

# Contents for Landscape Explorer Help

Landscape Explorer is an application for all those interested in the way the world's surface looks. It enables the user to translate a flat, two dimensional map into a full three dimensional representation which can be examined from any viewpoint - go exploring without ever leaving your PC!

The application uses the MDI (Multiple Document Interface) model, and consists of two sub-applications, the [Landscape Viewer module](#) which is used to examine a surface, and the [Map Definition module](#) which is used to define the characteristics of the surface to be explored. The items enabled in the application menus are dependent upon which module is currently active.

Landscape Explorer is a fairly complex program, but to get a quick idea of it's capabilities it's worthwhile having a look at a few [sample landscapes](#) first.

This application is Shareware. If you find it useful you should [register](#) the product with [WoolleySoft](#). There are significant benefits to doing so - see How to [Register](#) for details. [WoolleySoft](#) also offers a range of other services.

This version of Landscape Explorer was officially released on 1st May 1993. If you are using this software on or after the 31st December 1994 you do not have the current version and will be missing out on features and functionality.

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# Memory Issues

Landscape Explorer requires fairly large amounts of memory in order to run properly. If you have less than 8Mb of RAM you should have a windows swapfile installed. If you do not, and this is a good idea generally for all windows systems, you can add one using the virtual memory option in the control panel '386 enhanced' utility. Microsoft recommend using the 'permanent' option, and 8 - 12Mb seems to be optimal on most computers.

This program was developed on a 486SX25 with 8Mb RAM and an 8Mb swapfile, and has been tested on a variety of other computers with varying amounts of memory. I would recommend at least 12Mb of total (RAM + Virtual swapfile) memory for routine use.

# What's new in version 1.25

Support for USGS DEM file import. This includes all 7.5-minute and 30-minute DEMs, and 1-degree DEMs south of 50 degrees north. 7.5-minute and 15-minute Alaskan DEMs are not supported.

Various other minor improvements to the [Map definition tools](#). Minor bug fix to map status tool.

# What's new in version 2.00

Support for British Ordnance Survey PANORAMA Digital Terrain Model Data.

Support for MapInfo derived data. This uses a general x,y,z,terrain attribute file that could also be used to import data from other packages. Full file format description is included.

Auto-trace contour tool. Allows the map definition module to automatically define spot heights from an identified contour.

Colour Schemas and user-definable terrain colours. Up to 16 additional terrain types may be defined and stored. This is particularly useful for users wishing to plot soil types etc. You can associate schemas with maps. See Colour settings for details.

New drawing schemes - Framework and contour II. Optional inclusion of grid in all terrains. See View Parameters for details.

Copy data to clipboard in metafile format.

Better printing.

Various changes to user interface, particularly in the View Parameters dialog.

## **IMPORTANT**

IMPORTANT: To avoid conflict with MapInfo files, which also have use the .map suffix, Landscape Explorer map files have been renamed to \*.lem. There is no format change, and all you need to do to read your old files is to rename them.

# WoolleySoft - Other Services

WoolleySoft is run by Kevin Woolley, a professional Information Technology specialist with over 10 years experience of computer systems and applications at all levels from programming to systems and business analysis. Particular areas of expertise include Windows, database systems, networks, and business applications.

WoolleySoft is committed to developing stimulating and informative shareware applications. However we can also undertake custom software development and offer consultancy on many aspects of computer systems and business. If you are interested please contact WoolleySoft at

WoolleySoft, Humblesknowe Cottage, Ramoyle, Dunblane, Perthshire, Scotland Tel. 0786 825406

Kevin can also be reached by e-mail on the internet at [kjw1@stirling.ac.uk](mailto:kjw1@stirling.ac.uk), or at 100332,2104 on CompuServe. Please send mail to the internet unless you have an account on CompuServe.

When not working with computers Kevin's time is taken up looking after his young son and climbing all the mountains in Scotland. One day he hopes to move to the end of a Kilostream line on the west coast and combine all three!

# Quickstart Sample Landscapes

Landscape explorer comes with maps for the following landscapes already defined. You may like to go exploring!

## Crater Lake - crater.map

Crater Lake. Oregon. USA. This shows the eastern half of the lake, including Wizard island, at fairly low resolution. Crater lake was created when the top of Mount Mazama collapsed during volcanic eruptions 7000 years ago. The lake, 8km across, is surrounded by cliffs which rise steeply from the water to form a jagged rim in places 600m high. The area was designated as the USA's 5th national park in 1902.

This map was created by importing a 7.5-minute DEM file into a 7 x 7km map with 90m gridpoints (i.e. every third DEM elevation). See [Import DEM](#) for more details about DEM files.

