where the label will be placed

7	8	9
4	5	6
1	2	3

therefore, a value of 3 will position the start of the label below and to the right of the outlet.

■
39001 The Thames at Kingston

14) 0 = no number/grid reference or name
1 = just number/grid reference
2 = just name
3 = number/grid reference and name

15) if this is not blank this will be displayed as the point annotation - this is likely to be used when requesting just one station

Command: **CCMY**

Use: To switch to the Cyan-Magenta-Yellow-Black (CMYK) scheme.

Parameters:		Default:
	None	N/A

Example: CCMY

Notes: The CMYK scheme is based on Cyan, Magenta and Yellow and all other colours are constructed from these three. The quantity of each component is expressed as a percentage so to obtain cyan, the proportions would be 100., 0., 0.. Many books are devoted to the mixing of colours using CMYK so to explain it in full will not be attempted here.

Command: **CFIL**

Use: To assign a number of Dgener8 colour indices colours.

Parameters:

		Default:
01)	file_name (c*)	N/A

Example: CFIL /users/dtm/rwf/Dgener8_new_colours.rgb

Notes: 01) Indices and colour components are held in a user defined file.

This file is free format with the entries -

index_1 component_1 component_2 component_3
index_2 component_1 component_2 component_3
etc.

This provides a quick way to redefine a number of colours that may have been supplied in the form of a palette with a data file (for example Ordnance Survey raster maps).

Command: **CHLS**

Use: To switch to the Hue-Lightness_Saturation (HLS) scheme (Dgener8 default).

Parameters:		Default:
	None	N/A

Example: CHLS

Notes: The HLS scheme is based on hue, lightness and saturation where hue is a continuous circular band with blue at 0, magenta is 60, red is 120, 180 is yellow, 240 is green and cyan is 300. The transition from one to the other is smooth. Lightness is a percentage and it is the amount of imaginary light that is falling on the hue. 0 will always result in black and 100 will always result in white. A value of 50 will show the true hue. Saturation is the 'amount' of the hue that is used. 0 will always give white which will be controlled by the amount of 'lightness' that is falling on it. A value of 100 best represents the hue.
The tip when becoming familiar with HLS is to select your hue and first view it with 50 percent lightness and 100 percent saturation. This provides a good starting point before experimenting with lightness and saturation.

Command: **CIND**

Use: To assign a single user defined colour to the Dgener8 colour index.

Parameters:		Default:
01)	index (i)	N/A
02)	component_1 (i)	N/A
03)	component_2 (i)	N/A
04)	component_3 (i)	N/A

Example: CIND 33 30 50 100

Notes:

01) a number between 0 and 256 though it is advisable to leave 0 to 29 as the standard Dgener8 set.

02) if in HLS colour scheme, hue is specified (0 - 360).
if in RGB colour scheme, red component is specified (0 - 100)
if in CMY colour scheme, cyan component is specified (0 - 100)

03) if in HLS colour scheme, lightness is specified (0 - 100).
if in RGB colour scheme, blue component is specified (0 - 100)
if in CMY colour scheme, magenta component is specified (0 - 100)

04) if in HLS colour scheme, saturation is specified (0 - 100).
if in RGB colour scheme, green component is specified (0 - 100)
if in CMY colour scheme, yellow component is specified (0 - 100)

For a full definition of the three colour schemes see the commands CCMY, CHLS, CRGB and the Dgener8 Colour Index.

Command: **CRAN**

Use: To assign a smooth range of colours across a specified number of colour indices. ONLY AVAILABLE IN HLS SCHEME.

Parameters:		Default:
01)	start_index (i)	N/A
02)	finish_index (i)	N/A
03)	start_hue (i)	N/A
04)	start_lightness (i)	N/A
05)	start_saturation (i)	N/A
06)	finish_hue (i)	N/A
07)	finish_lightness (i)	N/A
08)	finish_saturation (i)	N/A

Example: CRAN 41 52 180 40 100 220 60 100

Notes:

01) a number between 0 and 256 though it is advisable to leave 0 to 29 as the standard Dgener8 set.
02) a number greater than that specified in 01 and less than 256.
03) hue is based on a circle of 360 degrees where 0 is blue, 60 is magenta, 120 is red, 180 is yellow, 240 is green and 300 is cyan. The transition through each quarter is a gradual change.
04) lightness is a percentage where 0 will always result in black and 100 will always result in white. A useful starting point is 50 and subtle variations can be achieved by altering this figure.
05) saturation is a percentage controlling the intensity of the hue that has been selected. 0 will mean that the resulting colour will be a shade of grey that is dependent on the lightness value. 100 will give the true hue. It is best to use 100 until the user is familiar with the CMYK scheme.
06) as 03. A value greater than 03 will result in a clockwise journey through the hue. A value less than 03 will result in an anticlockwise journey through hue.
07) as 04
08) as 05

This command is powerful in that the user can define a start and finish colour e.g green and brown and specify the number of indices between these to obtain and equally spaced colour scale. This is of special use when defining bands for raster data such as digital elevation.

Some useful hls colours are -

red 120. 50. 100.
blue 0. 50. 100.
green 240. 50. 100.
cyan 300. 50. 100.
magenta 60. 50. 100.
yellow 180. 50. 100.

Command: **CRGB**

Use: To switch to the Red-Green-Blue (RGB) scheme.

Parameters:	Default:
None	N/A

Example: CRGB

Notes: RGB operates on the additive method whereby saturation of red, green, blue gives black and zero levels give white.

Command: **CRNM**

Use: To assign a smooth range of colours across a specified number of colour indices using named colours. ONLY AVAILABLE IN HLS SCHEME.

