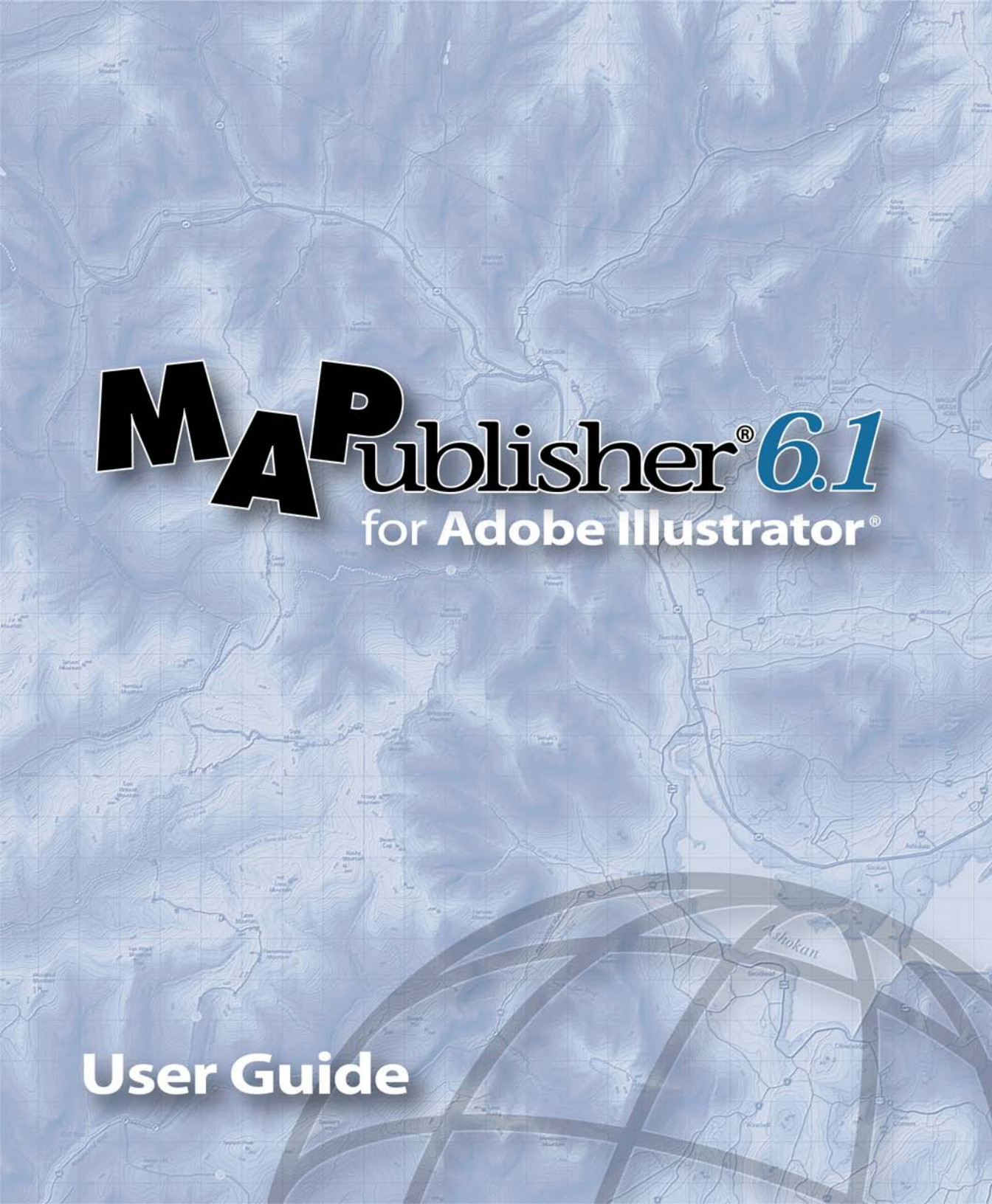
MAPublisher® 6.1
for Adobe Illustrator®
User Guide

AVENZA™ MAPublisher® 6.1 USER GUIDE

MAPublisher 6.1 for Adobe Illustrator User Guide for Windows and Macintosh.

We would like to thank Safe Software for contributing technical documentation which has been used in the Appendices of this User Guide. Please see the Acknowledgements (page A4/1) for contact information.

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MAPublisher 6 User Guide for Adobe Illustrator
Version 6.1
Avenza Systems Inc. December, 2004

MAPublisher® 6.1 for Adobe® Illustrator®

User Guide

Avenza SYSTEMS INC.

Welcome

Avenza welcomes you to mapmaking in the 21st century!

Combined with Adobe Illustrator, MAPublisher has revolutionized the art of mapmaking by allowing spatial data files to be used to create maps inside a vector graphics program. MAPublisher allows all your cartographic tasks to be performed where they should be done; in a powerful graphics environment.

MAPublisher 6 improves on the already powerful tools of previous versions by adding additional file support, additional tools and improvements to existing tools.

This manual assumes that the user is familiar with Adobe Illustrator 10 or CS and has at least a basic understanding of geographic information systems (GIS) terminology and concepts. Please refer to your Adobe Illustrator user guide for more information on using Adobe Illustrator. A glossary of GIS terms is included at the back of this manual.

By following this manual you will learn how to create maps using the MAPublisher filters in Adobe Illustrator. This manual covers the concepts necessary to build a map and perform fundamental cartographic and GIS tasks. A variety of GIS data has been provided on your MAPublisher 6 CD for use with this guide and the Tutorials PDF (see Appendix 2), however we do encourage you to experiment with your own data to gain additional experience with MAPublisher's tools and functions.

Together MAPublisher and Adobe Illustrator will give you a totally integrated cartographic design software system with graphics tools and geographic functions present in the same work environment.

So join first class mapping organizations from around the world and experience modern day map-making by reading this user guide, going through the tutorials and experimenting with MAPublisher 6.

Contents

What's New in MAPublisher 6

Please read the following section if you are familiar with MAPublisher prior to version 6.0.

FEATURE MANIPULATION ENGINE

Avenza has teamed with Safe Software *(http://www.safe.com)* to introduce core FME functionality into MAPublisher. FME is capable of converting GIS data between a variety of different file formats and also hosts an extensive library of projections and datums. Subsequently the number of supported import and export formats have increased again in this version of MAPublisher. Furthermore MAPublisher 6 supports over 4500 coordinate systems with which you can transform your data.

IMPORTING MAP DATA

MAPublisher 6 introduces many more supported import formats. Please see the Map Data File Formats section on pages 20-22 for an overview of the formats supported in this version.

The Import process itself has undergone some major changes. In MAPublisher 6 there are two new GIS Import mechanisms named ***Simple Import*** and ***Advanced Import***. Simple Import is designed to provide a fast way to import one file, or several files of the same data type and projection, whereas Advanced Import provides functionality to import a number of files of differing data types and/or projections. Advanced Import also provides the ability to reproject files prior to import by selecting from a projection list, by using a listed file, or by reprojecting to match existing MAP Layers. You can also specify projections prior to import in both the import filters. The new Importers are now located under the File menu, replacing the Import Map and Import Points filters that existed in previous versions.

IMPORT AUTO-GRAIN

MAPublisher 6 will apply grain values automatically if the points per path contained in the incoming data exceeds the limitations of Adobe Illustrator. This function replaces the need to specify these values manually, and will only be activated if it is required.

MAP VIEWS

There are two key elements to Map Data in MAPublisher 6. The first change is that MAP Layers will now carry a unique feature type, meaning that only one MAPublisher feature type will be recognized (Area, Line, Point, Text or Legend) on a single layer. The second is that MAP Layers will be held inside distinct MAP Views, which are distinct coordinate systems either automatically created via the import process or manually by the user.

The ***MAP Views*** palette, which is new in version 6, and similar to Illustrator Layers palette, will display the unique coordinate systems in the document. All MAP Layers will be shown as being hosted by a particular MAP View. If you have multiple coordinate systems in your document, you can drag layers from one MAP View to another, providing the means to quickly reproject your data. Additionally new layers can be dragged into existing MAP Views, which will automatically give the layer and its data georeferencing and MAPublisher status (thereby replacing the MAP Creation functions in previous versions). When dragging new layers into MAP Views, you will be prompted to set the feature type of that layer. Note that if you wish to create Grids, Legends, Scalebars and North Arrows, you must now create a new layer to host this data. The feature type of this layer should be set to 'Legend' when you drag it to your desired MAP View. Similarly to label features you must have a Text layer available on which the labels will be placed.

As all MAP Layers will now carry a unique feature type, the layers created via import will be appended with a suffix to indicate the feature type of that layer. Additionally these feature types will be preceded with an icon depicting the feature type in the MAP Views palette and the majority of MAPublisher dialogs.

The MAP Views palette hosts additional options which replace certain tools from previous versions:

1. ***MAP View Editor***: This contains the options that were formerly found in the *Input* and *Output* sections of the *Projection Editor*, and both the *Transform Scale* and *Add MAP Parameters* filters. It also allows you to specify and change the name of the selected MAP View.
2. ***Source Projection***: This option was formerly *Store Projection* in MAPublisher 5.0's *Projection Editor.*
3. ***Export***: Formerly found within the host program's *Export* option. MAPublisher 6 provides many more supported export formats. Please see the Map Data File Formats section on pages 20-22.

MAP STYLESHEETS

MAP Stylesheets is new to MAPublisher 6, and will allow you to quickly create and apply legends based on the Styles and Symbols that exist in these respective Illustrator palettes. Stylesheets are created inside a MAPublisher dialog, where specific values contained in the attribute table for the related layer are assigned to Illustrator symbology. The MAP Stylesheets tool operates on a one to one basis, where specific attribute values are assigned with a specific style or symbol (e.g. Attribute Value A = Style 1). Attribute value ranges and boolean expressions are not supported by MAP Stylesheets. Stylesheets will be listed in a ***MAP Stylesheets*** palette, so that more than one stylesheet can be used.

For value ranges and boolean expressions, *Assign Legend Info* and *Auto Assign Legend Info* can continue to be used as in previous versions.

POINT DATA

Point Data is now based on vector symbology rather than by text as in previous versions. Point Plot uses symbols which are available in the Illustrator Symbols palette. ASCII Delimited Text Files imported as points will be created as a circular point which will be added to the Illustrator Symbols palette. The symbol used for your points can be changed via the use of the Legend filters or MAP Stylesheets. The geographic coordinate of points created via import or through Point Plot, is coincident with the centre of the symbol.

Note that the text anchor point, denoting the geographic location of points in previous versions, will be used to determine the centre of point symbols after legacy files have been converted to the MAPublisher 6 format. See page 13 for information on Legacy Conversion.

SECURITY

MAPublisher 6 incorporates a new licensing system that is designed to deter casual, unauthorized copying of the software. Activation protects the intellectual property and innovation at the heart of the software industry. Avenza is committed to eliminating unauthorized use of its software and is doing so in a manner designed to have a minimal effect on licensed users. Activation maintains customer privacy and does not change the terms of the existing Product License Agreement. Please refer to page 15 for more information on Licensing procedures in MAPublisher 6.

NEW IN MAPUBLISHER 6.1

Please read the following section for information on the major new functions incorporated into MAPublisher since the release of MAPublisher 6.0.

SINGLE PLUG-IN

MAPublisher 6.1 is a single plug-in, thus dramatically increasing speed and performance.

JOIN POINTS

New to MAPublisher in version 6.1 is a filter to join symbols based on attribute values. This tool will generate a line string joining common points, and is ideal for GPS data. Please see pages 95-96.

EDIT COLUMN: GRAPHICAL PROPERTIES

The Edit Column filter has been modified to enable the scaling and rotation of point symbols based on a specified variable or by the contents of an attribute column. This filter will also allow text objects to be rotated. See pages 42-44 for guidelines on how to use this new function.

SEARCH PROJECTION

A new search tool has been added to all occurrences of the MAP View Editor and Source Projection, allowing you to perform a keyword search of the 4500 supported coordinate systems to find the projection that you require. For more information on this tool see pages 51 and 53 of this guide.

MAP LOCATION TOOL: COPY COORDINATES

Also new to the MAP Location Tool in MAPublisher 6.1 is the ability to copy the coordinates of a known point by simply holding down the shift key and clicking on the page. This function is ideal for quickly building point files. Please see page 37 for more information.

MAP VIEWS PALETTE: REMOVE MAPUBLISHER INFO

MAPublisher 6.1 contains functionality to quickly remove all MAPublisher information from your file. At the end of the project cycle it may be useful to remove all georeferencing and attribute information in the document to reduce file size. This can now be accomplished by simply dragging your MAP Layer(s) to the [Non-map layers] category in the MAP Views palette.

IMPORTING MAP DATA: LAYER SORT

Multi-feature imports are now automatically sorted by feature type. For example ArcInfo Export, AutoCAD and Microstation files may contain more than one feature type. Such files are now imported with text layers first, point layers second, line layers third, and area layers fourth in the layer hierarchy.

Chapter 1
Getting Started

Before using MAPublisher please read this section to ensure that you have a suitable hardware environment, become familiar with the installation procedure, and adequately prepare your system and workspace to make maps with Adobe Illustrator and MAPublisher 6.

The topics covered in this section are as follows:

System Requirements
MAPublisher Compatibility Notes
Installation Instructions
Registration and Licensing
The MAPublisher Tools
Preparing the Workspace

System Requirements

Before installing MAPublisher 6.1, please ensure that you have sufficient system resources, as outlined below:

WINDOWS

Minimum Requirements for MAPublisher 6.1 with Adobe Illustrator CS

- Adobe Illustrator CS
- Intel Pentium III or 4 processor, or equivalent
- Windows 2000 with Service Pack 3, or Windows XP
- 256 MB of RAM
- 300 MB of available hard-disk space
- CD-ROM Drive

Minimum Requirements for MAPublisher 6.1 with Adobe Illustrator 10*

- Adobe Illustrator 10.x
- Intel Pentium III or 4 processor, or equivalent
- Windows 2000 with Service Pack 3, or Windows XP
- 256 MB of RAM
- 300 MB of available hard-disk space
- CD-ROM Drive

MACINTOSH

Minimum Requirements for MAPublisher 6.1 with Adobe Illustrator CS

- Adobe Illustrator CS
- PowerPC G4 or above
- Mac OSX 10.2.8 or higher
- 256 MB of RAM
- 300 MB of available hard-disk space
- CD-ROM drive

Minimum Requirements for MAPublisher 6.1 with Adobe Illustrator 10*

- Adobe Illustrator 10.x
- PowerPC G4 or above
- Mac OSX 10.2.8 or higher
- 256 MB of RAM
- 300 MB of available hard-disk space
- CD-ROM drive

* Note: Certain non-English versions of Adobe Illustrator 10 are not supported by MAPublisher 6.1. Please contact *support@avenza.com* for more information.