## Ben Lomond - lomond.map

Loch Lomond is Britain's largest expanse of fresh water, and the east side of the loch is dominated by Ben Lomond. Relatively easy to climb, and near the population centres of the Scottish central belt, it receives a lot of attention from walkers. It remains however a superb mountain.

This map was created using a scanned image from the Ordnance Survey Landranger sheet 56.

## Hebridean Islands - mingulay.map

Mingulay and Berneray are the southmost inhabitable islands in the outer Hebrides, and two of the most dramatic. Both have steep sea cliffs facing into the Atlantic gales.

The last inhabitants left Mingulay (the larger island) in 1934, in a similar manner to the more famous St Kilda further west - indeed the lives of the inhabitants must have been very similar both centred around crofting and harvesting the seabirds on the cliffs.

Berneray now has nothing beyond a few old lighthouse keepers cottages.

This map was created using a scanned image from the Ordnance Survey Landranger sheet 31.

# How To Register

This application is Shareware. If you find it useful you should register the product with WoolleySoft. Registered users receive the current version of the software, notification of updates, and product support. If you wish I can also include a disk of sample import data (mainly USGS DEMs to be used with the Import DEM facility).

We do try and respond to your ideas, and version 2.0 includes many improvements suggested by registered users. Registering ensures that you can contribute to this process, and if you have a idea we can use you'll receive the next update using it free. The registered version is often 6+ months ahead of the distributed version, so you may find you're missing out on 'must have' features if you don't. Ideas we're considering at the moment include DDE, using a bitmap as terrain (thus allowing fine features to be shown), and movie generation. Please contact us if you require further information.

Although we follow ASP (Association of Shareware Professionals) guidelines by not crippling our software, there are several useful features which are not included in the distributed version, see the 'additional features' section following the order information below.

Product support is available by e-mail on the internet and CompuServe as well as by telephone and standard mail.

You can register directly with WoolleySoft, on CompuServe, or with PsL. Please note that although we charge a standard £ 35 if you pay in British Pounds, the price in American Dollars varies according to the method used to take account of our overheads in converting currencies.

## Registering with WoolleySoft

Direct registration with WoolleySoft costs £ 35 or \$60. Send your order to

WoolleySoft, Humblesknowe Cottage, Ramoyle, Dunblane, Perthshire, Scotland FK15 0BA

We cannot accept credit/debit cards (but PsL can, see below). Non-British orders should pay by a cheque drawn against a British bank (foreign banks can easily arrange this), international money order or equivalent, or travellers cheques. Please make your cheque etc. payable to WoolleySoft.

An order form is included with the distributed files.

## Registering via CompuServe

Use the Shareware Registration service (GO SWREG). You may find the following information useful to locate the program.

Author:	Kevin Woolley
CompuServe ID:	100332,2104
Program Title:	LANDSCAPE EXPLORER V1.25
Registration ID:	2099

Registration on CompuServe cost \$50

## Registering via PsL

## CREDIT CARD ORDERS ONLY

Registration with PsL costs \$55

You can order with MC, Visa, Amex, or Discover from Public (software) Library by calling 800-2424-PsL or 713-524-6394 or by FAX to 713-524-6398 or by CIS Email to 71355,470. You can also mail credit card orders to PsL at P.O.Box 35705, Houston, TX 77235-5705.

THE ABOVE NUMBERS ARE FOR ORDERS ONLY.

Any questions about the status of the shipment of the order, refunds, registration options, product details, technical support, volume discounts, dealer pricing, site licenses, etc, must be directed to [WoolleySoft](#) at the address given for direct registration above.

To insure that you get the latest version, PsL will notify us the day of your order and we will ship the product directly to you.

The PsL reference number for Landscape Explorer is 11239.

## **Additional Features in Registered Version**

Additional features in the current registered version (as of 1st April 1993)...

More colour schemes for the Landscape Viewer - Winter, Desert , Polar, Contour etc.

Metafile copy of landscape views is disabled in the distributed version - you can still copy a bitmap image to the clipboard but this will give a poorer print if you import into another product, such as a word processor.

The Import NTE, Import Text and Import xyz facilities are disabled in the distributed version.

The Analyse DEM file analysis function providing further support for US Geological Survey Digital Elevation Model (DEM) files is not available in the distributed version.

Support for Imperial measurements (miles, feet) is included in the registered version.

The registered version includes various improvements to the Map Definition Module tools, including an enhanced interpolate heights function and an Auto-trace contour tool.

The registered version fully implements the terrain colour settings functions.

We also intend to continue enhancing Landscape Explorer's basic features such as drawing speed, ease of use, user customization etc. Ideas currently being considered include DDE, using a bitmap as terrain (thus allowing fine features to be shown), and movie generation. Please contact us if you require further information.



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# View Projection

Opens a window to display a map using the Landscape Viewer module. The map to be loaded, and initial view parameters are both prompted for. Multiple copies of this window may be opened, subject to system resource constraints. See also the entry for Application Menu.