Parameters:		Default:
01)	start_index (i)	N/A
02)	finish_index (i)	N/A
03)	start_colour (c)	N/A
04)	finish_colour (c)	N/A

Example: CRNM 41 52 red green

Notes:

01) a number between 0 and 256 though it is advisable to leave 0 to 29 as the standard Dgener8 set.
02) a number greater than that specified in 01 and less than 256.
03) any X colour - the list of X colours is extensive and can be viewed on your workstation - for more information on this, approach the Help Desk.
04) as 03

This command is powerful in that the user can define a start and finish colour e.g green and brown and specify the number of indices between these to obtain and equally spaced colour scale. This is of special use when defining bands for raster data such as digital elevation.

Command: **DEVI**

Use: To specify the required output medium. This should be the first command in all Dgener8 command files.

Parameters:		Default:
01)	output_medium (c4)	SCRN
02)	paper_x_dimension (r)	290.
03)	paper_y_dimension (r)	210.
04)	rotate (c1)	N
05)	paper_colour (c)	white

Example: DEVI POST 205. 285. N

Notes:

01) SCRN = workstation screen
POST = postscript file (NOTE: Default paper rotation for POST is Y)
02) millimetres
03) as 02
04) N = do not rotate paper
Y = rotate paper
05) Any X colour

If the intended hardcopy device is an A4 Portrait device and the required map is A4 landscape the paper size would be described as A4 portrait and the rotate facility used. For exact details of hardcopy device orientation see the Help Desk. As a rough rule, A4 printers are portrait and A3 are landscape.
If your intended map is larger than the described paper size, Dgener8 will issue a warning. The user should then consider enlarging the paper dimensions or reducing the scale.
The paper colour command fills the whole paper with the specified colour and can be useful when requiring tints.

Command: **DFBS**

Use: To change background settings in Dgener8. For example, the colour of text used in the key is black but, it can be changed, as can all parameters within Dgener8. In most cases these parameters are altered by the parameters supplied with other commands, however, for parameters that are rarely likely to be changed, DFBS must be used.

Parameters:		Default:
01)	default_identifier (c4)	N/A
02)	new_value (dependent on default_identifier)	N/A

Example: No example

Notes: IN DGENER8 VERSION 1, DFBS IS UNAVAILABLE. A FULL LISTING OF IDENTIFIERS WILL BE SUPPLIED WITH VERSION 2.

Command: **DFCP**

Use: To define default settings for Dgener8 commands.

Parameters:			Default:
	01)	Dgener8 command (c4)	N/A
	02)	1st parameter for above command	N/A
	.		
	.		
	.		
	nn)	nth parameter for above command	N/A

Example: DFCP DRAI IHCH 5 0.2 0 etc.

Notes: The command DFCP only appears in Dgener8 default files i.e Dgener8.defaults. For a full explanation of this, see the User Guide and Manual.

Command: **DRAI**

Use: To specify the required data type and style of a drainage network to appear in the display area.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	colour_of_network (i)	5
03)	width_of_network (r)	0.1
04)	style_of_network (i)	0
05)	colour_of_direction_arrow (i)	-1
06)	size_of_direction_arrow (r)	0.0
07)	third_dimension_colour_change (i)	-1
08)	third_dimension_width_change (r)	0.1
09)	third_dimension_style_change (i)	0
10)	colour_of_downstream_marker (i)	-1
11)	size_of_downstream_marker (r)	0.0
12)	colour_of_upstream_marker (i)	-1
13)	size_of_upstream_marker (r)	0.0
14)	colour_of_mouth_marker (i)	-1
15)	size_of_mouth_marker (r)	0.0
16)	colour_of_mouth_stretch (i)	-1
17)	width_of_mouth_stretch (r)	0.0
18)	style_of_mouth_stretch (i)	0
19)	colour_of_source_marker (i)	-1
20)	size_of_source_marker (r)	0.0
21)	colour_of_source_stretch (i)	-1
22)	width_of_source_stretch (r)	0.0
23)	style_of_source_stretch (i)	0

Example: DRAI IHCH 5 1.0

Notes:

01)
- IHCH = IH 1:50000 digitised drainage channels. This includes rivers and canals etc.
- IHRV = IH 1:50000 digitised rivers
- IHCN = IH 1:50000 digitised canals
- IHSP = IH 1:50000 surface pipes (canalised drainage)
- R250 = Ordnance Survey 1:250000 rivers (only samples available)
- C250 = Ordnance Survey 1:250000 canals (only samples available)
- FILE = Network held in a user defined file which will be defined on the subsequent line in the command file (for more information on this see command FILE)

02) any Dgener8 colour index
03) millimetres
04) any Dgener8 line style
05) as 02, -1 to switch off
06) as 03
07) as 02, -1 to switch off
08) as 03
09) as 04

10) as 02, -1 to switch off
11) as 03
12) as 02, -1 to switch off
13) as 03
14) as 02, -1 to switch off
15) as 03
16) as 02, -1 to switch off
17) as 03
18) as 04
19) as 02, -1 to switch off
20) as 03
21) as 02, -1 to switch off
22) as 03
23) as 04

The many facilities available in this command are designed for the validation of networks. The arrow facility will indicate the direction of flow. The stretch end markers put a bullet of the specified size and colour at either the upstream and/or downstream end. This is an alternative to the arrow indicator. The third dimension facilities will show stretches of the network in an alternative colour if and when the height is not set along the given stretch. The mouth markers will highlight any unmatched downstream node and, if required, highlight the complete stretch. The source markers operate in a similar way, highlighting any unmatched upstream nodes.
NOTE: IN MOST APPLICATIONS, ONLY THE FIRST FOUR PARAMETERS WILL BE USED. THE REST CAN BE IGNORED.