MAPublisher Compatibility Notes

MAPublisher 6 is compatible with both Adobe Illustrator 10 and CS. Due to fundamental changes in MAPublisher with version 6, it is imperative that you read the following important compatibility information.

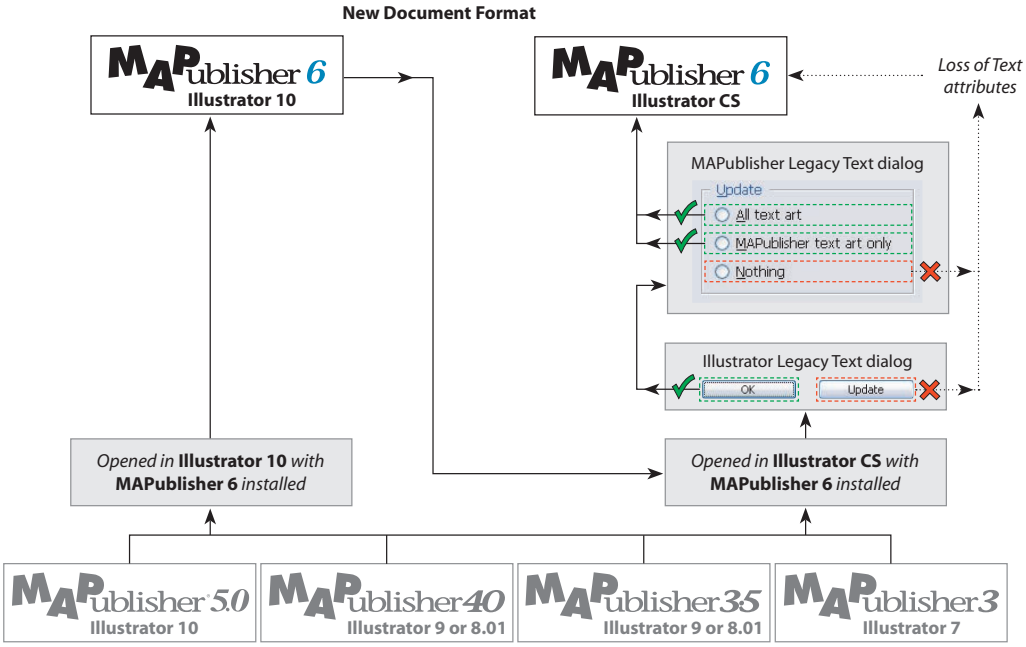
BACKWARDS COMPATIBILITY

MAPublisher 6 documents are not backwards compatible with previous versions of MAPublisher. Consequently, attribute and georeferencing information will be lost if a MAPublisher 6 document is opened with MAPublisher 5.0 or earlier. Furthermore, due to Adobe's redesigned text technology for Illustrator CS, MAPublisher 6 documents created in Illustrator CS are not backwards compatible to MAPublisher 6 in Illustrator 10.

LEGACY DOCUMENT CONVERSION

Due to MAPublisher's new standards on dealing with Point Data, opening legacy files in MAPublisher 6 will automatically convert font based points to symbols. However, Illustrator CS has new methods of dealing with text, which is therefore an additional part of the MAPublisher conversion process.

MAPublisher 6 / Illustrator CS: If the *Illustrator Legacy Text Conversion dialog* is activated when opening a legacy document, you **must click** '***OK***'. This will allow MAPublisher to use its own conversion utility to update text items. If you click '***Update***' the document will be opened, however all attributes associated with this text will be lost. If you receive the *MAPublisher Legacy Text Conversion dialog*, you must make one of the following choices:
✔ '***All text art***' to convert both MAPublisher text and regular Illustrator text to the new Illustrator text format.
✔ '***MAPublisher text art only***' to convert only MAPublisher text to the new Illustrator text format.
✖ '***Nothing***' to open the file but lose attribute information associated with MAPublisher text elements.



Installation Instructions

WINDOWS

1. Make sure that you have Adobe Illustrator 10.x or Adobe Illustrator CS installed on your computer. If Adobe Illustrator is running, exit the program.

2. If you planning to install MAPublisher 6.1 to Illustrator 10 and currently have MAPublisher 5.0 installed, remove MAPublisher 5.0 from your Adobe Illustrator 10 *'Plug-ins'* folder. This can be accomplished by running the *'Add or Remove Programs'* utility from the *Control Panel*. Alternatively you can navigate to the *'MAPublisher50'* folder located in the Illustrator 10 *'Plug-ins'* folder and then press the delete key, or drag the folder to the Recycle Bin.

3. ***CD version:*** Insert the MAPublisher 6.1 CD into your CD-ROM drive. If Autorun is disabled on your system, navigate to the *'MAPublisher 6.1'* directory on the CD, and double click the ***'Setup.exe'*** file.
   Electronic version: Double click the *'mp61wi-e.exe'* file to open the WinZip self extractor. When you have unzipped the files proceed to the *'MAPublisher 6.1'* directory and double click the ***'Setup.exe'*** file.

4. Proceed through the installation screens as instructed. Note that you can install to both Illustrator CS and Illustrator 10 simultaneously if you desire.
   Note that you will have options to install documentation and tutorial data. If you choose to install these components these files can be subsequently be found in the *Program Files\Avenza\MAPublisher* directory. Additionally you may access the documentation from the *Windows Start menu*. Go to *'All Programs',* and then navigate to the *'MAPublisher'* folder.

5. Launch Adobe Illustrator.
   Please proceed to the section on Registration and Licensing on the following page.

MACINTOSH

1. Make sure that you have Adobe Illustrator 10.x or Adobe Illustrator CS installed on your computer. If Adobe Illustrator is running, exit the program.

2. If you planning to install MAPublisher 6.1 to Illustrator 10 and currently have MAPublisher 5.0 installed, remove MAPublisher 5.0 from your Adobe Illustrator 10 *'Plug-ins'* folder. This can be accomplished by navigating to the *'MAPublisher50'* folder located in the Illustrator 10 *'Plug-ins'* folder and then pressing the command + delete keys, or by dragging the folder to the Trash.

3. ***CD version:*** Insert the MAPublisher 6.1 CD into your CD-ROM drive. Navigate to the *'MAPublisher 6.1'* directory on the CD, and double click the ***'Install MAPublisher 6.1'*** icon.
   Electronic version: Unstuff the *'mp61mi-e.sit'* file if this operation has not been completed automatically. Then proceed to the *'MAPublisher 6.1'* folder and double click the ***'Install MAPublisher 6.1'*** icon.

4. Proceed through the installation screens as instructed.
   Note that documentation and tutorial data will also be installed. After installation, these files can be found in the *Applications\Avenza\MAPublisher* directory. You can also choose to create an *Alias* to this folder at the end of the installation process which will be placed on your desktop.

5. Launch Adobe Illustrator.
   Please proceed to the section on Registration and Licensing on the following page.

Registration and Licensing

Avenza offers both single-user and floating licensing for MAPublisher 6. Floating licenses are designed to allow an organisation to buy a set number of licenses that can be used on any number of computers over a network. If you have purchased such a license system, you will have also received instructions on how to install the license server on your network and how to work with the *Checkout License* function.

The instructions below detail how to activate a single-user copy of MAPublisher 6. Note that MAPublisher will fail to function until you activate the software.

ACTIVATING A PURCHASED COPY OF MAPUBLISHER

1. To activate MAPublisher 6 you must supply Avenza Systems with the Serial Number which was supplied to you by Avenza when you purchased the product. The following guidelines can also be used to re-activate if you have inadvertently deleted your license file from your hard drive.

2. After installation of MAPublisher 6, launch the version of Adobe Illustrator you installed to. The *Activation Wizard* will appear automatically.
   If you wish to continue to use Illustrator without MAPublisher, you can cancel this wizard and activate MAPublisher later by navigating to the Help menu in Adobe Illustrator and then to ***MAP Security > Register****.*

   If you have an Internet connection, select the *'I want to activate the software over the internet'* option and click the *'Next'* button. At the second screen, select the option for *'I have already purchased MAPublisher and want to activate it now'* and then proceed through the wizard as instructed to complete the activation.

   If you do not have an Internet connection, select the *'I want to activate the software by telephone'* option and click the *'Next'* button. Then phone Avenza to supply us with the Machine ID you see on the Finish screen. We will then send you an email with a zipped licence file attachment. You must unzip this attachment and save the *.lic file to your *MAPublisher Plug-in* folder. This will be inside the Illustrator Plug-ins folder of your appropriate version(s).

ACTIVATING AN EVALUATION VERSION OF MAPUBLISHER

1. After installation of the MAPublisher 6 Demo, launch the version of Adobe Illustrator you installed to. The *Activation Wizard* will appear automatically.
   If you wish to delay the start of your 14 day evaluation period, you can cancel this wizard. When you are ready to activate MAPublisher, navigate to the Help menu in Adobe Illustrator and then to ***MAP Security > Register****.*

   If you have an Internet connection, select the *'I want to activate the software over the internet'* option and click the *'Next'* button. At the second screen, select the option for *'I want to activate a 14 day evaluation version'* and then proceed through the wizard as instructed to complete the activation.

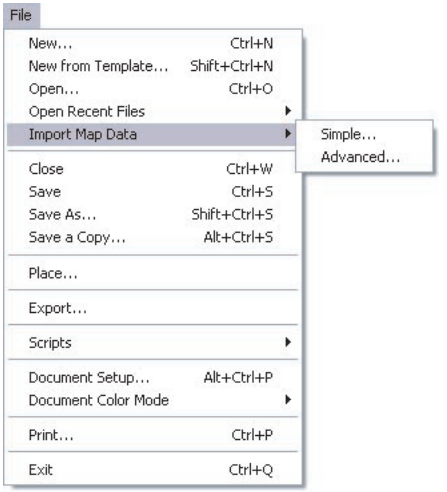
   If you do not have an Internet connection, select the *'I want to activate the software by telephone'* option and click the *'Next'* button. Then phone Avenza to supply us with the Machine ID you see on the Finish screen. We will then send you an email with a zipped licence file attachment. You must unzip this attachment and save the *.lic file to your *MAPublisher Plug-in* folder. This will be inside the Illustrator Plug-ins folder of your appropriate version(s).

2. When you are ready to purchase the software you can re-open the Activation Wizard at ***MAP Security > Register*** and follow the instructions listed on the second screen.

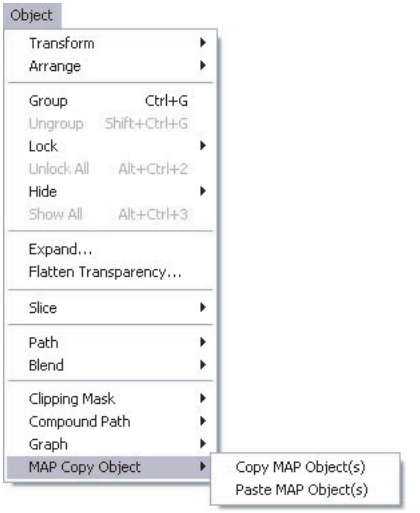
The MAP Tools

MAPublisher's tools can be found at a number of locations in Adobe Illustrator.

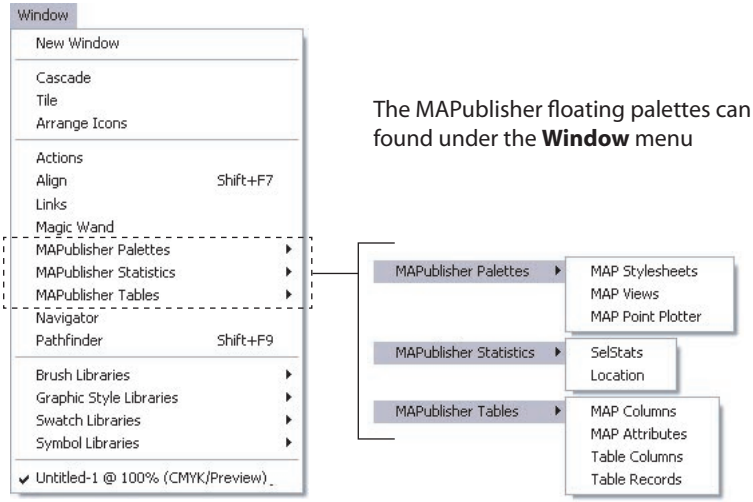
The MAPublisher Importers can be found under the **File** menu



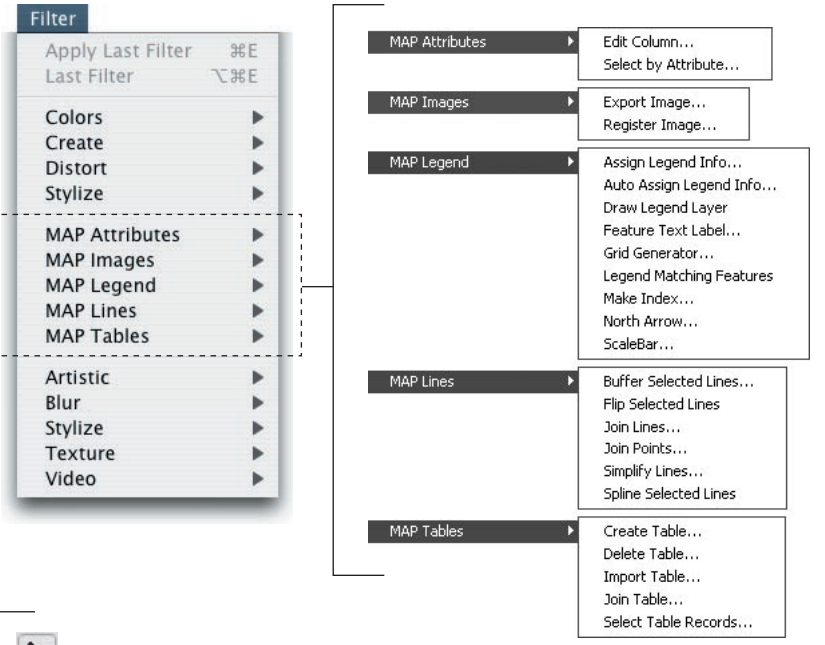
MAPublisher's Copy and Paste functions can be found under the **Object** menu

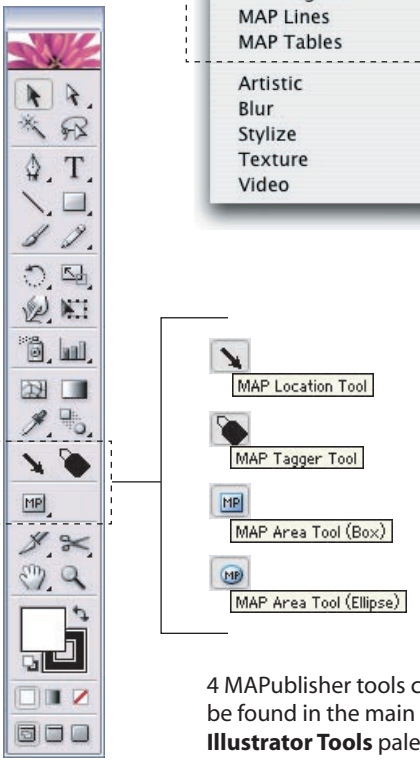


The MAPublisher floating palettes can be found under the **Window** menu



The majority of MAPublisher's tools are grouped into 5 categories under the **Filter** menu





4 MAPublisher tools can be found in the main **Illustrator Tools** palette

Preparing the Workspace

Before you can start using MAPublisher, you must first set up your Adobe Illustrator document. It is at this point that you define your page size and units, set your print orientation and generally prepare your Adobe Illustrator workspace.