# Define Map

Opens a window containing the Map Definition module. Only one copy of this window may be opened at once.

# Exit

Exits Landscape Explorer.

# Introduction to the Map Definition Module

Before viewing a landscape you must define the shape and contents of the surface that you wish to examine. Landscape explorer holds surface information in the form of a rectangular grid. The grid (sample) points hold the heights, whilst the grid (terrain) squares the type of terrain. The dimensions of the grid can be any size from 1 to 99 Kilometres or Miles (depending on the measurement type selected when creating the new map) with grid point spacing set by the user so that there are between 400 and 15,800 sample points. Realistic looking landscapes usually require 10,000 sample points or more. Data is stored in \*.LEM files, which are referred to as maps.

It is assumed that you are working from a hardcopy of a map and do not have access to digitised information, (although a data import facilities for text, Ordnance Survey NTF, USGS DEM, and x,y,z,attribute files is provided - see import... for details).

Obviously defining the heights of this number of sample points individually would be a long and tedious task, so to speed up this process the map definition module implements a range of tools to help. Perhaps the most noteworthy of these are auto-contour tracing and a sophisticated interpolate heights function that may be used to automatically calculate the heights of undefined sample points.

The map definition module is activated by choosing Define Map from the Options menu. The displayed window has three main parts. A Toolbar that gives you fast access to the different tools you will require to define the map. A Parameter Display area down the left hand side of the window which shows the current colour coding for heights and terrain types, and an initially blank area representing the 'Canvas' used to define the map.

The Canvas can display three types of information: sample point heights, terrain types and a background bitmap loaded using the Load Bitmap tool.

To define a new map the user would typically go through the following steps...

Enter the map definition module by choosing define map from the define map menu.

Create a new map of the appropriate size and grid spacing using the new map tool.

Use the display parameters tool to display a full range of colours for the variation in heights expected.

Import and size a bitmap of the original paper map using load bitmap and set bitmap magnification tools. This would typically be created as a .BMP file using a scanner.

Trace sufficient contours and set heights so as to give a reasonable definition of the shape of the landscape surface - using for example the trace contour and set spot height tools.

Use the interpolate heights tool to fill in undefined points.

Define any areas that do not contain the default terrain type (low vegetation) using the terrain tools (set terrain (by area) or set terrain (by block), or perhaps flood flat areas with water.

Save the map and view using the landscape viewer module.

# Sample Point Heights Display

When enabled (see [Map Function Status](#)) the height of each sample point is displayed as a small solid square. The precise size of the square will vary depending on the display size of the map canvas area, but should be optimised to display a large enough square for the colour to be apparent whilst remaining small enough so as not to obscure any background bitmap. No squares are shown for undefined heights, and sample points at sea level (zero metres/feet) are always shown as single points.

Landscape explorer uses a range of 15 solid colours to indicate into what range the height of a sample point falls. The current ranges and associated colours are shown in the Parameter Display area to the left of the map canvas. You may adjust the total displayed range using the [Display Parameters](#) tool.

# Terrain Type Display

There are seven different types of terrain, default or base, water, wood, town, road, rock and sand.

The unless explicitly defined otherwise, all grid squares are assumed to have the default terrain (in most colour schemes used by the Landscape Viewer this corresponds to low vegetation) which is not displayed on the canvas. Any group of grid squares that does not have the default terrain is shown outlined with the appropriate colour.



# Import Facilities

Besides providing tools for capturing data from a bitmap image, Landscape Explorer can also import data from a variety of other sources, and this feature is expected to expand in the future - we are also looking at DDE - but please provide feedback as to what you would like to see!

Import can be selected from the menu or the Map Definition Module tool bar. An 'open file' dialog box is presented with a drop-down list containing the import types available.

Current facilities provided are as follows:-

## **ASCII Text Files**

Import Text is a basic method that can be used when all else fails! Useful for Lotus 1-2-3 and other spreadsheet data.

## **US Geological Society DEM files**

The Import DEM function allows the user to import a set of heights data from a US Geological Survey digital elevation model (DEM) file. Further information about DEM file formats is also available under the Analyse DEM function.

## **UK Ordnance Survey NTF files**

The Import NTF facility can be used to import data from files produced by the UK Ordnance Survey. Currently this is limited to DTM files derived from the Landranger series of maps.

## **X,Y,Z,Attribute - MapInfo etc.**

The Import XYZ facility is designed to import data exported from commercial GIS programs, such as MapInfo and Arc/Info. It allows a complete map to be defined including size, terrain and heights information.

# Map Definition Module Tools

The following tools are available both from the Tools menu and the Toolbar...