Command: **DRIP**

Use: To display The Institute of Hydrology logo at a specified position.

Parameters:		Default:
01)	easting (i)	N/A
02)	northing (i)	N/A
03)	size (i)	1000
04)	colour_of_drip (i)	25
05)	colour_of_letters (i)	20

Example: DRIP 305500 402000 1000 5 0

Notes:
01) in display area coordinates
02) as 01
03) in display area units
04) any Dgener8 colour index
05) as 04

If infill of drip or letters is not required, the colours can be supplied as negative values. This results in a wire-frame drip which is less aesthetically pleasing.

The easting and northing specify the centre of the drip. The ratio of the height to width of the drip is 1:0.624.

Command: **DTMO**

Use: To display the IHDTM outflow directions in vector form.

Parameters:

		Default:
01)	colour_of_outflow_directions (i)	2
02)	width_of_outflow_directions (r)	0.1
03)	style_of_outflow_directions (i)	0

Example: DTMO 4 0.2 0

Notes:
01) any Dgener8 colour index
02) millimetres
03) any Dgener8 line style

At scales greater than 1:50000, this facility becomes limited.

Command: **DTMP**

Use: To display the route taken to the sea from any supplied point. This application uses the IHDTM flow direction dataset.

Parameters:		Default:
01)	easting_of_point (i)	N/A
02)	northing_of_point (i)	N/A
03)	colour_of_flow_path (i)	2
04)	width_of_flow_path (r)	0.1
05)	style_of_flow_path (i)	0

Example: DTMP 246750 342550 3 0.1 0

Notes:
01) display area units
02) as 02
03) any Dgener8 colour index
04) millimetres
05) any Dgener8 line style

The flow path continues until sea is reached or it travels outside of the display area.

Command: **DTMW**

Use: To display the flow directions and also the width of the channel as a function of its catchment area. As a result, channel widths become wider in the downstream direction. Thresholds can also be supplied to limit the extent of the network displayed.

Parameters:

		Default:
01)	method_of_depiction (i)	2
02)	threshold (r)	0.5
03)	colour_of_channel (i)	5
04)	width_at_threshold (r)	0.1
05)	width_benchmark (r)	500.
06)	catchment_size_benchmark (r)	4.0

Example: DTMW 2 0.5 5 0.1 1.0 500.

Notes:

01) 1 = depict drainage channel at same width regardless of catchment area at each point (this produces identical output to DTMO but with control over the density of the network).
2 = use benchmarks 05 and 06 to calculate width at which channel should be displayed. When channel first appears it will be displayed at width width_at_threshold and become wider as described by 05 and 06 (see descriptions of these)
3 = As above but with less computation and less rigorous smoothing of river curves. This can be used on scales smaller than 1:100000 as the degradation is invisible yet processing is reduced as is the size of the PostScript file.

02) minimum size of catchment flowing through a point before channel is displayed i.e if you only wanted channel to appear where more than half a square kilometre of land drains through a point, this value would be set to 0.5. As a very rough guide, blue lines begin to appear on Ordnance Survey 1:50000 maps at approximately one third of square kilometre but of course, many factors affect this.

03) any Dgener8 colour index

04) millimetres (channels will first appear at this width, i.e channels with catchment area of 03)

05) this supplies a parameter for the equation that controls the rate at which the channel width increases. It is an indicator that shows the width required further downstream at a supplied catchment size, parameter 07. Therefore, if the largest catchment appearing in the display area is approximately two thousand kilometres, the user can specify the width of this by giving width_benchmark a value of 2000. and 07 a value of the required width.

06) millimetres (for explanation see 06)

The equation used to calculate the width at a given point is as follows -

ca = catchment area at given point

widfac = width_benchmark / SQRT(catchment_size_benchmark)

width = SQRT(ca) x widfac

width = MAX(width,width_at_threshold)

This routine is a very powerful tool to produce networks of infinitely variable density e.g only major rivers shown on a 1:1000000 scale map of Great Britain.

Command: **EDCC**

Use: To define the required ticks and labelling on specific axes of the displayed map.

Parameters:

		Default:
01)	colour_of_ticks_and_labels (i)	10
02)	size_of_labels (r)	2.0
03)	multiplying_factor_for_labels (r)	1.0
04)	multiple_for_primary_tick_and_label (i)	Plot dependent
05)	size_of_primary_tick (r)	1.5
06)	multiple_for_secondary_tick (i)	Plot dependent
07)	size_of_secondary_tick (r)	1.0
08)	multiple_of_tertiary_tick (i)	Plot dependent
09)	size_of_tertiary_tick (r)	0.5
10)	annotate_left_axis (i)	1
11)	annotate_bottom_axis (i)	1
12)	annotate_right_axis (i)	1
13)	annotate_top_axis (i)	1

Example: EDCC 3 2.0 0.01 1000 2.0 500 1.0 100 0.5 1 1 0 0

Notes:

01) Any Dgener8 colour index
02) millimetres
03) when dealing with a display area in metres it is sometimes required or considered neater to label the axes in kilometres - in this case the multiplying_factor_for_labels would be 0.001. However, any factor can be chosen according to user requirements.
04) the multiple on which the label will appear. If EDCC is not called, Dgener8 will select a multiple with the aim that annotations appear approximately every 2cm. The actual spacing is governed by the nearest 'sensible' multiple.
05) millimetres
06) as 04
07) as 05
08) as 04
09) as 05
10) 0 = do not annotate
    1 = annotate
11) as 10
12) as 10
13) as 10

It is possible produce axes annotations in different colours by issuing the EDCC command more than once with different axes switched on and off.