SETTING UP YOUR DOCUMENT

1. Create a new Illustrator document by selecting *File* > *New,* or Select *File* > *Document Setup* if you already have a blank document open
   - *The Adobe Illustrator Document Setup window appears*

2. Select the size to use for your page. Letter (8.5"x11") is the default size*. You may wish to change the orientation to landscape for some files. For example, a map of Chile may be best displayed in Portrait but a map of Indonesia may be best displayed in Landscape.

3. If you have changed the page orientation in the previous step, you should also select *File* > *Print Setup*, and change the orientation in the print settings as well.

4. Select your desired page units. The default unit type is Points.

5. Ensure the page origin is at 0,0. To do this, select *View* > *Show Rulers*. Click the top left corner of the workspace where the vertical and horizontal rulers intersect and drag the cursor to the bottom left corner of the page. You may also double-click in the small square where the two page rulers intersect.

For more information and details regarding these operations please refer to your Adobe Illustrator User Guide.

** In step 2 the default page size of 8.5" x 11" is for North American versions of Adobe Illustrator. Other language versions of Adobe Illustrator may have different default page sizes. Consult your Adobe Illustrator User Guide for more information.*

Chapter 2
Map Data File Formats

The key to making maps with MAPublisher is the GIS data file formats it supports. GIS files are precise geographic data files that contain vector information and associated data attribute tables.

MAPublisher 6 will import AND export most of the industry leading vector file formats:

Import Formats
AutoCAD (*.dxf) (*.dwg)
ESRI ArcInfo Export (*.e00)
ESRI ArcInfo Generate (*.gen)
ESRI Shapefile (*.shp)
MapInfo Interchange (*.mif / *.mid)
MapInfo Table (*.tab)
Microstation (*.dgn)
TIGER/Line (*.rt1) (*.bw1)
USGS Digital Line Graph (*.dlg) (*.opt)
USGS SDTS (*.ddf)
ASCII Point (*.txt) (*.csv) (*.dat)

Export Formats
AutoCAD (*.dxf) (*.dwg)
ESRI ArcInfo Export (*.e00)
ESRI ArcInfo Generate (*.gen)
ESRI Shapefile (*.shp)
MapInfo Interchange (*.mif / *.mid)
MapInfo Table (*.tab)
Microstation (*.dgn)

This section will provide and overview of the formats outlined above, as well as additional considerations when using GIS data with MAPublisher.

For an in-depth analysis of further considerations when using these formats during Import, such as supported version numbers, supported colours and strokes, etc, please see pages A1/2 to A1/9.

AutoCAD Drawing (*dwg) and Drawing Exchange (*.dxf)
Import and Export

These file types are most commonly created by Autodesk's AutoCAD product, though other software programs such as Bentley MicroStation and various other computer-aided design (CAD) programs are capable of creating files in this format. There are two formats used by AutoCAD: DXF (drawing exchange format) files, which are large, and ASCII representations of the binary DWG (drawing) files. Logically, both files are identical and, therefore, MAPublisher treats both file types in the same manner. AutoCAD files consist of drawing settings and configurations, as well as a series of entities, or graphic elements, organized into layers. MAPublisher provides broad support for many AutoCAD entity types and options.

Multi-feature imports are automatically sorted by feature type. AutoCAD files are imported with text layers first, point layers second, line layers third, and area layers fourth in the layer hierarchy.

ESRI ArcInfo Export (*.e00)
Import and Export

ArcInfo Export files are created by ESRI's ArcInfo product. A single E00 file describes a complete ArcInfo coverage. The file itself is actually an archive of several smaller files, or sub files, which will have fixed names and follow a predefined data format. MAPublisher will reproduce these sub files as distinct Illustrator layers on import. Therefore importing a single e00 import can result in the generation of point, area, line and text layers.

Multi-feature imports are automatically sorted by feature type. ArcInfo Export files are imported with text layers first, point layers second, line layers third, and area layers fourth in the layer hierarchy.

ESRI ArcInfo Generate (*.gen)
Import and Export

ArcInfo Generate files are created by ESRI's ArcInfo product, and have a simple ASCII 'from x-y to x-y' format. Due to its simplicity you can also use a text editor such as Notepad to create text files and save them with a *.gen extension, which can then be imported with MAPublisher.

ESRI Shapefile (*.shp)
Import and Export

Shapefiles are most commonly created by ESRI's ArcView product although other products, including MAPublisher, are capable of generating files in this format. Shapefiles store both geometry and attributes for features, and a single shapefile will consist of at least three physical files. The .shp portion contains the geometric data, the .dbf contains attributes for the geometric data, and the .shx contains the index information. All three files are required in order to successfully import a shapefile to Adobe Illustrator using MAPublisher. There is also usually a .prj file, which holds the projection information of the shapefile and will automatically be read by MAPublisher on import. If your shapefile folder does not contain a .prj file you will be required to specify the projection in order to fully utilize MAPublisher. The important things to remember when importing shapefiles are that the .shp file must be the one that is selected through the MAPublisher import filter and that all its component files must be in the same folder. You may also find that your shapefile directory comes with two extra files, a .sbn and a .sbx, which hold the spatial index for the geometric data. These two files will not exist unless the shapefile was created with an ESRI product, and are not necessary for successful import with MAPublisher.

MapInfo Interchange (*.mif/*.mid)
Import and Export

Files of this type are most commonly created by the MapInfo product, though other products, including MAPublisher, are also capable of generating files in this format. These files exist in pairs where each file has the same name but ends in either a .mif or .mid. file extension. The .mif portion contains the vector geometric data, and the .mid contains the associated attributes. Both files are required in order to successfully import a file of this format to Adobe Illustrator using MAPublisher. The important things to remember when importing MapInfo files are that the .mif file must be the one that is selected through the MAPublisher import filter and that both files must be in the same folder. MAPublisher will automatically locate and deal with the .mid file.

MapInfo Table (*.tab)
Import and Export

The TAB format is a simple, non-topological format for storing the geometric location and attribute information of geographic features, and is an integral part of the MapInfo product. The TAB format defines the geometry and attributes of geographically-referenced features in several files with specific file extensions that are stored in the same folder on disk. They are:
.tab – main file: table structure in ASCII format.
.map - the file that stores the feature geometry.
.id - the file that stores the index of the feature geometry.
.dat - the dBASE file that stores the attribute information of features.
.ind - table field indexes (if necessary)
The geometry of each feature is stored as a shape that comprises a set of vector coordinates. The attributes for each feature are stored as a record in a dBASE table (.dat) associated with the shapefile (.map). There is one record in the dBASE table for each feature in the map file.
To ensure successful import, select the .tab component in the MAPublisher importers.

Microstation Design (*.dgn)
Import and Export

Microstation Design files (.dgn) are the native files created by Bentley Systems Inc's (and formerly Intergraph's) Microstation product. Design Files consist of a header, followed by a series of elements. The header contains global information including the transformation equation from design units to user coordinates, as well as the dimension of the elements in the file. Each element contains standard display information, such as its colour, level, class, and style, as well as a number of attributes specific to its element type.

During the import process MAPublisher will reproduce .dgn 'levels' as distinct Illustrator layers. Therefore a typical single import will produce one layer for each Level that exists in the Microstation Design File.

MAPublisher supports the import of Microstation J (version 7) and V8 files. Files are exported to DGN from MAPublisher as Microstation J files.

Multi-feature imports are automatically sorted by feature type. Microstation files are imported with text layers first, point layers second, line layers third, and area layers fourth in the layer hierarchy.

TIGER/Line (*.rt1) (*.bw1)
Import only

'TIGER' is an abbreviation of 'Topologically Integrated Geographic Encoding and Reference System', and was developed by the U.S. Census Bureau. TIGER/Line files are a digital database of geographic features, such as roads, railroads, rivers, lakes, political boundaries, census statistical boundaries, etc., that cover the entire United States. The database contains information about these features such as their location in latitude and longitude, the name, the type of feature, address ranges for most streets, the geographic relationship to other features, and other related information. TIGER/Line files are the public product created from the Census Bureau's TIGER database of geographic formation. TIGER was developed in order to support the mapping and related geographic activities required by the census and sample survey programs. More information on the TIGER/Line file format and data product can be found on the U.S. Census web page at: *http://www.census.gov/geo/www/tiger/*

MAPublisher considers the .rt1 or .bw1 file as the Tiger dataset. Even though each county will consist of a series of files with a common base name, there may be a number of different extensions. Remember to select the .rt1 or .bw1 file when importing Tiger data.

USGS Digital Line Graph (*.dlg) (*.opt)
Import only

The United States Geological Survey's DLG file structure is designed to accommodate categories of spatial data represented on a conventional line map. Node (point), line, and area data types are accepted. The attribute coding scheme is designed to accommodate basic cartographic data categories such as hypsography, hydrography, or political and cultural features, as well as additional thematic data categories.

USGS SDTS (*catd.ddf)
Import only

Digital cartographic products of the USGS are available in the Spatial Data Transfer Standard format, and are generally distributed over the Internet as a means of promoting the standard. For SDTS import, select the 'catd' file (xxxxcatd.ddf), which is the index file that contains a description of the other files in the SDTS transfer. Individual DDF files cannot be imported. Generally all SDTS downloads will contain the CATD file.

ASCII Point (*.txt) (*.csv) (*.dat)
Import only

MAPublisher also supports the import of ASCII data held in a variety of tabular file formats, as long as the data contains coordinate values. File types supported are Text (.txt), Data (.dat) and Comma Separated (.csv) files.

Import Settings dialog: In order to import point data with MAPublisher you must set parameters by clicking the 'Settings' button. This operation is required to choose the columns of the selected attribute file that will be used to derive the X and Y coordinates of the data, and ensure correct georeferencing. These and further settings will be discussed in the ASCII Point Data Settings section on page 27.

DATA CONSIDERATIONS

When obtaining GIS data for use with MAPublisher, whether from an online source, commercial vendor, government office or from an internal source within your organization, there are a number of important considerations to keep in mind.

First and foremost you should always endeavour to obtain data in one of the formats supported by the MAPublisher Importers (see pages 20-22). In cases where the file format native to a particular mapping application is not supported by MAPublisher, you can often request the data provider to export a file in one of the supported formats.

When obtaining data you should acquire as much meta-data about the files as possible. MAPublisher deals with data in the following manner: Unprojected data will be imported by MAPublisher with latitude and longitude map anchors, which will therefore range from (x) -180 to 180, (y) -90 to 90. Unprojected data will also import with a non-earth scale.

If you receive projected data you should be aware of the following. MAPublisher will import projected data with a true scale and appropriate map anchors. Unlike unprojected data, these map anchors will not be in lat/long, but rather in a coordinate system appropriate for the particular projection. For most file formats the name of the projection, datum, and units will be recognized by MAPublisher. However if the program cannot find this information in the data, and you wish to subsequently reproject your data, you will be required to specify the coordinate system.

Additionally, please be aware that MAPublisher is a 2D mapping program. Therefore if you attempt to import 3D data with MAPublisher it will be converted to two dimensional artwork by the importers.

Chapter 3
Importing Map Data

The Import filters are the main starting point for most users wanting to work with GIS map data in Adobe Illustrator. These are the filters that must be used to import GIS data files, set the initial map scale and define your cartographic workspace to start making maps.

MAPublisher supports the Import of the following GIS data formats:
AutoCAD (*.dxf) (*.dwg)
ESRI ArcInfo Export (*.e00)
ESRI ArcInfo Generate (*.gen)
ESRI Shapefile (*.shp)
MapInfo Interchange (*.mif / *.mid)
MapInfo Table (*.tab)
Microstation (*.dgn)
TIGER/Line (*.rt1) (*.bw1)
USGS Digital Line Graph (*.dlg) (*.opt)
USGS SDTS (*.ddf)
ASCII Point (*.txt) (*.csv) (*.dat)
See pages 20 to 22 for a description of these formats.

There are two Import filters available, which will be discussed in detail in this section:

Simple Import: This filter is designed to provide a fast way to import one file, or several files of the same data format and projection, into Adobe Illustrator.

Advanced Import: This filter provides functionality to import a number of files of differing data type and/or projections into Adobe Illustrator.