Map Function Status

Display Parameters

Load Bitmap

Set Bitmap Magnification

Set Spot Height

Manual Trace Contour

Auto-Trace Contour

Set Heights Level

Set Heights to Null

Set Random Heights to Null

Interpolate Heights

Set Terrain (by square)

Set Terrain (by area)

Flood with Water

Move Bitmap

Close Up

Analyse DEM File

Import...

# New Map

Creates a new map. A dialog box prompts for the following items:

## Units

You can define the map in metric or imperial units. Selecting the appropriate radio button modifies the dialog to correspond to your choice.

## Size

Enter the required length and width of the map, and the distance between grid points. Note that this version of Landscape Explorer can only accept integer values.

## Terrain Configuration

The colour schema edit box allows you to set a default colour schema to be used by the map. This should be entered as a single word of up to 8 characters - for example 'standard' would be an acceptable schema name. You will probably wish to set up a number of standard schemes to cover sets of maps showing common types of data, for example you may have a set called 'glacial' to cover maps showing glacial soil types, 'aluvial' for aluvial soil types etc. Your schema name should correspond to that of a .CFG file set up using the [Colour Settings](#) dialog. For further details see the explanation about 'Saving and Using Colour Schemas' under the [Colour Settings](#) topic.

# Open Map

Opens an existing map file. A dialog box prompts for a \*.MAP file to be selected.

# Save Map

Saves changes to the map you have been working on.

When you choose Save, the map remains open so you can continue working on it.

# **Save Map As**

Saves a new or existing picture as a .LEM file.

When you choose Save As, the map remains open so you can continue working on it.

# Map Function Status

Displays a dialog box showing the map name, size, sample point spacing, grid size, associated colour schema and the bitmap displayed (if any).

The colour schema edit box allows you to set a default colour schema to be used by the map. This should be entered as a single word of up to 8 characters - for example 'standard' would be an acceptable schema name. You will probably wish to set up a number of standard schemes to cover sets of maps showing common types of data, for example you may have a set called 'glacial' to cover maps showing glacial soil types, 'aluvial' for aluvial soil types etc. Your schema name should correspond to that of a .CFG file set up using the [Colour Settings](#) dialog. For further details see the explanation about 'Saving and Using Colour Schemas' under the [Colour Settings](#) topic.

A set of check boxes allows the user to choose which of the background bitmap, height and terrain data to display. However as the data type manipulated by the currently selected tool must be displayed, one of these check boxes may be disabled.

# Display Parameters

Displays a dialog box that allows the user to set the height range for colour display. This defaults to 0 - 1000 metres/feet.

This dialog also allows the user to set the default terrain type used by the terrain and close up tools. This can also be set directly by clicking on the chosen default terrain in the Parameter Display area of the window.



# Load Bitmap

This displays a bitmap, typically a scanned image of the original paper map, as background. A .BMP file is prompted for by a standard 'open file' dialog.

The bitmap may be moved using the Move Bitmap tool, and its magnification altered by the Set Bitmap Magnification function.

All sample point heights and terrains are displayed (if enabled - see Map Function Status) superimposed on the background bitmap, which is typically used as a template for defining map information.

# **Set Bitmap Magnification**

Prompts for the bitmap magnification to be used in pixels per kilometres or pixels per mile, and defaults to 50. The value to be used may be calculated, but as it depends on the precise characteristics of the original scan is probably best arrived at by trial and error.

# Set Spot Height

Prompts for the height of the sample point selected. Enter either null or a height between 0 and 9999 metres/feet.

Note that the unregistered version of Landscape Explorer only allows maps to be defined using metric measurements, the registered version also allows imperial measurements (miles, feet etc.) to be used.

# Trace Contour

Allows a series of sample points along a line to be set to the same height. Typically this tool would be used to trace the contour lines on a bitmap loaded as background.

The tool uses a combination of the left and right mouse buttons. To start a contour press the left mouse button. You may now either move the mouse whilst holding down the button, or release the button and click again at another position. In both cases a red line highlights where the contour will be placed. Continue defining the contour using any combination of these actions until complete, then click the right button. A dialog box prompts for the height of the contour, which must be between 0 and 9999 metres/feet.

# Set Heights Level

Click and drag using the left mouse button to define a rectangular area. On release a dialog box prompts for a height between 0 and 9999 metres/feet to which all sample points within the area will be set.

# Set Heights to Null

Click and drag using the left mouse button to define a rectangular area. On release a dialog box prompts for confirmation that sample points in the defined area are to be set to null.

# Set Random Heights to Null

Click and drag using the left mouse button to define a rectangular area. On release a dialog box prompts for confirmation that a random 50% of sample points in the defined area are to be set to null.

# Interpolate Heights

This tool will interpolate the heights of undefined (null) sample points for either the whole map or a selected area.

Interpolation uses a combination of recursive bezier curve and trend analysis to calculate missing heights. A smoothing transform may also be applied.