NOTE: Annotations can be turned-off by the command -

EDCC OFF

This becomes the default if the border areas surrounding the display area are too small to contain the annotations (See BORD).

Command: **FILE**

Use: To specify a file name that contains data to be displayed.

Parameters:		Default:
01)	format_of_file (c4)	N/A
02)	file_name (c*)	N/A

Example: FILE ARCL /users/dtm/rwf/data/hydro.area

Notes:

01)

ARCL =	Arc/Info line format
ARCP =	Arc/Info point format
ARCR =	Arc/Info raster format
ECUL =	ECU format
NTF1 =	National Transfer Format version 1
NTF2 =	National Transfer Format version 2
COLS =	Dgener8 colour definitions
LABS =	Dgener8 labels format
GAUG =	Dgener8 gauging station numbers
DTMD =	Dgener8 catchment outlet grid references

02) Either relative or full path name (do not use special characters)

Specifications for the Dgener8 specific formats are contained in this manual and are designed to be as simple as possible. For specifications of the other formats see relevant publications.

Command: **FRAM**

Use: To specify the design of the frame that surrounds the total area of the map.

Parameters:

		Default:
01)	colour_1 (i)	10
02)	width_1 (r)	1.5
03)	style_1 (i)	0
04)	inset_from_left_1 (r)	0.75
05)	inset_from_bottom_1 (r)	0.75
06)	inset_from_right_1 (r)	0.75
07)	inset_from_top_1 (r)	0.75
08)	colour_2 (i)	10
09)	width_2 (r)	1.0
10)	style_2 (i)	0
11)	inset_from_left_2 (r)	2.50
12)	inset_from_bottom_2 (r)	2.50
13)	inset_from_right_2 (r)	2.50
14)	inset_from_top_2 (r)	2.50

Example: FRAM 10 2.0 0 5. 10. 5. 10. 10 1.0 0 7. 12. 7. 12.

Notes:

01) any Dgener8 colour index
02) millimetres
03) any Dgener8 line style
04) distance in millimetres from the left hand edge of the map area
05) distance in millimetres from the bottom edge of the map area
06) distance in millimetres from the right hand edge of the map area
07) distance in millimetres from the top edge of the map area
08) any Dgener8 colour index
09) millimetres
10) any Dgener8 line style
11) distance in millimetres from the left hand edge of the map area
12) distance in millimetres from the bottom edge of the map area
13) distance in millimetres from the right hand edge of the map area
14) distance in millimetres from the top edge of the map area

In most cases 04 and 06 will have the same value as will 05 and 07. However, this command is designed with maximum flexibility in mind. The default is for a 'double' frame. See examples in the User Manual.
FRAM can be specified at any point in the control file but, it is plotted prior to any data.

NOTE: Frames can be turned-off by the command -

FRAM OFF

Command: **GAZR**

Use: To display place names from a specified gazeteer in the display area.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	maximum_category (i)	10
03)	size_of_category_1_text (r)	7.0
04)	size_of_category_2_text (r)	6.0
05)	size_of_category_3_text (r)	5.0
06)	size_of_category_4_text (r)	3.0
07)	size_of_category_5_text (r)	2.5
08)	size_of_category_6_text (r)	2.2
09)	size_of_category_7_text (r)	2.0
10)	size_of_category_8_text (r)	2.0
11)	size_of_category_9_text (r)	2.0
12)	size_of_category_10_text (r)	2.0

Example: GAZR AADE 3 6.0 5.0 4.0 3.0 2.0 2.0 2.0 2.0 2.0 2.0

Notes:

01) AADE = AA Developments gazeteer. This gazeteer contains 30,000 place names ranging from London (category 1) to Winterbrook, near Wallingford (category 7)

02) Maximum category to be displayed. For a 1:50000 scale map, up to category 7 is acceptable however, as the scale drops the categories displayed need to be reduced. At 1:250000 categories 1 - 4 may be enough.

03) millimetres

04) as 03.

05) as 03.

06) as 03.

07) as 03.

08) as 03.

09) as 03.

10) as 03.

11) as 03.

12) as 03.

Using the gazeteer is an easy way to achieve more professional looking plots.

Command: **GRID**

Use: To specify a grid of user defined spacings over all or part of the display area.

Parameters:		Default:
01)	colour_of_fishnet (i)	10
02)	width_of_fishnet_lines (r)	0.1
03)	multiplier_for_fishnet_lines (i)	Plot dependent
04)	easting_of_bottom_left_corner (i)	Plot dependent
05)	northing_of_bottom_left_corner (i)	Plot dependent
06)	easting_of_top_right_corner (i)	Plot dependent
07)	northing_of_top_right_corner (i)	Plot dependent

Example: GRID 3 0.1 1000 256000 248000 264000 254000

Notes:
01) any Dgener8 colour index
02) millimetres
03) display area units
04) as 03
05) as 03
06) as 03
07) as 03

A 1km grid is often used on maps of 1:50000 but any user defined interval can be displayed.
GRID can be specified at any point in the control file but, it is plotted after all data. To force Dgener8 to plot the grid, the following command can be used.

GRID NOW

NOTE: The grid can be turned-off by the command -

GRID OFF

Command: **INCL**

Use: To include another Dgener8 command file within the current command file.