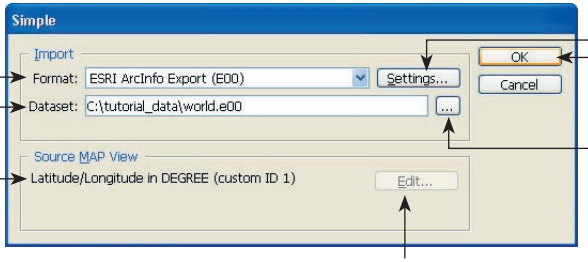
Simple Import

File > Import Map Data > Simple

Format *- Select the data type you wish to import. This dropdown lists the names of all MAPublisher supported data types.*

Dataset *- Displays the directory path and filename for the currently selected file(s). You can also manually type in the dataset location here.*

Source MAP View *- Provides a description of the coordinate system and units detected in the data source.*



Settings *- Opens a* **Settings** *dialog if the file format requires the input of extra parameters, such as for the import of DGN, DXF, DWG, E00 and ASCII Point Data (see facing page).*

OK *- Clicking this button will import the selected file(s) into Illustrator.*

Browse *- Opens a Data Source browser to enable the selection of files for import.*

Edit *- If the coordinate system of the selected file(s) is known, but it was not automatically generated by the program, click here. This will open the* **Source Projection** *dialog (below).*

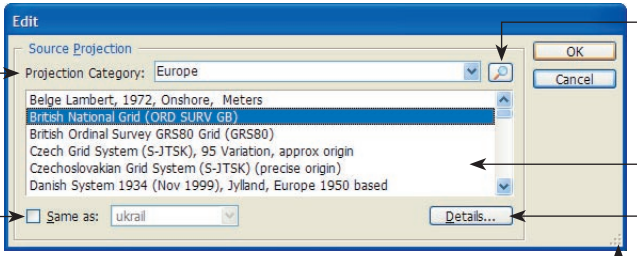
Related Tools

Source Projection

This dialog will automatically open after clicking the ***Edit*** *button.*

Projection Category *- Choose a category from this dropdown appropriate to the data to be imported. For all the projections in the database select 'All Projections'. For a list of the last 20 projections used, select 'Recently Used'.*

Same as *- Check this option in order to assign a projection that matches that of an existing MAP View.*



Search Projection *- Click this button to open the* **Search Projection** *dialog (Page 49), enabling you to search for projections by specifying a text string. Results of the search are displayed in the 'Search Results' category.*

Projection List *- Choose the known projection from this list.*

Details *- View the parameters of a selected projection.*

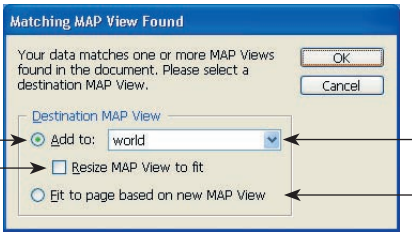
Resize *- Drag the lower right corner of the palette down to expand the Projection List.*

Matching MAP View

This dialog will automatically open if there is already a coordinate system in your document which matches the incoming data.

Add to *- Add the incoming data file to a matching MAP View in MAPublisher.*

Resize MAP View to fit *- Check this box to rescale the matching data so that both the selected layer and the incoming data fit inside the page extents.*



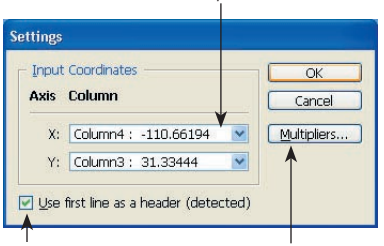
MAP View dropdown *- Select the matching coordinate system that you wish to align the incoming data to.*

Fit to page based on new MAP View *- Both the matching coordinate system and incoming data will be treated separately in terms of page scaling.*

Import Settings

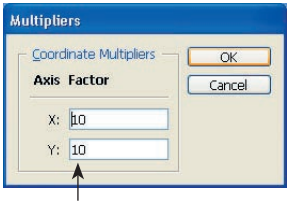
ASCII Point Data Settings

X/Y Columns *- These two dropdown lists hold the names of all the numeric columns in the selected file. Select the columns from which the X coordinates and the Y coordinates for each point will be read.*



Use first line as a header *- If the first line of the text file you are importing contains column headings, check this box.*

Multipliers *- Click this button to open the* ***Multipliers*** *dialog.*



Multiply coordinates X/Y *- You may enter a value by which all X values and, or, all Y values for each point will be multiplied by before they are imported.*

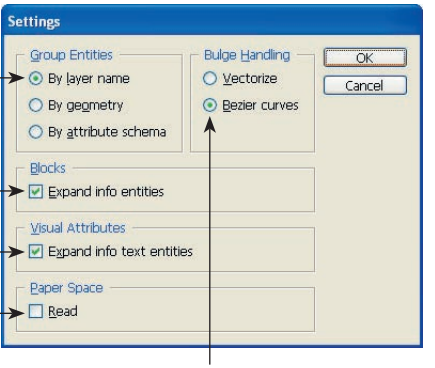
AutoCAD DXF/DWG Settings

Group Entities By *- Group entities by layer Name, geometry or build AutoCAD schema by scanning extended entity data.*

Blocks *- Check this box if you want to explode blocks and return the entities that form the components of the block as separate features.*

Visual Attributes *- Check this box if you want each visible attribute to be returned as a single text feature.*

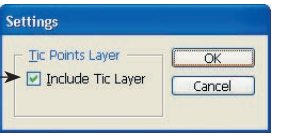
Paper Space *- Setting to 'Read' will instruct MAPublisher to also read the entities from paper space. By default, MAPublisher will only read the entities from model space.*



Bulge Handling *- Determines how AutoCAD curves are handled on import. By default, the arcs are approximated by splitting them into a series of connected segments (vectorized). In rare cases when the number of points on the map becomes a critical consideration, an approximation with smooth Bezier curves can be specified.*

ESRI ArcInfo Export Settings

Enable *- Specify if you require the creation of a layer holding the registration control points. If you enable this option an extra layer will be created appended with '_tic_point'.*



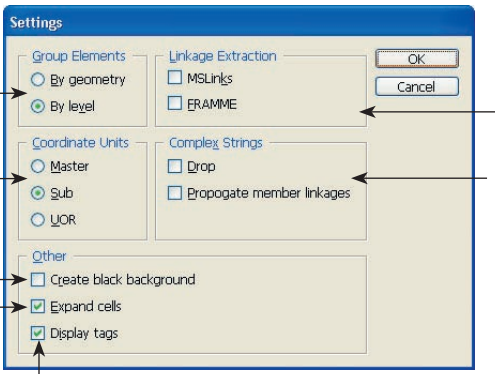
Microstation Design Settings

Group Elements *- Choose how you want to group the elements. If you group the elements by level, it may result in a large number of output files.*

Coordinate Units *- Specifies how feature coordinates will be interpreted and converted.*

Create black background *- Check this option to incorporate a layer containing a black background, to mimic the Microstation environment.*

Expand cells *- Check this box if you want the cells expanded into separate features.*



Display tags *- Check this box to display tags. Elements in a design file may have user-defined attributes (tags) attached to them which can be read by MAPublisher.*

Linkage Extraction *- Linkage Extraction boxes allows you to extract MSLinks and/or FRAMME attribute linkage values from the Source Design File. Only the first three linkage values will be extracted.*

Complex Strings *- Check 'Drop' if you want each component of a complex chain to be returned as its own feature. Otherwise all elements of the complex chain will be merged into a single linear feature. Check 'Propagate Member Linkages' if you want the linkages attached to the first component of the complex chain to be returned on the MAPublisher feature, supplementing any existing linkages.*

SIMPLE IMPORT FUNCTIONALITY

The Simple Import dialog provides a fast, uncomplicated method of importing map data into Adobe Illustrator. Its focus is for the mapmaker who has a single piece of map data, or several smaller files comprising one dataset of the same format and projection, that they wish to simply import quickly.

PREREQUISITES

In order to import data via Simple Import, you must first set up your Illustrator document. Plan for the data that you will subsequently bring in, and set up your Illustrator document accordingly. For instance a map of the world would fit well into a page with a Landscape orientation, whereas a map of South America would fit best into a page with a Portrait orientation. Also plan for the output of the map document if necessary, to ensure that your page dimensions are close to the required size that the document will be printed. It is far easier to set up the page before the map data has been imported, as MAPublisher will interpret these dimensions in the Importer, and calculate a map scale for your document accordingly. If you do edit the size of your document, remember to reset your rulers before opening either Importer in order for MAPublisher to correctly fit the data into the page extents.

Once your page has been set up you can access the MAPublisher Simple Import dialog under the File menu, at the Import Map Data pullout.

USING SIMPLE IMPORT

DIALOG OVERVIEW

The dialog itself is split into two sections. The upper section allows you to choose a file format, select the file you wish to import, and enter any additional settings that may be required. The lower section will display the coordinate system of the selected file and allow you to specify this manually if the program has not detected a projection.

ADDING FILES

In order to select a file or files for import you can either leave the ***Format*** dropdown Blank, or set the dropdown to the file type you wish to import. If this dropdown is left with no selection when you search for your GIS file to open, ALL files will be displayed. It is often easier therefore to set the ***Format*** dropdown at the required format to ease navigation and file selection.

When you have chosen the format, click the ***Browse*** button to select your file(s) and then click ***Open***. Alternatively you can type in the full path of the file(s) in the ***Dataset*** field. *Note that the import of multiple of ASCII Point files is not supported.*

SOURCE MAP VIEW

Once the Dataset field has been populated with a valid path, the program will read the file(s) to determine the coordinate system and display this in the ***Source MAP View*** section (see MAP Views on pages 45 to 53).

If the program returns the message *'<not detected>'* for the coordinate system, you may click the ***Edit*** button to specify it (MAPublisher will read the projection automatically if the file format supports projection information). In the ***Source Projection*** dialog, projections are separated into Projection category to ease the process of choosing a

projection. ***All Projections*** will list all the projections in the database. If you wish to view the parameters of a certain projection, you can click the ***Details*** button to view them. You can also assign a projection based on an existing MAP View in your document by using the ***Same as*** dropdown. For an overview of Projections and Datums see pages A1/27 to A1/31.

FORMAT SPECIFIC SETTINGS

Certain file formats will offer additional configuration parameters which can be accessed by clicking the ***Settings*** button. These file formats are ***ArcInfo Export***, ***AutoCAD DWG/DXF***, ***Microstation DGN***, and ***ASCII Point Data****. Select your file(s) first. If the format accepts additional settings the Settings button will be enabled. Study the Import Settings guide (page 27) for an overview of the meanings of these options.
**Note that only for the import of ASCII Point Data are additional Settings mandatory.*

ASCII POINT DATA SETTINGS

MAPublisher also allows for the import of delimited ASCII text files as point data provided they contain coordinate values. MAPublisher 6 supports the import of delimited ASCII files that contain any of the following delimiters between data values: comma, return, end of line and tab.

To import ASCII data, you must choose the ***Columns*** to use for your X & Y coordinates from the two dropdowns. Note that only numerical columns will be listed to ease the process of determining the columns to use. If the first line of the text file you are importing contains column headings, check the ***Use first line as a header*** checkbox, though MAPublisher will generally automatically detect if this is the case. If the file does not appear to contain column headers, MAPublisher will assign the default headers "Column1", "Column2" to the attribute columns on import.

You may also choose to multiply your coordinate values by a specified value. For example if a Point has a coordinate value of 2.5 by 6.2, entering a Multiplication value of 10 would result in its coordinate being 25 by 62 after import. To enter such values, click the ***Multiply*** button and enter your values into the X and Y fields.

IMPORTING DATA

When you have your file(s) selected, and if necessary specified the coordinate system and/or extra settings, you can click ***OK*** to import.

If MAPublisher finds there is a coordinate system already in your document which matches the incoming data, the ***Matching MAP View*** dialog will open (see MAP Views, on page 45). If this dialog opens you must choose to either add the incoming data file to a specified MAP View, or create a new MAP View to hold the incoming data.

1. If you specify ***Add to***, choose the ***MAP View*** from the listbox to add your incoming data to. This option will also allow you to rescale the existing and incoming data which will comprise this MAP View in order to fit them all inside the page extents. To achieve rescaling, check the ***Resize MAP View to fit*** option. If you do not check this option, some of your data may be imported outside of the page extents.
2. If you specify ***Fit to page based on new MAP View***, the incoming data will be treated separately from the matching data, as if it was the first import.

RESULTS

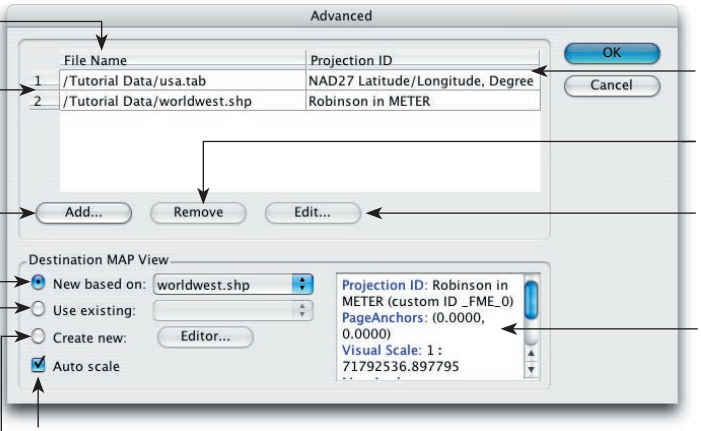
The data will be imported into Adobe Illustrator, and will be generated as Illustrator layers, one for each feature type in the import. The name of these layers will be a direct reproduction of the name(s) of the imported data. For instance importing a single polygon file named *world.mif* would produce a single Illustrator layer called *world_area*, which contains the imported file. Furthermore this layer can be seen as part of a MAP View, where Illustrator layers are automatically placed as sub features of specific coordinate systems.

SIMPLE IMPORT TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
3-i ... Importing a Single Map File
3-ii ... Importing Multiple Map Files at Once
3-iii ... Importing Map Files to Match an Existing Layer
3-iv ... Importing Map Files with Auto-Grain
3-v ... Importing GIS Formats that Require Optional Settings
3-vi ... Importing Points

Advanced Import

File > Import Map Data > Advanced



File Name *- The directory path of the map file(s) to be imported.*

File Numbers *- Allows the selection of individual files in order to activate the Edit and Remove buttons.*

Add *- Allows the selection of files for import by opening the* **Advanced Import Data Source** *dialog (below).*

New based on *- Allows you to import all of the files in a projection contained in a file in the File List.*

Use existing *- Allows you to import all of the files in a projection that already exists in a MAP View in the document.*

Create new *- Allows you to import all of the files in a new projection. Clicking the 'Editor' button opens the* **MAP View Editor** *(see page 51).*

Auto scale *- If you have multiple files in the File List, and have selected the 'New Based On' option, check this box to ensure all the files fit inside the page extents when imported.*

File List *- This is a table where all files selected for import are listed.*

Remove *- Allows removal of selected files from the list.*

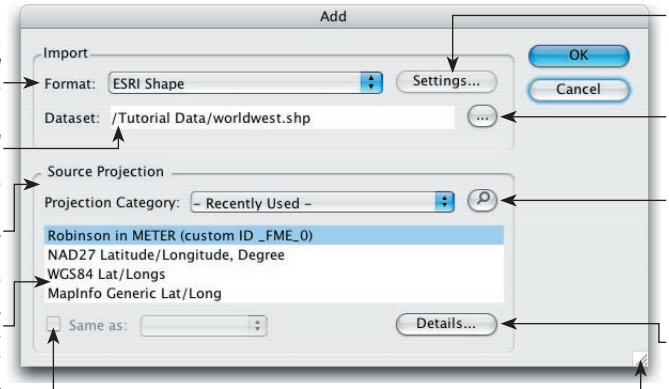
Edit *- Allows the Edit of the selected file by re-opening the* **Advanced Import Data Source** *dialog (see below).*

Details *- Displays details of currently selected file: Coordinate System, Unit, Page Anchors, Scale, Map Anchors and Rotation.*

Related Tools

Advanced Import Data Source dialog

This dialog will automatically open after clicking the ***Add*** *or* ***Edit*** *button.*



Format *- Select the data type you wish to import. This dropdown lists all MAPublisher supported data types.*

Dataset *- Displays the directory path and filename for the currently selected file(s). You can also manually type in the dataset location here.*

Source Projection *- This section allows the manual selection of the coordinate system if this information is not held in the data source.*

Projection List *- A list of the projections available for selection, based on the choice of Category.*

Same as *- Check this option in order to assign a projection that matches that of an existing MAP View.*

Settings *- Opens a* **Settings** *dialog if the file format requires the input of extra parameters, such as for the import of DGN, DXF, DWG, E00 and ASCII Point Data (see page 27).*

Browse *- Opens a Data Source browser to enable the selection of files for import.*

Search Projection *- Click this button to open the* **Search Projection** *dialog (Page 51), enabling you to search for projections by specifying a text string. Results of the search are displayed in the 'Search Results' category.*

Details *- Click this button to view the parameters of a selected projection.*

Resize *- Drag the lower right corner to expand the Projection List.*

Import Settings

See page 27.