The proportion of defined to undefined sample points required depends on the kind of landscape being defined. For smooth, rounded hills or plains reasonable results may be obtained with 1 point in 20 or less. For more complex structures 1 in 5 or less is recommended. Interpolation is most accurate where the surface has few discontinuities - so for a valley with steep sides and a flat bottom placing two or three contour lines along the sides will be sufficient to derive the shape of the sides. However, in the absence of other information the interpolation function will assume a continuation of the sides to form an overdeepened vee, so you will need to block in some of the valley floor.

An minimum height setting is available for the interpolation function to help defining sea coasts and other areas of water. This cannot be altered from sea level (zero height) in the unregistered version. So to define an island draw the appropriate contour lines and spot heights for the island, and an area of sea at zero height for two or more sample points around the coast before applying interpolation.

Note that you should try to define as many grid points as possible on the edges of the map, and particularly at the corners. This is because in the body of the map the function can interpolate data from all directions, whereas at an edge the available data, and hence accuracy, is more limited.



# Set Terrain (by square)

Allows terrain squares to be 'painted' to a particular terrain type by moving the mouse with the left button held down. Squares are set to the active terrain type, which can be set either using the [Display Parameters](#) dialog or clicking on the required terrain type in the Parameters Display area.

# Set Terrain (by area)

Click and drag using the left mouse button to define a rectangular area. On release a dialog box prompts for the terrain type to which all the terrain squares in the defined area will be set.

# Flood with Water

Flood fills :-) any flat area of the map with water. After defining the shape of your landscape click on a suitable terrain square. If the four bounding sample points define a flat square (with non null) a dialog will prompt for confirmation that all contiguous flat terrain squares at the same height are to be set to water.

# Move Bitmap

This allows a bitmap to be moved under the grid. Grab the bitmap using the left mouse button and release when positioned correctly.

# Close Up

This tool allows the user to select a 11 x 11 area of grid points for display in a subsidiary window.

The selected area may be scrolled over the map. The close up window must be closed before work can continue with the main Map Definition window.

The close up window always displays heights and terrains, and may display the background bitmap if display for this is enabled. Within the window the left mouse button is used for heights and the right for terrains. A single click in sets the corresponding height or terrain to the default, whilst a double click displays a dialog box that allows the height or terrain to be set to a specific value - which then becomes the default.

# Analyse DEM File

This tool is used to analyse a DEM data file prior to import to facilitate correct setting of map parameters.

Full details of DEM file formats can be obtained from the US Geological Survey (if you have access to mosaic and the internet their World Wide Web server is well worth a visit), however they basically consist of a set of parallel profiles arranged south to north, each profile being a one-dimensional array of elevations arranged west to east, thus describing a quadrilateral area. DEM files can be obtained from USGS and various anonymous ftp sites - a good selection of 7.5-minute DEM's are available from [spectrum.xerox.com](http://spectrum.xerox.com).

USGS produce the following types of DEM file:-.

## 7.5-minute DEM

7.5-minute quadrangle. Horizontal coordinate system uses UTM on North American Datum of 1927 (NAD 27) or 1983 (NAD 83). Elevations are referenced in metres or feet to the National Geodetic Vertical Datum of 1929 (NGVD 29) in the continental US, and to local mean sea level in Hawaii and Puerto Rico. Spacing of elevations along and between each profile is 30 metres, and the profiles may not always have the same number of elevations because of the variable angle between true north and the grid north of the UTM coordinate system.

## 30-minute DEM

1- by 1-degree block. Horizontal coordinate system is Geographic (lat/long) on World Geodetic Survey (WGS) 72 or WGS 84. Elevations are referenced in metres in the continental US and Alaska, and to local mean sea level in Hawaii and Puerto Rico. Spacing of elevations along and each profile is 3 arc seconds. Spacing between profiles is 3 arc seconds south of 50 degrees north, and 6 or 9 arc seconds above this. DEMs north of 50 degrees are not handled correctly by Landscape Explorer [version 2.00](#).

## 7.5-minute and 15-minute Alaska DEM

These DEMs are not handled correctly by Landscape Explorer [version 2.00](#).

# Import Text

This function allows the user to import a set of heights data from a textfile (for example data exported from a spreadsheet), and is only available in the registered version.

Version 2.00 of Landscape Explorer can only import ASCII/ANSI space delimited text - i.e. a text file which you can view using Notepad or Write (with no conversion) and consists of numbers separated by spaces or newlines. This type of file is, for instance, created by the Lotus 1-2-3 extract function.

Data is imported in a linear fashion starting at the top right corner of the map progressing left to right within top to bottom through all points. The program will report an error if an incorrect number of heights is encountered.