Parameters:		Default:
	01) file_name (c*)	N/A

Example: INCL /users/dtm/rwf/rivers_and_lakes.d8

Notes: 01) Either relative or full path name (do not use special characters)

Nesting of files is permitted so the user can include files that themselves have include commands within them. However, DO NOT include files that try to include command files that are already in use as this will quickly fill the file stack and will cause the package to abort.
This facility is convenient because if you regularly plot, for example, rivers, lakes and coastline you can have a command file with these three commands entered with the users chosen parameters - every time thereafter that these three are required the user has to simply include the relevant command file.

Command: **INST**

Use: To define an inset box which becomes the new display area until it is turned off. The inset can be used to plot localised areas at a larger scale.

Parameters:

		Default:
01)	easting_bottom_left (i)	N/A
02)	northing_bottom_left (i)	N/A
03)	easting_top_right (i)	N/A
04)	northing_top_right (i)	N/A
05)	outline_colour (i)	10
06)	outline_width (r)	0.1
07)	outline_style (i)	0
08)	easting_of_new_location (i)	N/A
09)	northing_of_new_location (i)	N/A
10)	magnifying_factor (r)	1.0

Example: INST 258000 264000 261000 266000 6 2.0 0 262000 267000 2.0

Notes:

01) in display area coordinates
02) as 01
03) as 01
04) as 01
05) any Dgener8 colour index
06) m llimetres
07) any Dgener8 line style
08) as 01. This indicates the new location of the rectangle described in 01, 02, 03, 04.
09) as 08.
10) Magnifying factor. If your main plot is at 1:50000 and you specify a rectangle for insetting with a magnification factor of 2, the inset area ill be plotted at 1:25000.
So, if the rectangle that you describe is 1km by 1km, the inset will appear at the new bottom-left location with a dimension of 1km by 1km at 1:25000 e.g twice as big as the initial area.

This facility can be used to plot extra data in a specific area. For example, the display area may be Great Britain at 1:5000000 but it would be possible to produce an inset of the Wallingford area at 1:50000.

NOTE: In order to turn-off the inset and return to the original display area, issue the command, INST, without any parameters i.e issue the command

INST

Command: **INTR**

Use: This switches Dgener8 into interactive mode, allowing the user to input commands from the standard input (usually the keyboard).

Parameters:	Default:
None	N/A

Example: INTR

Notes: This command allows the user to produce a standard plot and from a control file and then switch into interactive to add further items. It can be useful when first learning to use Dgener8 and the user is practising with display styles. It is also useful at the design stage of an important map.

To switch back to the command file see the command RTRN.

Command: **ISOL**

Use: To specify the required data type and style of isolines to appear in the display area.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	colour (i)	2
03)	width (r)	0.1
04)	style (i)	0
05)	size_of_label (r)	1.5
06)	colour_of_label (i)	2
07)	multiplier_of_label (r)	1.0
08)	number_of_decimal_places_of_label (i)	0
09)	multiple_on_which_isolines_emphasised (i)	1000
10)	width_of_emphasised_isolines (r)	0.2
11)	minimum_value_to_be_displayed (i)	-99999999
12)	maximum_value_to_be_displayed (i)	99999999

Example: ISOL OSCO 2 0.1 0 0.3 2 0.1 0 500 0.2 100 2000

Notes:

01) OSCO = Ordnance Survey 1:50000 digital contours (These are stored in units of 10cm so, if they are required to appear at metres, 07 should be set to 0.1)
4170 = SAAR 4170
POTE = Potential evaporation
FILE = Isolines held in a user defined file which will be defined on the subsequent line in the command file (for more information on this see command FILE)

02) any Dgener8 colour index
03) millimetres
04) any Dgener8 line style
05) millimetres
06) any Dgener8 colour index (set to -1 to switch off labels)
07) label will be displayed as stored but can be altered by use of this - see note accompanying 01.
08) controls the number of decimal places that are displayed in the label (set to 0 for integer display)
09) isoline multiple value that line should be emphasised on. If an isoline dataset is in metres and the user required isolines on the multiple of 50 e.g 50 100 150 etc. to be emphasised, this value would be set to 50.
10) millimetres (this is the width of emphasised lines)
11) this allows the user to omit from display all isolines below this value.
12) this allows the user to omit from display all isolines above this value.

It is useful to have some knowledge of the 'vertical' resolution at which isolines are stored (see The Spatial Data Manager).
For a list of the defaults for each individual data type, see Appendix 1.

Command: **KEYA**

Use: To specify that a key annotation should appear for the data that is specified in the following line in the command file.

Parameters:		Default:
01)	key_annotation (s)	N/A

Example: KEYA Ordnance Survey 1:50000 contours.

Notes: 01) any user defined text

If special characters are required these can be incorporated within the text. These include the facilities to express subscripts, superscripts, symbols from the Dgener8 Marker Index and multi-line text. See the User Manual.

Command: **KLOC**

Use: To specify that an entry should appear in the key showing the whereabouts of the display area in relation to the country as a whole and also the relevant 1:50000 map sheets that cover the display area.

Parameters:			Default:
	01)	width_of_country_locator (r)	50.
	02)	width_of_map_locator (r)	50.

Example: KLOC 50. 50.

Notes:
01) millimetres
02) as 01

To suppress either of the locators, set its width to 0. IN DGENER8 VERSION 1, THE WIDTH OF EACH LOCATOR IS FIXED AT 50.

Command: **LABL**

Use: To display user defined textual labels with or without markers.