ADVANCED IMPORT FUNCTIONALITY

Advanced Import provides an alternative method of importing map data into Adobe Illustrator. Its focus is for the mapmaker who has a collection of map data, that they wish to import into Adobe Illustrator at the same time. This function can deal with import of multiple formats and varying projections, with the dialog providing a list of files flagged for import.

PREREQUISITES

In order to import data via Advanced Import, you must first set up your Illustrator document. Please see the guidelines for setting up your page that are included in Using Simple Import (page 28)

Once your page has been set up you can open MAPublisher Advanced Import. This is located under the File menu, at the Import Map Data pullout.

USING ADVANCED IMPORT

DIALOG OVERVIEW

The dialog itself is comprised of a list box for the display of currently selected files; buttons to Add, Remove, or Edit files for Import; and a section for the specification of an output projection, whether this be a projection contained in one of the files in the list, a projection in the current document, or a new user specified projection.

ADDING FILES

In order to select a file or files for import first click the ***Add*** button. In the ***Advanced Import Data Source*** dialog you can either leave the ***Format*** dropdown blank or set the dropdown to the file type you wish to import. If this dropdown is left with no selection, when you search for your GIS file to open ALL files will be displayed. It is often easier therefore to set the Format dropdown at the required format to ease navigation.

When you have chosen the format, click the ***Browse*** button to select your file(s) and then click ***Open*** (only one file format can be opened from this Open dialog). Alternatively you can enter the path of the file(s) in the ***Dataset*** field. *Note that the import of multiple of ASCII Point files is not supported.*

SOURCE PROJECTION

If you are aware that your selected files do not contain Coordinate System information, you can either specify it within the ***Advanced Import Data Source*** dialog, or you can assign a projection based on an existing MAP View in your document by using the Same As dropdown. Additionally if you wish to view the parameters of a certain listed projection, you can click the ***Details*** button to view them. For an overview of Projections and Datums see pages A1/27 to A1/31. Generally most users should ignore the ***Known Projection*** section when choosing the Import files, as the program will read the projection automatically if the file format supports projection information. You can always return to this dialog later to edit the choices you have made.

FORMAT SPECIFIC SETTINGS

Certain file formats will offer additional configuration parameters which can be accessed by clicking the ***Settings*** button. These file formats are ***ArcInfo Export***, ***AutoCAD DWG/DXF***, ***Microstation DGN***, and ***ASCII Point Data****. Select your file(s) first. If the format accepts additional settings the Settings button will be enabled. Study the Import Settings guide (page 27) for an overview of the meanings of these options.
**Note that only for the import of ASCII Point Data are additional Settings mandatory.*

ASCII POINT DATA SETTINGS

MAPublisher also allows for the import of delimited ASCII text files as point data provided they contain coordinate values. MAPublisher 6 supports the import of delimited ASCII files that contain any of the following delimiters between data values: comma, return, end of line and tab.

To import ASCII data, you must choose the ***Columns*** to use for your X & Y coordinates from the two dropdowns. Note that only numerical columns will be listed to ease the process of determining the columns to use. If the first line of the text file you are importing contains column headings, check the ***Use first line as a header*** checkbox, though MAPublisher will generally automatically detect if this is the case. If the file does not appear to contain column headers, MAPublisher will assign the default headers "Column1", "Column2" to the attribute columns on import.

You may also choose to multiply your coordinate values by a specified value. For example if a Point has a coordinate value of 2.5 by 6.2, entering a Multiplication value of 10 would result in its coordinate being 25 by 62 after import. To enter such values, click the ***Multiply*** button and enter your values into the X and Y fields.

ADVANCED IMPORT FILE LIST

Once the ***Dataset*** field has been populated with a valid path and you have clicked OK, the program will close the ***Advanced Import Data Source*** dialog and either read the selected file(s) to determine the coordinate system, or attach your specified projection to the files. The file(s) will now be listed in the ***Advanced Import*** dialog.

You can now add more files to this list (for instance adding the next file format) by re-clicking the ***Add*** button and proceeding in the same manner as specified above.

There are two columns present in the Advanced Import list. The first will display the full path of each file, and the second will display the projection that has either been automatically read by the program or assigned manually. Each file added to the Import list will have a row number that can be clicked in order to select it. This function will allow you to remove a selected file from the Import list; or edit a selected file. Therefore to remove a selected file or number of selected files from the Import list click the ***Remove*** button.

EDITING COORDINATE SYSTEMS PRIOR TO IMPORT

If the program displays ***Unknown Projection*** for the Coordinate System of a file, you may select the row and click the ***Edit*** button to specify it by returning you to the ***Advanced Import Data Source*** dialog.

Note that you can only import the listed files in a single projection, even though they may comprise of several. Therefore the ***Destination MAP View*** section holds the details of which projection the listed files will be imported in. The projection the file(s) will be imported in will be displayed in the panel in this section, and will show the ***Name*** of the Projection, its ***Map & Page Anchors***, ***Scale*** and ***Angle*** for the selected file. These settings will be discussed more in Attributes and Georeferencing on page 36.

You have three choices when deciding a ***Destination MAP View:***

1. You can choose to import all of the listed files in the projection and parameters that exists in one of the listed files. Click ***New based on*** and then select one of the files in the projection you require. If you have multiple files in the *File List,* you can check the ***Auto scale*** option to ensure that when the data is imported, it is scaled to fit the current page extents. If you do not check this option, some of your data may fall outside of the page extents during the import process.
2. You can choose to import all of the listed files in the projection and parameters that currently exists in the document (for example via a previous import). In this case select ***Use existing*** and then select the MAP View containing the desired projection.
3. Finally you can choose to assign another projection completely by first selecting the ***Create new*** option, and then clicking ***Editor***. This will open the ***MAP View Editor,*** allowing you to specify a projection from a projection list and make numerous page scaling edits. For an in depth look at this tool, see pages 51 to 53.

RESULTS

When you have your file(s) selected, and if necessary specified the coordinate system and/or extra settings, you can click ***OK*** to import. The data will be imported to Adobe Illustrator, and will be gathered as Illustrator layers, one for each feature type in the import. The name of these layers will be a direct reproduction of the name(s) of the imported data. For instance importing a polygon file named *county.mif* and a line file named *roads.shp*, would produce two Illustrator layers named *county_area* and *roads_line*, which contain the imported files. Furthermore these layers will be seen as part of a MAPublisher View, where the Illustrator layers will be automatically placed as sub features of a single coordinate system, being the singular coordinate system specified in the Destination MAP View section of the Advanced Import dialog.

ADVANCED IMPORT TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
3vii ... Importing Multiple File Types
3viii ... Importing Map Files in Multiple Projections
3ix ... Importing Map Files to Match an Existing Layer's Projection
3x ... Assigning a Projection Prior to Import
3xi ... Changing a Projection Prior to Import

Chapter 4

Attributes and Georeferencing

MAPublisher's ability to import GIS files into Illustrator while retaining both geographic vector and attribute information makes it very easy to produce high quality maps.

This section will explain the principles of georeferencing and attribute information and how these are maintained within MAPublisher. The following related tools will be examined:

MAP Location Tool
MAP Attributes
MAP Columns
Select by Attribute
Edit Column

Attributes & Georeferencing - Foreword

GEOREFERENCING

Georeferencing in MAPublisher is based in part on the relationship between ***Page Anchors*** and ***Map Anchors***. MAPublisher bases its georeferencing on a tie in point within Adobe Illustrator. During the import process, the software will treat the point at (0,0) in the document (Page Anchors) as being coincident to the lower left corner of the data in real world coordinates (Map Anchors). MAPublisher will use this anchor point in subsequent data transformations, such as rescaling and reprojecting, and will also be used in the creation of grids and to maintain georeferencing on export.

The most common way to set up an Illustrator page is to set the (0,0) point as being the coincident with the lower left corner of the document. When you open a new document in Illustrator, and choose to view the rulers, you will see that the point at (0,0) in document units is at this location. Therefore when MAPublisher imports a GIS file, it will place a lower left point with real world coordinates at this (0,0) point. Consequently a map of the world in Latitude/Longitude, imported into a new Illustrator document with the units set to inches, would produce a tie in point of X = 0", Y = 0" for the Page Anchors, and X = -180°, Y= -90° for the Map Anchors. From this point on these two points are dynamically linked. Note that in MAPublisher dialogs, Map Units are displayed in the coordinate system of the layer.

ATTRIBUTE INFORMATION

The attribute table that forms part of a GIS map file is one of the most important parts of any data set. It is in the attribute table that we find important information such as street names for lines, zoning or zip code numbers for areas and elevations for points to go along with our vector line, area or point data. Along with vector line, area and point data imported as explained in the previous sections, MAPublisher also imports the attribute data table associated with any vector map file that it supports.

During the import process MAPublisher will automatically generate extra attribute columns that relate to the feature type of the current Illustrator layer. For files that contain closed areas, MAPublisher will generate two extra columns on the '*_area*' layer, named '***MPArea***' and '***MPPerimeter***'. For files that contain line elements, MAPublisher will generate a single extra column named '***MPLength***'. These extra attribute columns will hold precise values for the elements in the units of the imported file and are displayed in the MAP Attribute window.

MAPublisher is able to use map attribute data to search for and select items, create and place labels, and create map legends based upon attribute values or value ranges. The software also provides tools and dialogs for accessing, viewing, editing and adding to map attribute tables.

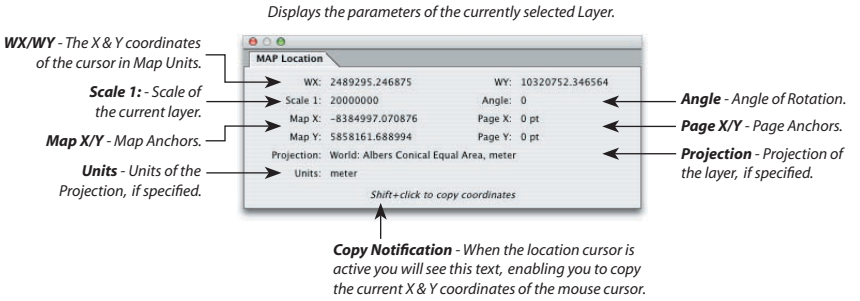
Important note regarding 'MPArea' values: Certain polygons may be displayed as negative areas in the '***MPArea***' column of the MAP Attribute window. Data that was originally digitized counterclockwise will contain negative values. If you are exporting areas to GIS formats you must check for negative values in this column prior to export. The MAPublisher *'Flip Selected Lines'* filter can be used to convert negative values into positive values. Please refer to the *Export* section (page 54) for further details.

MAP LAYERS

Throughout this guide, an ***Illustrator Layer*** containing georeferencing and/or attribute Information will be referred to as a ***MAP Layer***.

MAP Location Tool

Main Toolbar > MAP Location Tool  *or*
Window > MAPublisher Statistics > Location



FUNCTIONALITY

The MAPublisher Location Tool displays the coordinates of the mouse cursor in the ***Map Units*** of the currently selected Illustrator layer. When no map units are present (i.e. the layer has no georeferencing information) the window will display the coordinates in ***Page Units.*** The window will also display the ***Map*** *and* ***Page Anchors***, the ***Scale***, ***Angle*** of rotation, and the ***Projection*** and ***Units*** of the MAP Layer.

The MAP Location Tool also enables the X and Y position of the cursor in Map Units to be copied to the clipboard. An example of a use of this function is that it enables you to build point files in an external text editor; files which can then be re-imported with MAPublisher. Coordinates are copied with the X value first and Y value second, and are delimited by a comma. For example: -79.396527,43.631979

USING THE MAP LOCATION TOOL

To use the MAP Location Tool, click on the  icon in Illustrator's ***Main Toolbar***. With the cursor scroll around your map document, and note how the Map Units update with the location of the mouse. If you wish to stop the location values from updating in the ***MAP Location*** window as you move the mouse hold down the Apple key (Mac) or Ctrl key (Windows).

To copy the coordinates of a specific location, ensure you have the appropriate layer selected in the Illustrator Layers palette, and then with the location cursor determine the exact position you wish to copy. Then hold down the Shift key and click on the document. The X and Y position in Map Units will be copied to the clipboard. You can now paste the values into any text editor. Note that you can only copy one set of coordinates. When you shift-click again, the values copied previously will be overwritten.

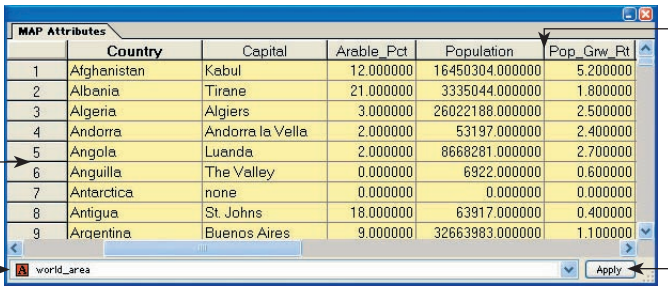
MAP LOCATION TOOL TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
4-i ... Determining the Coordinates of a Specific Location

MAP Attributes / MAP Columns

Window > MAPublisher Tables > MAP Attributes
Window > MAPublisher Tables > MAP Columns

MAP Attributes window



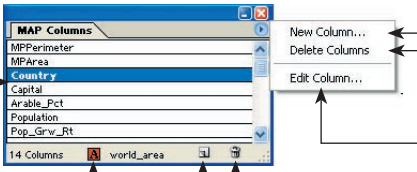
MAP Attributes *- This is the area in which the MAP Attributes are displayed.*

Layer Selection *- If data is selected on a number of layers, select the map layer containing the attributes you wish to view with this list.*

Click and drag to resize the columns.