# Import DEM

This tool allows the user to import a set of heights data from a US Geological Survey digital elevation model (DEM) file. Further information about DEM file formats is available under the [Analyse DEM file](#) function.

A typical DEM file will contain many more grid points than Landscape Explorer can handle directly. The function therefore presents a dialog box that allows the user to specify a set of parameters that control how the data from the import file will be mapped on a Landscape Explorer map. These are as follows:-

## Sample Size

Specify X and Y offsets from the origin used by the imported data. For DEM files this is the south west corner (bottom left on the map display canvas). Hence if you specified an X,Y offset of 50,80 the point at 50,80 in the imported data is mapped onto the bottom left corner of the map display canvas (0,0). Similarly the point 60,100 from the import data would be mapped onto 10,20.

Note that 7.5-minute DEMs may have differing numbers of elevations per profile, particularly for the first and last few profiles. In this case it is advisable to apply offsets that will not import data from these profiles.

## Sampling Frequency

Specifies the frequency at which points from the imported data will be mapped onto the map display canvas. A value of 1 implies all points will be mapped, 2 implies every second point etc.

## Terrain Configuration - Use Schema

The default colour schema to be used by the map. This should be entered as a single word of up to 8 characters - for example 'standard' would be an acceptable schema name. You will probably wish to set up a number of standard schemes to cover sets of maps showing common types of data, for example you may have a set called 'glacial' to cover maps showing glacial soil types, 'aluvial' for aluvial soil types etc. Your schema name should correspond to that of a .CFG file set up using the [Colour Settings](#) dialog. For further details see the explanation about 'Saving and Using Colour Schemas' under the [Colour Settings](#) topic.

## Map Options

With DEM files you can only choose to import the data into the existing map.

## Default Height

Some import files may not contain data for all points on the map definition canvas. You can therefore provide a default height.



# Introduction to the Landscape Viewer

This module displays a view of a previously defined map in a window. The map may be viewed from any direction using a variety of different drawing schemes such as simple grid, summer colours, winter colours etc. (some of which are disabled in the unregistered version). The position of the light source may also be moved and you will probably wish to try varying some or all of these features to obtain the best results.

Multiple copies of the Landscape Viewer module may be opened, subject to system resource constraints. The map to be loaded and initial view parameters are prompted for after selecting the View Projection item from the Options menu.

See also the entry for Application Menu.

# Cascade

Arranges the open windows in a cascade.

# Save Picture

Saves changes to the picture you have been working on.

When you choose Save, the Landscape Viewer module remains open so you can continue working with the projection.

# **Save Picture As**

Saves a new or existing picture as a .BMP file.

When you choose Save As, the Landscape Viewer module remains open so you can continue working with the projection.

# Print

Prints the current view of the map. On Mono printers the basic grid often gives the best results, and you can adjust the size of the printed image using the Magnification control in the View Parameters Dialog.

# Printer Setup

Selects a printer and sets printer options for Landscape Explorer before printing. The available options depend on the printer you select.

# Copy (as Bitmap)

Click and drag using the left mouse button to define a rectangular area of the landscape viewer window that will be copied to the clipboard.

The picture will be copied as a bitmap, better printing quality can be obtained using the Copy (as Metafile) function.

# Set Parameters

Displays a dialog box that allows the user to set the parameters that will be used to draw the current projection of the map. If any values are changed the projection is redrawn. The following parameters may be set.

## Projection Viewpoint

This describes the viewer's position in terms of altitude and azimuth. Altitude may range from 0 to 90 degrees where 0 is horizontal with and 90 vertically above the map. Azimuth ranges from 0 to 355, corresponding to the compass bearing.

## Light Source Position

This describes the position of the the light source in terms of altitude and azimuth in a similar manner to that described for the Projection Viewpoint above.

## Vertical Scaling

The default setting (left of the slider) draws the projection completely to scale. However with flat landscapes it may be useful to exaggerate changes in height. Moving the slider to the right increases the vertical scaling by a factor of up to ten times.

## Magnification

The default setting (centre of the slider) sizes the projection to fit comfortably within the window. This can be changed to give a larger or smaller drawing by suitable positioning of the slider bar. A range of 20% to 200% of default size is available.

## Terrain Settings

A grid may be superimposed on the landscape: select black, grey or white from the drop down box to include - this feature is particularly useful with the Framework scheme. Leave as the default (none) to omit the grid.

Note that this is not effective with the No Colour scheme, which always draws the grid in black.

The radio buttons allow the user to choose between using the current default terrain schema, or that previously associated with this map (if any). See [Colour Settings](#) for details.

## Colour Scheme

The following colour schemes are available

Contour I: Draws the projection coloured according to altitude. The scheme used is the same as that in the [Map Definition Module](#).

Contour II: Draws the projection coloured according to altitude. The scheme used is graduated from green through blue to red.