Parameters:

		Default:
01)	colour (i)	10
02)	size (r)	2.0
03)	style (i)	850
04)	text_colour (i)	10
05)	text_size (r)	2.0
06)	offset (i)	3
07)	angle (r)	0.
08)	easting (i)	N/A
09)	northing (i)	N/A
10)	label (s)	N/A

Example: LABL 2 3.0 850 2 3.0 3 0. 274340 342720 Site for new station.

Notes:

01) any Dgener8 colour index
02) millimetres
03) any Dgener8 marker symbol index (set to 0 if no marker is required)
04) as 01.
05) as 02.
06) offset from the grid reference that label is to be displayed - if it is assumed that the grid reference is at position 5, the following diagram displays where the label will be placed

7	8	9
4	5	6
1	2	3

therefore, a value of 3 will position the start of the label below and to the right of the grid reference. So, for the example above the result would be -

■ Site for new gauging station.

07) angle of text e.g 90. = vertical
08) display area coordinates (these are ignored if an input file is used, see 07)
09) as 05
10) text label to be displayed
FILE can also be used whereby the following line in the command file gives a file name containing coordinate pairs and text labels. This is used when many labels are required. A typical entry in the command file would be -

```
LABL 1 3.0 850 1 3.0 3 0. -1 -1 FILE
FILE LABS /users/dtm/rwf/labels.list
```

The format of this file would be -

```
easting_1 northing_1 textual_label_1
easting_2 northing_2 textual_label_2
etc.
```

If a textual label and no marker is required, the marker index should be set to 0. If a marker and no text is required, a blank is supplied as the label.

Command: **LINE**

Use: Simple command to draw a line between two specified points.

Parameters:		Default:
01)	easting_start (i)	N/A
02)	northing_start (i)	N/A
03)	easting_end (i)	N/A
04)	northing_end (i)	N/A
05)	colour (i)	10
06)	width (r)	0.1
07)	style (i)	0

Example: LINE 264522 367845 272345 371024 6 0.2 0

Notes:
01) display area units
02) as 01
03) as 01
04) as 01
05) any Dgener8 colour index
06) millimetres
07) any Dgener8 line style

Command: **MAPP**

Use: To overlay recognised map series outlines on the display area.

Parameters:		Default:
01)	map_series (c4)	N/A
02)	colour_of_outlines (i)	2
03)	width_of_outlines (r)	0.1
04)	style of outlines (i)	0
05)	infill_colour (i)	-1
06)	label_colour (i)	2
07)	label_size (r)	3.0
08)	inset_style (i)	-1
09)	alternate_colour (i)	-1
10)	min_map	-99999999
11)	max_map	99999999

Example: MAPP LAND 3 0.2 0 -1 3 4.0 3 6 0 9999

Notes:
01) LAND = Ordnance Survey 1:50000 Landranger
02) any Dgener8 colour index
03) millimetres
04) any Dgener8 line style
05) as 02 (set to -1 for no infill)
06) as 02
07) as 03
08) as 04 - an inset can be plotted at 80% of the size of the actual map sheet. This can help to identify map edges where a number of sheets overlap. This facility is likely to be used only in data validation.
09) as 02 - odd numbered maps can be displayed in an alternate colour. This can help to identify map edges where a number of sheets overlap. This facility is likely to only be used in data validation.
10) only map sheets with numbers between min_map and max_map will be displayed.
11) as 10

Command: **MILN**

Use: To specify the required data type and style of miscellaneous lines that are to appear in the display area.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	colour (i)	3
03)	width (r)	0.1
04)	style (i)	0
05)	size_of_label (r)	0.0
06)	colour_of_label (i)	-1
07)	multiplier_of_label (r)	1.0
08)	number_of_decimal_places_of_label (i)	0
09)	multiple_on_which_lines_emphasised (i)	1000
10)	width_of_emphasised_lines (r)	0.1
11)	minimum_value_to_be_displayed (i)	-99999999
12)	maximum_value_to_be_displayed (i)	99999999

Example: MILN OSFL 3 0.1 0 0.3 2 0.1 0 100 0.1 100 2000

Notes:

01) OSFL = Ordnance Survey 1:50000 digital form lines (These are stored in units of 10cm so, if they are required to appear at metres, 07 should be set to 0.1)
OSBR = Ordnance Survey 1:50000 digital break lines (These have no height value associated with them)
OSRL = Ordnance Survey 1:50000 digital ridge lines (These have no height value associated with them)
FILE = Lines held in a user defined file which will be defined on the subsequent line in the command file (for more information on this see command FILE)

02) any Dgener8 colour index
03) millimetres
04) any Dgener8 line style
05) millimetres
06) any Dgener8 colour index (set to -1 to switch off labels)
07) label will be displayed as stored but can be altered by use of this - see note accompanying 01.
08) controls the number of decimal places that are displayed in the label (set to 0 for integer display)
09) line multiple value that line should be emphasised on. If a line dataset is in metres and the user required lines on the multiple of 50 e.g 50 100 150 etc. to be emphasised, this value would be set to 50.
10) millimetres (this is the width of emphasised lines)
11) this allows the user to omit from display all lines below this value.
12) this allows the user to omit from display all lines above this value.

The Ordnance Survey form and ridge lines are hand sketched to help their own DTM generation algorithm. They are, therefore, to be used advisedly.

NOTE

Use: To specify a note that should appear in the key.

Parameters:			Default:
	01)	note (s)	N/A

Example: NOTE The data displayed has not been validated. ETON

Notes: 01) The text string supplied has to be terminated with the word ETON (NOTE backwards). If this is not done, Dgener8 will interpret the rest of the control file as being part of the note.

FILE = Text for note held in a user defined file which will be defined on the subsequent line in the command file (for more information on this, see command FILE). The text in the file does NOT need to be terminated with the word ETON.