Apply *- If you have made any changes to the attribute table, you must click here to apply them, otherwise any changes you made will be discarded when the window is closed.*

MAP Columns window



Column List *- List of columns that comprise the attribute table on the current selected layer.*

Layer Selection *- The name of the currently selected MAP Layer.*

New Column *- Click this button to begin adding a new column.*

Delete Columns *- Click this button to delete the currently selected column(s).*

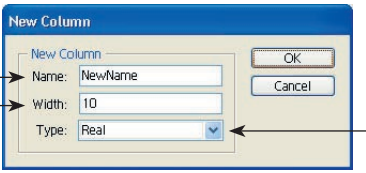
New Column *- Select this option to begin adding a new column.*

Delete Columns *- Select this option to delete the currently selected column(s).*

Edit Column *- Select this option to edit a selected column.*

New/Edit Column

*This dialog will open when clicking '**New Column**' or '**Edit Column**'.*



Name *- Specify or Edit the name of the column here.*

Width *- Specify or Edit a width in characters for the column.*

Type *- Specify the type of column* (Character, Integer, Real, Boolean) to create (* Can only specify when creating a new column).*

MAP ATTRIBUTES & MAP COLUMNS FUNCTIONALITY

The MAP Attributes window lets you display the attribute records for your map layer or for selected parts of it, which are linked to the map's graphic elements. Only the attributes of selected map features on a single layer will be displayed in the window at a given time. The MAP Columns window allows you to view, edit, create and delete map attribute columns on the currently selected layer. Any changes made will instantly update the ***MAP Attributes*** window.

USING THE MAP ATTRIBUTES WINDOW

If features are selected on multiple layers, you can toggle between these layers by choosing from the ***Layer*** dropdown. The attribute values displayed in the MAP Attributes window may be sorted according to column value by double-clicking on the column heading, and the widths of the columns may be changed by clicking on the column separator and dragging it as desired.

MAPublisher's MAP Attributes window is a fully editable spreadsheet environment. All attribute values, except those created by MAPublisher (***MPArea***, ***MPPerimeter***, ***MPLength***) can be edited. To change the value of a cell double-click on the cell and enter the new value such as you would in a spreadsheet program. Keep in mind that you must enter values that correspond with a column's type (i.e. only enter numbers into a column of type "Real" or "Integer"). After making the changes click the ***Apply*** button to set the edits permanently into the map file's database record. Closing the window without clicking ***Apply*** will discard any changes you have made.
Note: Mac users only - After making edits to cell values within the MAP Attributes window you should click in an alternate cell in the MAP Attributes window before clicking the ***Apply*** *button, otherwise the edits may not be recorded.*

USING THE MAP COLUMNS WINDOW

Imported files containing attributes will have up to four types of attribute columns, and these principals must be considered if you add columns to an attribute table using the ***New Column*** function:

Character columns can contain attributes that are both alpha and numeric.
Integer columns contain only whole numbers.
Real columns contain numbers carrying decimal values.
Boolean columns contain purely True or False values.

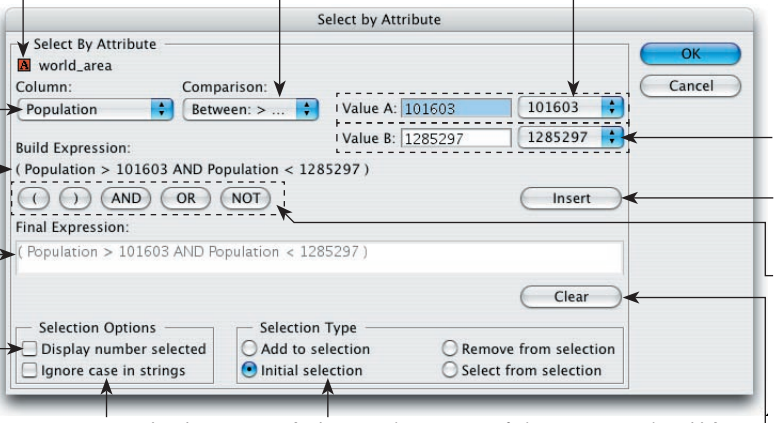
In terms of using MAPublisher to calculate values of new columns based on existing columns, or to use ranges of values in creating legends, only Real and Integer columns can be used for these purposes. Note that if you decide to edit the properties of a column via the ***Edit Column*** palette option, you will be unable to change the column type.

MAP ATTRIBUTES & MAP COLUMNS TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
4-ii ... Viewing and Editing MAP Attributes
4-iii ... Adding a New Column to a MAP Attribute Table
4-iv ... Changing a MAP Column's Properties

Select by Attribute

Filter > MAP Attributes > Select by Attribute



MAP Layer *- Displays the current map layer.*

Comparison *- A list of operators to help you build your expression - i.e. Equal to, Greater than, etc.*

Value A *- There are two parts to this parameter - a textbox and a dropdown list containing all unique values from the selected column. You can select a value from the list or enter one manually in the textbox.*

Value B *- These are only made available if the selected comparison is a "Between" type in which case the second value will be entered here.*

Column *- Select the column on which you wish to base your query.*

Build Expression *- Displays the current expression. This will update if you change the expression's parameters.*

Insert *- Moves the build expression into the Expression box.*

Final Expression *- After clicking Insert, the Build Expression is moved here. This is the final expression that will be assigned to the selected elements when you click OK.*

Boolean Operators *- You can use brackets, AND, OR and NOT operators to create a more complex expression involving multiple inserts of build expressions.*

Clear Expression *- Clears the expression box allowing you to insert a new expression.*

Display number selected *- When this option is enabled, the SelStats window will be opened after the query is made.*

Ignore case in strings *- If this is checked, any expression that compares string (non-numeric) values will be case insensitive.*

Selection Type *- There are 4 types of selections you can make - **Initial** (used when nothing is currently selected), **Add to** (used when you need to add to the current selection), **Remove from** (used when you need to remove features from the current selection), and **Select from** (where you limit the features being searched to those already selected).*

FUNCTIONALITY

The MAPublisher Select by Attribute filter allows you to select map features based upon their attribute information. A particular column is selected and then a logical expression is built defining the desired features for selection. For example, "Select all roads that have 2 lanes and are more than 5 kilometres long" is a kind of query you could make depending on the attribute data associated with your map layer.

USING SELECT BY ATTRIBUTE

To use Select by Attribute you must first click on the ***MAP Layer*** in the Illustrator Layers palette, which will determine the attribute table and feature type to be used for the operation.

In the Select by Attribute dialog you must select a ***Column*** of the attribute table, a ***Comparison,*** and a choice of ***Values***, in order to build an ***Expression***. Values can either be entered manually or by choosing from the dropdowns.

When the expression has been built you must click the ***Insert*** button. The ***Boolean Operator Buttons*** can be used if you wish to use multiple columns or values in order to generate an expression. If you make a mistake at any time, click the ***Clear Expression*** button.

This filter has 4 selection options:
Initial selection is used when there is no current selection.
Add to selection will add the results of the query to any currently selected features.
Remove from selection will remove the results of the query from the current selection.
Select from selection will only query those features that have already been selected.

Select by Attribute also has an option to ***Ignore case in strings***. If this option is checked, any expression that compares non-numeric values will not differentiate between characters in upper and lower case.

If you wish to open the ***SelStats*** window (see page 86) as part of the selection process in order to view the number of elements selected, tick the ***Display number selected*** checkbox

When the ***OK*** button is clicked, MAPublisher will select data based on the expression you have built.

SELECT BY ATTRIBUTE TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
4-vi ... Making a Selection with Select by Attribute
4-vii ... Using Select by Attribute to Add to an Existing Selection
4-viii ... Using Select by Attribute for Advanced Selections

Edit Column

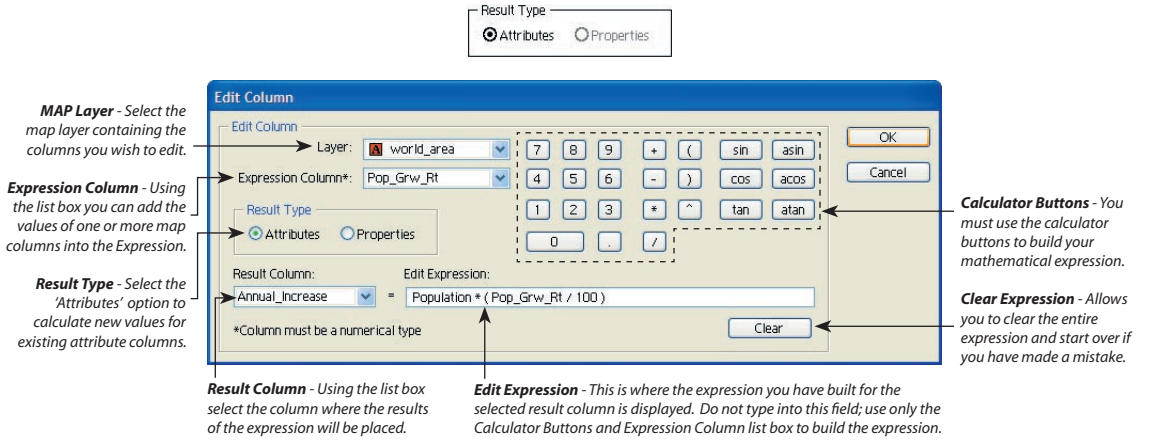
Filter > MAP Attributes > Edit Column

The Edit Column filter has two functionalities, based on the choice made in the *'Result Type'* section of the dialog.

Editing ***Attributes***: The filter provides for the editing of attributes for multiple features in a single step and for the creation of attribute values for a column based upon values in other columns.

Editing ***Properties***: Edit Column also provides for the editing of the rotation or scale of elements, based on the values found in an associated attribute column, providing a one-step process to possibly transform different objects by many hundreds of unique rotation or scale values.

Editing Attributes



'EDIT ATTRIBUTES' FUNCTIONALITY

The Edit Column filter can be used to populate a new column with values based upon calculations using existing columns. Editing attribute data using Edit Column is achieved by building an expression which accesses and manipulates values from other columns. The attributes of ***Area***, ***Line***, ***Point***, or ***Text*** layers can be edited with this filter, though only numeric columns can be used.

'EDIT ATTRIBUTES' PREREQUISITES

To use this filter for the editing of attributes, a new column must be created before running the Edit Column filter via the ***MAP Columns*** window. Only selected objects in the Illustrator document will have these calculations applied. Access the dialog by navigating to *Filter > MAP Attributes > Edit Column*.

You must first specify the ***Layer*** on which you need to calculate your new values. Then select the ***Attributes*** option in the *'Result Type'* section to use Edit Column for the calculation of new attributes.

USING EDIT COLUMN FOR EDITING ATTRIBUTES

This filter works like a scientific calculator. A ***Result Column*** must be set, which is normally the column you have just created to hold your results. Finally, the ***Expression Column*** dropdown and the ***Calculator Buttons*** are used to create the expression. Only the listboxes and calculator buttons in the Edit Column dialog should be used to build expressions, and not your keyboard. The Expression dropdown can be accessed more than once if you wish to use multiple columns to generate an expression. The expression you build will be displayed in the ***Edit Expression*** field. You can clear this at any stage by clicking the ***Clear Expression*** button.

When you have finalized your expression click the ***OK*** button. The new values will be displayed for the selected objects in the ***MAP Attributes*** window.

'EDIT ATTRIBUTES' TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
4-v ... Editing the Values of a MAP Column

'EDIT PROPERTIES' FUNCTIONALITY

Edit Column also provides for the assignment of a rotation or scale to elements, based on the values found in an associated attribute column. For example geological point files may contain such columns as 'Dip Direction', 'Inclination' etc. The values contained in these columns can be used to rotate or scale elements on such layers, providing a one-step process to possibly transform objects by many hundreds of unique rotation or scale values. Text objects can be rotated using this filter, and Point Symbols can be rotated or scaled. Therefore only P ***Point*** or T ***Text*** layers can be edited with this option, and only numeric columns can be used to assign transformations.

'EDIT PROPERTIES' PREREQUISITES

The Edit Column filter assigns rotations or scales to objects based upon calculations using existing columns. There must be at least one column which contains suitable values in the layer on which you wish to perform the transformations. Only selected objects in the Illustrator document will have these calculations applied.

Note that scaling can not be applied to points that already exist in a MAP Stylesheet. You must first remove the Point Layer from the Point Stylesheet.

Access the dialog by navigating to *Filter* > *MAP Attributes* > *Edit Column.*

You must first specify the Point or Text ***Layer*** on which you need to calculate your new rotation or scale values. Then select the ***Properties*** option in the *'Result Type'* section to use Edit Column for the calculation of new properties.

USING EDIT COLUMN FOR EDITING PROPERTIES

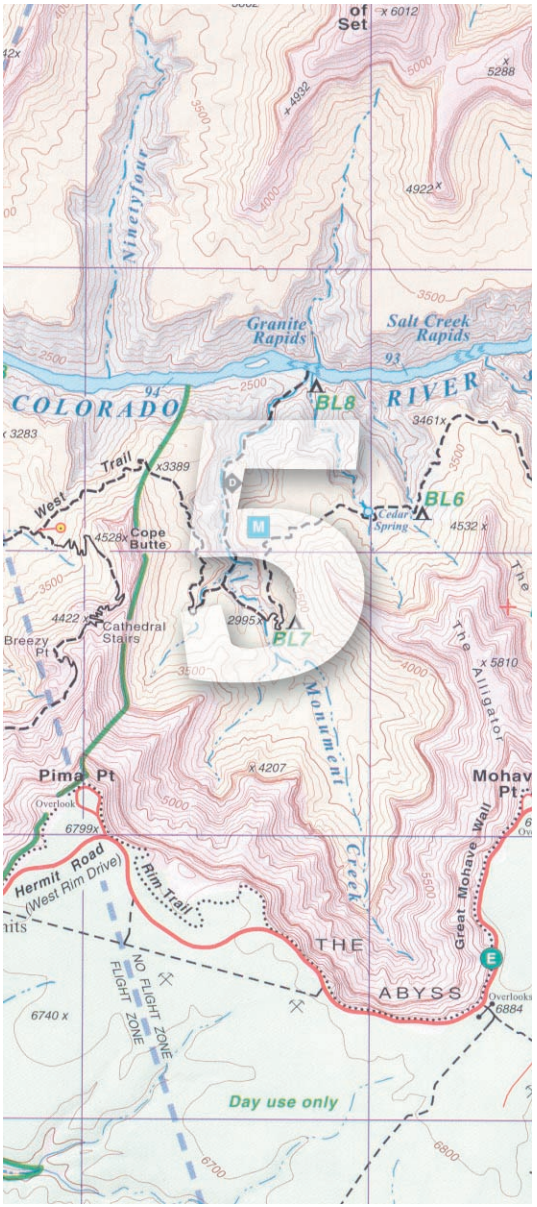
This filter works like a scientific calculator. You must first specify the ***Layer*** on which you need to apply your new properties. The '*Properties*' option will only be enabled when a P ***Point*** or T ***Text*** layer is selected.