Desert: Draws the projection to give an impression of a hot desert landscape. Includes light source and terrain information.

Framework: Draws the projection with grid squares coloured according to terrain, but with no shading.

Summer: Draws the projection to give an impression of a temperate climate landscape in summer. Includes light source and terrain information.

No Colour: Draws the grid squares as simple open quadrangles. Light source and terrain are



ignored.

Polar: Draws the projection to give an impression of a polar landscape. Includes light source and terrain information.

Winter: Draws the projection to give an impression of a temperate climate landscape in winter, with snow covering the higher ground. Includes light source and terrain information.

## **Customise Terrain Colours**

The button accesses the [Colour Settings](#) dialog.

# Tile

Tiles the open windows.

# Arrange Icons

Arranges iconised windows.

# Close All

Closes all open windows.

# Auto-Trace Contour

Allows a series of sample points along a line to be set to the same height. This tool is used to trace the contour lines on a bitmap loaded as background, and behaves in a similar manner to the Trace Contour tool. Your background bitmap must be black detail on a white background, and you may find it helpful to 'clean up' the image with a paint package before use.

To start tracing a contour press the left mouse button over a contour line. The program will now proceed to follow the black line over the image, overwriting in red as it does so. On completion a dialog box prompt for the height of the contour, which must be between 0 and 9999 metres/feet.

# Import X,Y,Z,Attr

This facility is designed to import data exported from commercial GIS programs, such as [MapInfo](#) and Arc/Info. It allows a complete map to be defined including size, terrain and heights information.

This format was developed in conjunction with John McCombs of Integrated Mapping, who can supply an add-in module for exporting the data in a suitable form from [MapInfo](#). Follow the link for details.

The function presents a dialog box that allows the user to specify a set of parameters that control how the data from the import file will be mapped on a Landscape Explorer map. These are as follows:-

## Sample Size

Specify X and Y offsets from the origin used by the imported data. For x,y,z files this is the south west corner (bottom left on the map display canvas). Hence if you specified an X,Y offset of 50,80 the point at 50,80 in the imported data is mapped onto the bottom left corner of the map display canvas (0,0). Similarly the point 60,100 from the import data would be mapped onto 10,20.

## Sampling Frequency

Specifies the frequency at which points from the imported data will be mapped onto the map display canvas. A value of 1 implies all points will be mapped, 2 implies every second point etc.

## User Terrain - Import Terrain Definitions

If checked any terrain definitions contained in the file header will be imported. This is equivalent to loading a colour schema using the [colour settings](#) dialog, and the imported map will be drawn on the map display canvas using the new [colour settings](#).

## Terrain Configuration - Use Schema

The default colour schema to be used by the map. This should be entered as a single word of up to 8 characters - for example 'standard' would be an acceptable schema name. You will probably wish to set up a number of standard schemes to cover sets of maps showing common types of data, for example you may have a set called 'glacial' to cover maps showing glacial soil types, 'aluvial' for aluvial soil types etc. Your schema name should correspond to that of a .CFG file set up using the [Colour Settings](#) dialog. For further details see the explanation about 'Saving and Using Colour Schemas' under the [Colour Settings](#) topic.

## Map Options

You can choose either to import the data into the existing map, or to let the program create a new, correctly sized, map using the information provided in this dialog box.

## Default Height

Some import files may not contain data for all points on the map definition canvas. You can therefore provide a default height, which may either be an absolute value or relative to the lowest height used from the import file.

## X,Y,Z Format

All records are comma delimited. Coordinate system uses the SW corner as origin. Attribute refers to the terrain square to the NE of coordinate. User defined terrain colours and descriptions import is included as this information is easily available from [MapInfo](#) and maintains consistency across applications. However, it is not obligatory.

#### RECORD 1

Header record. Measurement System (m|i),min x, min y, max x, max y, x spacing, y spacing, attributes included (attr|noattr)

#### RECORD 2

Description. Free format.

#### RECORD 3

Number of user-colours defined (nominally n, max 16, may be 0).

#### RECORDS 4 to 4+N

Terrain number,colour definition (RGB format - Red + 256 \* Green + 65536 \* Blue),terrain description (max 24 characters).

#### RECORDS 4+N+1 TO END OF FILE

Data. X coord, Y coord, Height, Terrain type.

### **Example**

m,2262300,5617000,2267900,5628000,100,100,attr

Derived from TR\_STYPE

3

1,0,BdU

2,255,BnH

3,65535,BnR

2266400,5617000,1531.74,9

2266300,5617100,1520.17,9

2266400,5617100,1519.89,9

# Import Ordnance Survey NTF

This facility can be used to import data from files produced by the UK Ordnance Survey. Support is currently limited to the Land-Form PANORAMA Digital Terrain Model Data (DTM) files produced from the Landranger series of maps. This data can be obtained from the Ordnance Survey (Tel. 0703 792773), but does, I believe, command a premium price. However, a free sample can be obtained covering the Port Talbot area of Wales, and if you are an educational user Gower, Peak District, Lake District, Bristol and Glasgow are also available.