Command: **POIN**

Use: To specify the required data type and style of points to appear in the display area.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	colour (i)	1
03)	size (r)	2.0
04)	style (i)	850
05)	label_size (r)	2.0
06)	label_colour (i)	2
07)	label_multiplier (r)	1.0
08)	dec_places (i)	0
09)	label_position (i)	3
10)	display_value (i)	1
11)	min_val (r)	-99999999
12)	max_val (r)	99999999

Example: POIN OSSH 6 1.0 850 2.0 3 0.1 3 3 -99999999. 99999999

Notes:

01) OSSH = Ordnance Survey 1:50000 spotheights
FILE = Points held in a user defined file which will be defined on the subsequent line in the command file (for more information on this see command FILE)

02) any Dgener8 colour index

03) millimetres

04) any Dgener8 marker index

05) as 03

06) as 02

07) label will be displayed as stored but can be altered by use of this.

08) controls the number of decimal places that are displayed in the label (set to 0 for integer display)

09) offset from the point that label is to be displayed - if it is assumed that the point is at position 5, the following diagram displays where the label will be placed

```
7   8   9
4   5   6
1   2   3
```

therefore, a value of 3 will position the start of the label below and to the right of the point.

```
■
 2940
```

10) 0 = no value or grid reference
1 = just value
2 = just grid reference
3 = grid reference and value

11) minimum value to be displayed
12) maximum value to be displayed

11 and 12 are only valid if the value is numeric.

Command: **POLY**

Use: To specify the required data type and style of polygons to appear in the display area.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	colour (i)	4
03)	width (r)	0.1
04)	style (i)	0
05)	infill_colour (i)	-1
06)	infill_pattern (i)	-1
07)	size_of_label (r)	0.0
08)	colour_of_label (i)	-1
09)	multiplier_of_label (r)	1.0
10)	number_of_decimal_places_of_label (i)	0
11)	minimum_value_to_be_displayed (i)	-99999999
12)	maximum_value_to_be_displayed (i)	99999999

Example: POLY OSLK 4 0.2 0 4 0 1.0 5 0.1 0 0 500

Notes:

01) OSLK = Ordnance Survey 1:50000 digital lakes (These are stored in units of 10cm so, if they are required to appear at metres, 09 should be set to 0.1)
OSCS = Ordnance Survey 1:50000 digital coastline
C250 = IH coastline at 1:250000
C500 = IH coastline at 1:500000
FILE = Polygons held in a user defined file which will be defined on the subsequent line in the command file (for more information on this see command FILE)

02) any Dgener8 colour index
03) millimetres
04) any Dgener8 line style
05) any Dgener8 colour index (-1 to switch off infill)
06) not supported, solid infill only
07) millimetres
08) as 01 (-1 to switch off labelling)
09) label will be displayed as stored but can be altered by use of this - see note accompanying 01.
10) controls the number of decimal places that are displayed in the label (set to 0 for integer display)
11) this allows the user to omit from display all lines below this value.
12) this allows the user to omit from display all lines above this value.

If infill is required and the accessed polygons do not have identical first and last points, they will not be infilled.

Command: **RAST**

Use: To specify the data type and manner of display for raster data.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	colour_for_undefined_values (i)	0
03)	multiplying_factor (r)	1.0
04)	centre_offset (i)	1
05)	label_colour (i)	-1
06)	label_size (r)	0.0
07)	decimal_places (i)	0
08)	offset_of_label (i)	0
09)	resolution (i)	0
10)	accelerator (i)	0
11)	minimum_value_to_be_displayed (r)	-99999999
12)	maximum_value_to_be_displayed (r)	99999999

Example: RAST HGHT 0 0.1 5 6 2.0 0 2 0 1 0. 3000.

Notes:

01)

HGHT =	IHDTM elevation data based on a 50m grid with vertical resolution 10cm.
SURF =	IHDTM surface type grid based on a 50m grid.
OUTF =	IHDTM outflow directions based on a 50m grid.
INFL =	IHDTM inflows based on a 50m grid.
CCAR =	IHDTM cumulative catchment area based on a 50m grid.
ITLC =	ITE Land Cover data based on a 50m grid.
URBN =	ITE urban/suburban data based on a 50m grid.
R90A =	IH rainfall for January 1990 based on 1km grid.
R90B =	IH rainfall for February 1990 based on 1km grid.
etc.	
4170 =	IH SAAR 4170 based on 1km grid.
POTE =	IH Potential Evaporation based on 1km grid.
M52D =	
M525 =	
SNOW =	
FILE =	Raster data held in a user defined file which will be defined on the subsequent line in the command file (for more information on this see command FILE)

02) any Dgener8 colour index - this determines colour of raster values that are undefined.

03) multiplier to be applied to data before display - this interacts with the colours and limits set by the command BAND.

04) this determines how the cell is displayed in relation to the grid

05) any Dgener8 colour index (set to -1 if actual raster values are not to be displayed)

06) millimetres

07) number of decimal places to be used if numeric values are to be displayed

08) the position of label in relation to the grid point - if it is assumed that the centre of the cell is at position 5, the following diagram displays where the label will

be placed

7	8	9
4	5	6
1	2	3

therefore, a value of 2 will display the label directly below the centre of the grid point.

09) resolution at which data is to be displayed.
0 = display at resolution at which data is stored
1 = display at coarse resolution - this is used when testing for data presence

10) if the raster data is being used as a backdrop, the accelerator can be switched on and a noticeable increase in speed can be achieved, however, if a partial raster set is being overlaid on existing data, the accelerator should be switched off.
0 = accelerator switched off
1 = accelerator switched on

11) this allows the user to omit from display all values below this value.