A ***Result Property*** must be set, which is '*Rotation*' or '*Scale*' for Points, or '*Rotation*' only for text items. The ***Expression Column*** dropdown should be used to choose the column which contains your rotation or scale values. If you need to apply further numeric values to your expression, the ***Calculator Buttons*** can be used to add to the expression. Only the listboxes and calculator buttons in the Edit Column dialog should be used to build expressions, and not your keyboard. The Expression dropdown can be accessed more than once if you wish to use multiple columns to generate an expression. The expression you build will be displayed in the ***Edit Expression*** field. You can clear this at any stage by clicking the ***Clear Expression*** button.

When you have finalized your expression click the ***OK*** button. The new rotation or scale values will be applied to the selected objects. Note that scales will not be applied to points that already exist in a MAP Stylesheet.

The transformations that are applied are absolute values. The filter will only apply scales or rotations to objects based on their original orientation, and will not add to established scales or rotations.

Chapter 5
MAP Views



The MAP Views dialog is the hub from which you can access many additional MAPublisher features. The palette itself will display the Illustrator layers that exist in the current document as sub layers of distinct coordinate systems, or 'MAP Views'. From this palette you can specify projections for Illustrator layers, reproject data, edit scales and data placement, merge layers, and export to GIS formats.

During a standard Import process, an Illustrator layer will be created for each feature type automatically, and will be automatically appended with a *_point, _line, _area,* or *_text* suffix in the Illustrator layers palette. Certain file types will generate multiple layers, such as the levels found in DGN or DXF, but they will be similarly split up by feature type. A single import will furthermore produce a single MAPublisher View, as an import can only occur in a single projection. You may also create your own MAP Views in order to georeference existing Illustrator artwork.

The following pages will deal with the creation and management of MAP Views, specifying and changing a projection, editing scales and data placement on the page, merging Illustrator layers, and exporting to GIS formats, via the use of the following tools:

MAP Views palette
Search & Replace
Merge Layers
Source Projection
MAP View Editor
Export

MAP Views palette

Window> MAPublisher Palettes > MAP Views

MAP Views [M] - *List of the unique coordinate systems in the document.*

MAP Layers [A] [L] [P] [T] [O] - *An alphabetical list of the layers that comprise each MAP View, symbolised by feature type.*

Lock button - *Click this button to lock or unlock the Layer (mirrored in the Illustrator Layers palette).*

Non-map layers [/] - *Lists the Illustrator Layers that are not part of a specified MAP View, and do not contain georeferencing information.*

New MAP View button - *Allows you to create a New MAP View and specify its name and coordinate information.*

Delete MAP View button - *Allows you to delete the currently selected MAP View provided it does not contain any Illustrator layers.*

MAP View Options ...

New MAP View - *Allows you to create a New MAP View and specify its name and coordinate information.*

Duplicate MAP View - *Will create a Duplicate of the currently selected MAP View.*

Edit MAP View - *Allows you to edit the name and coordinate system of the currently selected MAP View.*

Delete MAP View - *Allows you to delete the currently selected MAP View provided it does not contain any Illustrator layers.*

Specify Anchors - *For manually establishing the 'tie-in' point between Map and Page Anchors (should only be used for new MAP Views or for the correction of georeferencing errors).*

Source Projection - *Allows you to specify the coordinate system of the currently selected MAP View.*

MAP Layer Options ...

Export Layer - *Enables the export of the selected MAP Layer to various GIS formats.*

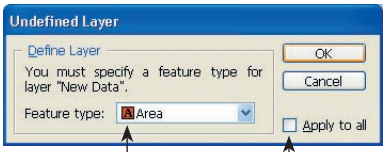
Merge Layers - *Allows the combining of two or more MAP Layers, as long as their attribute structures match. Ctrl select the layers in the MAP Views palette.*

Layer Name Search & Replace - *To search for text within layer names and specify an alternative. Useful for multi-layer imports.*

Related Tools

Undefined Layer dialog

This dialog will automatically open when dragging a 'Non-map layer' into a specified MAP View.

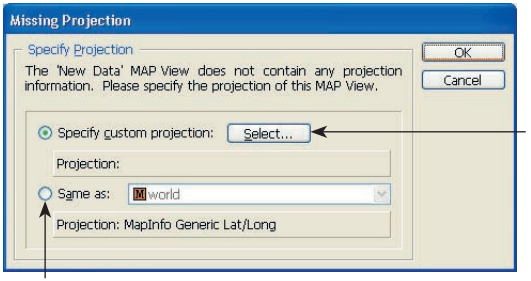


Feature type - *Select the type of feature that exists on the layer being dragged. This dropdown presents a choice of Area, Line, Point, Text, or Legend layer types.*

Apply to all - *If you are dragging a number of layers of the same feature type to a specified MAP View, you should check this box.*

Missing Projection dialog

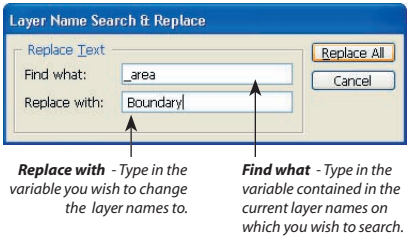
This dialog will automatically open when dragging a MAP Layer to an alternate MAP View, and either the source or destination MAP View has an unspecified coordinate system.



Specify custom projection - *Check this option and then click the Select button to specify the coordinate system of the named MAP View via the* **Source Projection** *dialog (page 50). Once selected, the Projection will be displayed below.*

Same as - *Check this option in order to assign a projection to the named MAP View that matches that of an existing MAP View. The projection of the selected MAP View will be displayed below.*

Layer Name Search & Replace



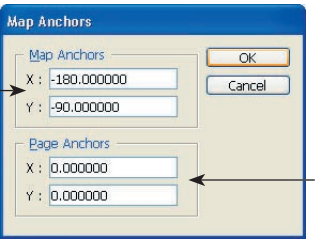
Replace with *- Type in the variable you wish to change the layer names to.*

Find what *- Type in the variable contained in the current layer names on which you wish to search.*

Specify Anchors

This dialog should only be accessed if you are creating a new MAP View, or you are correcting inaccurate georeferencing information. Caution: editing anchors can damage the accuracy of your data.

Map Anchors *- The location of the Map Anchors in the units of the current projection.*



Page Anchors *- The location of the Page Anchors in the units of the current document.*

OVERVIEW

The MAP Views palette is a new function in MAPublisher 6. In the list box will be entries for each defined coordinate system in the current document. All Illustrator layers will be shown in this palette as belonging to a certain MAP View, and at least one 'MAP View' will be created with each import. For Illustrator layers that do not have georeferencing information, these will be placed in the default MAP View entitled "Non-map layers".

MAP Views are symbolized in the following manner:

- MAP View containing georeferencing information
- Default category, which does not contain georeferencing information.
  This category is known as [Non-map layers].

Each Illustrator layer that belongs to a MAP View will be symbolized with an icon depicting its feature type:

Area layer	*(e.g. county boundaries, urban areas, country outlines etc.)*
Line layer	*(e.g. rivers, roads, railways)*
Point layer	*(e.g. town and city symbols, railway stations etc)*
Text layer	*(e.g. text labels)*
Legend layer	*(for MAPublisher Legend items: North Arrows, Scale Bars, Grids, and for the hosting of legend information for the MAPublisher Legend filters)*

FUNCTIONALITY

MAP Views are designed to provide an easy method of accessing dialogs for the specifying and changing of projections, for editing scales and data placement on the page, and for exporting to GIS formats. Within the MAP Views palette itself you are just a few clicks away from merging Illustrator layers, georeferencing existing Illustrator artwork, changing layer names in bulk, and reprojecting data on the fly.

USING THE MAP VIEWS PALETTE

REPROJECTING MAP LAYERS BY 'DRAG AND DROP'

Using the ***MAP View Editor*** will be discussed in detail later in this section. By using the MAP Views palette you can drag Illustrator layers from one MAP View to another, enabling you to reproject vector art* quickly. For instance two imports may produce two very different coordinate systems. In this case you can reproject without having to access a dialog, by simply dragging an Illustrator layer from one MAP View to another in the MAP Views palette. **Note that raster imagery can not be reprojected with MAPublisher.*

For example if you have two imported data layers, one in UTM Projection, and the other in Latitude/Longitude, MAPublisher will produce two distinct MAP Views, each holding the associated MAP Layer. If you wish to reproject the layer which is in UTM into Lat/Long, simply drag it from the UTM MAP View and drop it into the Lat/Long MAP View. MAPublisher will automatically reproject the layer to match the destination MAP View.
If you are reprojecting in this manner, and either the origin or destination MAP View does not contain a coordinate system, you will be presented with the ***Missing Projection*** dialog after you drag and drop. In essence both MAP Views must contain a coordinate system. Therefore this window will allow you to specify one of the following:

1. '*Specify custom projection*' allows you to specify the projection of the named MAP View, via the Source Projection function (see page 48)
2. *'Same as'* allows you to specify the projection of the named MAP View by choosing a coordinate system which already exists in a MAP View in your document.

Important note: Many transformations will inherently cause the loss of precision by the very nature of the complex mathematical calculations that must be performed. Additionally there are differences in precision between MAPublisher and Illustrator. MAPublisher's calculations are in 64 bit for accuracy, but the results still must be stored as 32 bit for Illustrator. As a result, please be aware that you may lose precision if you drag repeatedly from one coordinate system to another. When determining a coordinate system to use via the drag method, we strongly recommend you use *Edit > Undo* to revert coordinate systems until you find the appropriate system for your data.

LAYER NAME SEARCH & REPLACE

The MAP Views Options list also provides a ***Search and Replace*** function, enabling the quick change of names of multiple Illustrator layers. For example e00, dgn or AutoCAD imports may contain a large number of similar named layers. This option will allow you to quickly change the names of all layers that contain a specified variable.

MERGE LAYERS

This palette also provides a fast way of merging Illustrator layers. If you have more than one layer in a MAP View that contains the same attribute structure and data type, this option will allow you to merge them into a single layer. For example your data may have been received in segments, and you therefore find it occupying multiple layers in Illustrator. Simply ctrl-select these layers in the MAP Views palette and click the option for ***Merge Layers***. The layers will then be merged to provide a single layer holding your data and its associated attributes.

ASSIGNING GEOREFERENCING INFORMATION TO ILLUSTRATOR LAYERS

Illustrator layers that do not contain georeferencing or attribute information will also appear in this palette, under the default MAP View entitled ***Non-map layers***. Therefore these layers can be quickly moved into a specified MAP View with a matching coordinate system. When moving a 'non-map layer' into a specified MAP View you will be prompted to specify the feature type of the layer you are moving in the ***Undefined Layer*** dialog. This functionality allows you, for example, to manually trace features on a non-map layer and quickly assign georeferencing

information to the layer by dragging it to an existing MAP View. You can also select multiple layers and drag them to a specified map view by using the '***Apply to all***' function in the Undefined Layer dialog.

CREATING NEW LAYERS TO HOLD ADDITIONAL FEATURES

In order to plot points, generate text, use legends, or plot grids, scalebars and north arrows, you will first be required to create extra Illustrator layers to hold this information. This is due to the fact that layers cannot contain more than one feature type. Therefore prior to generating these additional map features, you need to first create a layer in the Illustrator layers palette on which these features will be held. Subsequently in the MAP Views palette you should drag these layers into the MAP View which contains the coordinate system you require to plot the extra features. The Feature Type you should specify for these features in the ***Undefined Layer*** dialog are as follows:


for **Text** items. ***Feature Text Label*** & ***MAP Tagger*** (pages 71-76) require you have a Text Layer for output.


for **Point** symbols. ***Point Plot*** (page 58) will not function without a Point Layer selected.


for **Legend** items. ***Assign Legend Info*** and ***Auto Assign Legend Info*** require that you place Legend criteria onto a Legend Layer. ***Grid Generator*** (page 78), ***Scale Bar*** (page 98) and ***North Arrow*** (page 100) require you have a Legend Layer selected before opening these tools.

DUPLICATING AND DELETING MAP VIEWS

MAP Views can be duplicated if you wish to make placement or projection edits to certain Illustrator layers, while leaving the others alone. This way you could drag the Illustrator layers you wish to edit into the Duplicate MAP View. Additionally MAP Views that do not contain any Illustrator layers can be deleted. Both of these tools can be accessed in the *Options* section of the MAP Views dialog. You can also delete a MAP View by clicking the ***Delete*** button at the base of the palette. Note that these functions act on MAP View parameters only, and not MAP Layers.

CREATING NEW MAP VIEWS

You are able to create new MAP Views by selecting ***New MAP View*** under the Options arrow., or by clicking the ***New*** button at the base of the palette. This will automatically open the ***MAP View Editor,*** which will be discussed in the MAP View Editor section (page 51), allowing you to set up a coordinate system, and enter values for scale, rotation, and page anchors. After you have created a new MAP View, you must use the ***Specify Anchors*** option from the MAP Views palette to define the tie-in point between Map Anchors and Page Anchors (see page 36). Note that you must enter Map Anchor values that are indicative of the unit of measurement used in the chosen coordinate system, which may mean these values are not in degrees or Lat/Longs.