The files cover a 20km x 20km area with height values at each intersection of a 50 metre horizontal grid.

A DTM file contains more data points than a Landscape Explore map can handle, The function therefore presents a dialog box that allows the user to specify a set of parameters that control how the data from the import file will be mapped on a Landscape Explorer map. These are as follows:-

## Sample Size

Specify X and Y offsets from the origin used by the imported data. For DTM files this is the south west corner (bottom left on the map display canvas). Hence if you specified an X,Y offset of 50,80 the point at 50,80 in the imported data is mapped onto the bottom left corner of the map display canvas (0,0). Similarly the point 60,100 from the import data would be mapped onto 10,20.

## Sampling Frequency

Specifies the frequency at which points from the imported data will be mapped onto the map display canvas. A value of 1 implies all points will be mapped, 2 implies every second point etc. The default value of 4 will produce a low-resolution map of the whole file if the default option to create a new map is also chosen (see below).

## Terrain Configuration - Use Schema

The default colour schema to be used by the map. This should be entered as a single word of up to 8 characters - for example 'standard' would be an acceptable schema name. You will probably wish to set up a number of standard schemes to cover sets of maps showing common types of data, for example you may have a set called 'glacial' to cover maps showing glacial soil types, 'aluvial' for aluvial soil types etc. Your schema name should correspond to that of a .CFG file set up using the Colour Settings dialog. For further details see the explanation about 'Saving and Using Colour Schemas' under the Colour Settings topic.

## Map Options

You can choose either to import the data into the existing map, or to let the program create a new, correctly sized, map using the information provided in this dialog box.

## Default Height

Some import files may not contain data for all points on the map definition canvas. You can therefore provide a default height.



# MapInfo

An add-in module to export data from MapInfo in a suitable form for import into Landscape Explorer can be obtained from John McCombs of Integrated Mapping.

You may wish to contact WoolleySoft in the first instance, but he may be approached directly at.

Integrated Mapping,  
PO Box 2708,  
Christchurch,  
New Zealand.  
Fax +64 3 365 5755.

The company's E-mail address is [info@inmap.co.nz](mailto:info@inmap.co.nz), but you may prefer to contact him directly at [john@inmap.co.nz](mailto:john@inmap.co.nz).

John has been main main beta tester for this release, as well as providing many valuable comments and ideas about facilities to include. Thanks John! (and isn't the internet WONDERFUL).

# Directories and Paths

This displays a dialog prompting for the path to the directory containing the colour schema (.CFC) files. If this is left blank it will use the directory from which the program was run.

# Colour Settings

Version 2.0 of Landscape Explorer offers considerable control over how terrains are be displayed. The program uses two types of terrains, standard and user-defined. Both types are controlled by the Colour Settings dialog. If this dialog is accessed from the View Parameters dialog colour changes will only apply to the view being drawn. Alternatly, if you access the dialog from the menu changes will be applied to the global program settings - thus effecting the map definition module and the defaults for any new views drawn.

## Standard Terrains

There are currently 8 standard terrains, corresponding to pre-defined terrain types such as water and forest. You may alter the colours used for all but the base colour type, but the names are fixed.

## User Terrains

Up to 16 user terrains may be defined, and unlike the standard terrains you may specify both the colour and names of these terrains. User terrains can be imported in .XYZ files - see import xyz for details.

## Storing and Using Colour Schemas

You can store and use colour schemas at several different levels. Landscape Explorer loads a default set of colours at start-up, and you can save any set of colours as these defaults using the Save button in the Defaults group box. The Reset button in the same box restores the standard program defaults.

You can also save colour schemas in a .CFG file. Use the Save As button in the File group box to do this. You can load a previously saved schema using the Load button in the same group box.

As described above, changes made in the Colour Settings dialog are applied globally if the dialog is accessed from the menu, but only locally to the current view if accessed from the View Parameters dialog.

You can also associate a colour schema with a map file - this can either be done on creation using the New Map or one of the import dialogs, or for an existing map using the map status dialog. The schema name corresponds to that of a .CFG file, and the program looks for this file in either the current directory or that specified by the Directories dialog.

# Base Colour

This is the default terrain type, and how it will be handled depends on the colour scheme being used to draw the projection. For example, the Summer colour scheme will treat this as grassland, and the Framework scheme will draw white squares.

# Copy (as Metafile)

Copies the current view to the clipboard as a re-sizable metafile. You can paste this into any product that accepts a metafile format.

You will produce higher quality output using metafiles than using the [copy \(as bitmap\)](#) function.