12) this allows the user to omit from display all values above this value.

For up to date information on the raster datasets available it is advisable to see The Spatial Data Manager who can also supply information on the specification of all the sets listed above.
When using a set such as URBN which has values of 0 for non-urban/suburban and 1 for urban/suburban it is advisable to set the minimum displayed value to 0.5 and the maximum displayed value to 1.5. This will speed display and also prevent non urban/suburban areas obliterating data that is already in the display area.

Command: **RTRN**

Use: This switches Dgener8 from interactive mode back to command file mode. If no current command file is open, Dgener8 assumes that there are no more commands to come.

Parameters:	Default:
None	N/A

Example: RTRN

Notes: This command allows the user to return to the command file or to indicate completion of the current run of Dgener8.
To switch into interactive mode see the command INTR.

Command: **SCAL**

Use: To specify the scale at which the map is to be produced. This command should come immediately after the AREA command.

Parameters:		Default:
01)	scale (i)	Plot dependent

Example: SCAL 25000

Notes: 01) this value acts as the denominator of the scaling ratio so a value of 50000 would give a ratio of 1/50000 or 1:50000.

See commands AREA and SIZE.

Command: **SIZE**

Use: This is an alternative to using the commands AREA and SCAL to determine the size of the map display area.

Parameters:		Default:
01)	x_dimension_of_display_area	N/A
02)	y_dimension_of_display_area	N/A

Example: SIZE 400. 500.

Notes:
01) millimetres
02) millimetres

This works in conjunction with the command AREA to determine the scale that a map will appear at. It can be useful when using a screen when areas of different dimensions wish to be viewed - they will automatically be scaled to fit the display area.

See commands AREA and SCAL.

Command: **SOIL**

Use: To specify the data type and manner of display for soil raster data.

Parameters:

		Default:
01)	data_type (c4)	N/A
02)	colour_for_undefined_values (i)	0
03)	multiplying_factor (r)	1.0
04)	centre_offset (i)	1
05)	label_colour (i)	-1
06)	label_size (r)	0.0
07)	decimal_places (i)	0
08)	offset_of_label (i)	0
09)	resolution (i)	0
10)	accelerator (i)	0
11)	minimum_value_to_be_displayed (r)	-99999999
12)	maximum_value_to_be_displayed (r)	99999999

Example: SOIL HOST 0 0.1 5 6 2.0 0 2 0 1 0. 3000.

Notes:

01) HOST = HOST dominant soil type based on a 1km grid.

02) any Dgener8 colour index - this determines colour of soil types that are undefined.

03) multiplier to be applied to data before display - this interacts with the colours and limits set by the command BAND.

04) this determines how the cell is displayed in relation to the grid

05) any Dgener8 colour index (set to -1 if actual raster values are not to be displayed)

06) millimetres

07) number of decimal places to be used if numeric values are to be displayed

08) the position of label in relation to the grid point - if it is assumed that the centre of the cell is at position 5, the following diagram displays where the label will be placed

```
7   8   9
4   5   6
1   2   3
```

therefore, a value of 2 will display the label directly below the centre of the grid point.

09) resolution at which data is to be displayed.
0 = display at resolution at which data is stored
1 = display at coarse resolution - this is used when testing for data presence

10) if the soil data is being used as a backdrop, the accelerator can be switched on and a noticeable increase in speed can be achieved, however, if a partial raster set is being overlaid on existing data, the accelerator should be switched off.
0 = accelerator switched off

1 = accelerator switched on

11) this allows the user to omit from display all values below this value.

12) this allows the user to omit from display all values above this value.

For up to date information on the soil datasets available it is advisable to see The Spatial Data Manager.

Command: **TITL**

Use: To specify the title of the map to appear in the key.

Parameters:

		Default:
01)	title (s)	Untitled

Example: TITL The Lake District

Notes: 01) any user defined text

If special characters are required these can be incorporated within the text. These include the facilities to express subscripts, superscripts, symbols from the Dgener8 Marker Index and multi-line text. See the User Guide and Manual.

Guide to paper orientation for use with the Dgener8 DEVI command

REVISION OF NOTE OF 8 NOVEMBER 1995

The note of 8-11-95 contained two errors:

- the examples for A4 output were wrong
- it is not true that paper x and y dimensions are related to direction of paper feed.

I apologise for any confusion that this may have caused.

Revised guide to the use of the DEVI parameters

Just picture your final map: the paper will have a long side, a short side and its orientation will be either portrait (staNd) or landscape (laY). The highlighted letters in the words 'staNd' and 'laY' are the key to the setting of the 'rotate' parameter.

On all the plotters that I have tried, parameter 2 corresponds to the dimension of the short side of the paper, and parameter 3 to that of the long side.

So the DEVI command for output to a postscript file can be thought of as:

DEVI POST paper-short-dimension paper-long-dimension paper-orientation paper-colour

where orientation is N for staNd (portrait), or Y for laY (landscape)

Examples

A4 landscape format
DEVI POST 210. 297. Y
A4 portrait format
DEVI POST 210. 297. N

A3 landscape format
DEVI POST 297. 421. Y
A3 portrait format
DEVI POST 297. 421. N

Versatec landscape format
DEVI POST 870. 1500. Y
Versatec portrait format
DEVI POST 870. 1500. N

(The A4, A3 and Versatec short sides above are the approximate maximum sizes)

Please let me know if you find any exceptions to this rule.

DGM 5 December 1995