REMOVING MAPUBLISHER INFORMATION

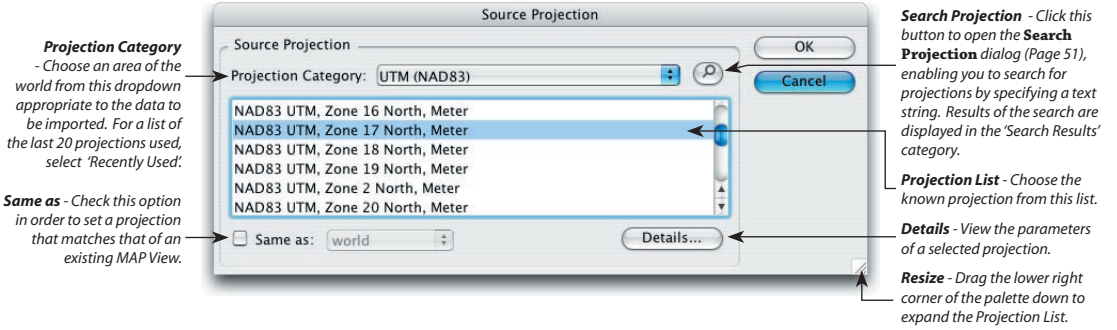
At the end of the project cycle it may be useful to permanently remove all georeferencing and attribute information in the current document. This can now be accomplished by simply dragging your MAP Layer(s) to the [Non-map layers] category in the MAP Views palette. ***Note that this function must only be used as a final step.***

MAP VIEWS PALETTE TUTORIALS

Please refer to the exercises *5-i to 5-vii* in the Tutorials PDF for the following topics:
"The Creation of MAP Views via Import", "Duplicating and Deleting MAP Views", "Reprojecting by Dragging MAP Layers into Alternate MAP Views", "Dragging a New Illustrator Layer into Similar Coordinate Systems", "Dragging New Illustrator Layers into Different Coordinate Systems", "Editing Layer Names Using Search and Replace", and "Merging MAP Layers".

Source Projection

MAP Views > Options > Source Projection, and
MAP View Editor > Source Projection



FUNCTIONALITY

There are three possible scenarios in which you would need to use this function:

1. If you imported a file even though the program returned a message of <not detected> for the Coordinate System during the import process.
2. If you had incorrectly specified the coordinate system during the Import process, and wish to remedy this.
3. If you have created a new MAP View and wish to assign a projection to it.

If you wish to maximize the functionality of MAPublisher, it is important that all of your MAP Views contain accurate projection information. For example, if you need to subsequently reproject your data, this will be impossible without first specifying an Input projection. If you do not know the projection of your data you must consult your data provider to obtain this information.

USING SOURCE PROJECTION

To specify a projection you must first select the appropriate MAP View in the MAP Views palette, and then select Source Projection located under the Options arrow in the upper right corner of the palette.

Projections are separated into ***Projection Category*** to ease the process of choosing a projection. *All Projections* will list all of the projections in the database. If you cannot find the projection you require, you can conduct a keyword search via the ***Search Projection*** function by clicking the icon (see page 53). If you wish to view the parameters of a certain projection, you can click the ***Details*** button to view them. For an overview of Projections and Datums see pages A1/27 to A1/31.

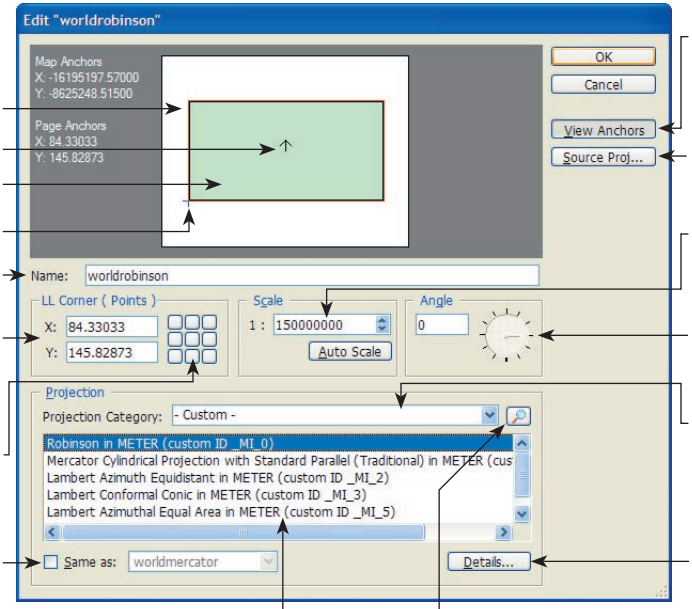
The Source Projection dialog also offers a checkbox to enable you to select a projection that already exists in the document. The ***Same as*** dropdown will allow you to select from a list of existing georeferenced MAP Views.

SOURCE PROJECTION TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
4-viii ... Specifying a Projection for an Imported File

MAP View Editor

MAP Views > Options > Edit,
MAP Views > Options > New MAP View, and
Advanced Import > Create New > Editor



Preview Pane *- Displays the data extents of the MAP View:*

White rectangle - page extents.

Arrow - current orientation of the MAP View.

Green rectangle - data extents.

Blue crosshair - location of the current Map & Page Anchors.

Name *- The editable name of the current MAP View.*

LL Corner *- The location of the lower left corner of the data in the units of the current document, which are editable.*

Alignment Control *- Click on the respective anchor point to set the Page Anchors to a graphically designated location.*

Same as *- Check this option in order to set a projection that matches that of an existing MAP View.*

View Anchors *- Click this button to view or hide the Map Anchors and Page Anchors in the Preview Pane.*

Source Projection *- If your MAP View does not currently contain a projection, click here to assign one. This will open the* **Source Projection** *dialog (see page 50).*

Scale *- The scale of the MAP View. Edit the scale manually or by using the Up and Down arrows to increase or decrease scale by one whole number. Click the 'Auto Scale' button to rescale the data to fit the page extents.*

Angle *- The rotation of the MAP View. Edit the angle manually or by using the 'clock hand' in the rotation control graphic.*

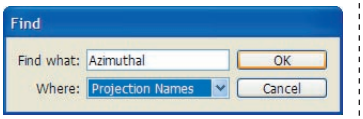
Projection Category *- To edit a projection choose an area of the world from this dropdown appropriate to the current MAP View. For a list of the last 20 projections used in the product, select 'Recently Used'.*

Details *- Click this button for the parameters of a selected projection.*

Projection List *- A list of the projections available for selection, based on the choice of Projection Category. The current projection is selected automatically.*

Search Projection *- Click this button to open the* **Search Projection** *dialog (right), enabling you to search for projections by specifying a text string. Results of the search are displayed in the 'Search Results' category.*

Search Projection



Find what *- Type in the text on which to search.*

Where *- Select the properties on which to perform the search ('All', 'Datums', 'Ellipsoids', 'Projection names/types', or 'Units').*

FUNCTIONALITY

The MAP View Editor can be accessed as part of the ***Advanced Import*** process (page 31) or from the ***MAP Views*** palette (page 46).

To access via the Advanced Import process, click the ***Create new*** radio button in the *Destination Coordinate System* section, and then click the ***Editor*** button to open the dialog.

From the ***MAP Views*** palette select the MAP View you wish to edit, and then select ***Edit*** under the *Options* arrow in the upper right corner of the palette. Conversely you can double click the MAP View to open the MAP View Editor.

The function has a variety of purposes. It will allow you to reproject data, transform scales, edit data positioning in the document, change rotation values, and rename MAP Views. Any or all of these functions can be achieved with a single visit to the MAP View Editor. There is also a preview pane where you can see how the edits made to data will affect its extents in the document.

USING THE MAP VIEW EDITOR

PREVIEW PANE

The Preview Pane symbolizes the data extents by a green rectangle, and the orientation with an arrow. You can click on this rectangle to move the data to a more suitable position in the document if you desire.

MAP VIEW NAME

When you open the dialog you will see the current name of the MAP View in the ***Name*** field, which you can edit if desired. Whether the MAP View Editor is accessed via Advanced Import, or from the MAP Views palette, editing the name here will change the name of the resultant or existing MAP View.

PAGE ANCHORS

Current Page Anchors are displayed in the ***LL*** (Lower Left) ***Corner X/Y*** fields, in the current document units. As discussed in the section on Georeferencing on page 36, the default Page Anchors are 0,0 in document units. Editing the Page Anchor values will move the data relative to the lower left location of the data. Entering negative values will move the data to the left or down, entering positive values will move the data to the right or up. There are also two graphical ways to edit Page Anchors. Firstly the data can be 'glued' to respective positions in the document by clicking on a respective Alignment Control button, of which there are nine positional options. Conversely dragging the green data preview rectangle around the page in the Preview Pane will update the Page Anchor values accordingly. Note that editing Page Anchors will not affect data integrity. It simply means that the lower left corner of the data in coordinate units (Map Anchors) is located at this new document position.

SCALE

The Scale of the current MAP View (or files to be imported) is shown in the ***Scale*** field. Generally, MAP Views carrying projected data (i.e. not in Lat/Long format) will carry real world scales. This field is editable allowing you to quickly specify an alternate scale. Furthermore the up and down buttons will allow you to fine tune scales by increasing or decreasing a scale by a single whole number. The ***Auto Scale*** button will allow you to quickly fit the data to the page extents if this is required. Clicking this button will edit the scale and page anchors so that it is located in the centre of document.

REPROJECTING

The MAP View Editor provides a fast and intuitive reprojection utility. Projections are separated into Projection categories, applicable to specific projection types or areas of the world, to ease the process of choosing a projection. The Projection list will show the projections that belong to the specified ***Projection Category. All Projections*** will list all of the projections in the database and if you choose this category, it may take some time to choose the one relevant to your MAP View. If you wish to view the parameters of a certain projection, you can click the ***Details*** button to view them. For an overview of Projections and Datums see pages A1/27 to A1/35.

The dialog also offers a checkbox to enable you to select a projection that already exists in the document. The ***Same as*** dropdown will allow you to select from a list of existing georeferenced MAP Views. This function is useful when a series of MAP Views exist of different areas, but even though they have different coordinate systems (i.e. position on the page), you require them all to be in the same projection. Again the ***Preview Pane*** will display the new data extents for any new projections specified in the MAP View Editor.

To match projections and coordinate systems across a number of MAP Views, simply drag the Illustrator layers into the MAP View containing the coordinate system you require, as discussed in the MAP Views palette section.

ASSIGNING A PROJECTION

If you wish to set the current projection of the data, rather than change projection, you can click the ***Source Projection*** button. You must use caution, as this option will set source projections only, and not serve to reproject your data. Therefore data integrity may be lost if you overwrite the current projection of the MAP View via the use of this utility. Please see page 50 for a description of this function.

SEARCHING FOR A PROJECTION

The ***Search Projection*** tool, which is available in all occurrences of the Source Projection and MAP View Editor dialogs, allows you to search for projections based on an entered text string. Searches can be performed on the whole database, or solely in Datums, Ellipsoids, Projection Names, Projection Types, or Units. To access the Search Projection dialog, click the  icon in *the MAP View Editor* or in *Source Projection*.

In the *'**Find what**'* field enter the text on which to search. For example to find coordinate systems with 'NAD83' properties, enter *'NAD83'*. From the *'**Where**'* dropdown, select an area of the database in which to search. For example to find 'NAD83' in the name only, select *'Projection names'*.

When you have entered the search criteria click the *'**OK**'* button. If the search has returned results, these results will be displayed in *the MAP View Editor* or *Source Projection* in the *'Search Results'* category, and can be immediately selected in order to reproject your data or to assign a projection. Search results will be stored in this category until you restart Illustrator or perform another *'Search Projection'*.

ROTATION

A rotation figure can be applied or edited by specifying an angle in the entry field, or by using the 'clock hand' to rotate the MAP View graphically. Notice that changes to rotation will be automatically previewed in the Preview Pane, with the green rectangle and arrow depicting the new orientation of the data.

NEW MAP VIEWS

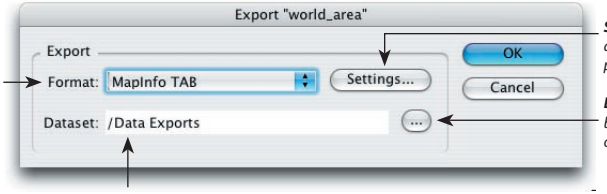
Finally the MAP View Editor is opened by default when creating a ***New MAP View***. This will enable you to quickly specify the name, coordinate system and page scaling for your New MAP View. This functionality will be discussed in detail in How to Georeference an Illustrator file on page A1/38. After you have created a new MAP View, you must use the ***Specify Anchors*** option from the MAP Views palette to define the tie-in point between Map Anchors and Page Anchors (see page 36). Note that you must enter Map Anchor values that are indicative of the unit of measurement used in the chosen coordinate system, which may mean these values are not in degrees or Lat/Longs.

MAP VIEW EDITOR TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
5-ix ... Reprojecting using the MAP View Editor
5-x ... Editing Scale and Positioning
5-xi ... Copying a Projection from One Layer to Another
5-xii ... Creating a New MAP View

Export

MAP Views > Options > Export



Format *- Select the data type to which you wish to export. This dropdown lists the names of all MAPublisher supported data types.*

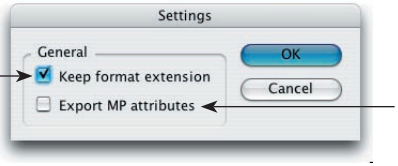
Settings *- Opens a Settings dialog for the input of extra parameters (see below).*

Browse *- Opens a Data Source browser to enable the selection of a directory* for export.*

Dataset *- Displays the directory path* for the export of the currently selected layer. You can also manually type in the dataset location here. *Export to AutoCAD or Microstation will require you to specify a file name and directory.*

Export Settings

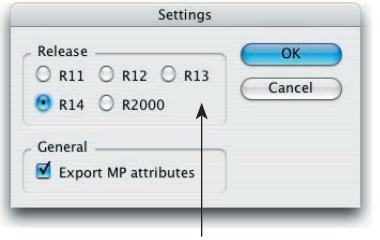
General Settings



Keep format extension *- Tick this option to export the layer with its feature extension (_area, _line, _point, or _text) which was automatically appended to layer names during import.*

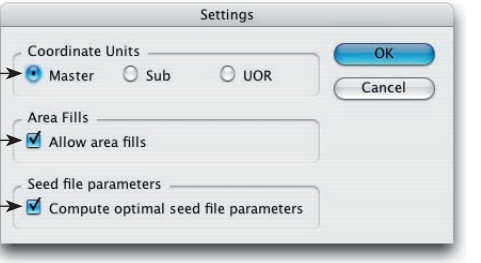
Export MP attributes *- Tick this option to include the 'MPArea', 'MPPerimeter' or 'MPLength' attribute columns in the exported layer's attribute table.*

AutoCAD Settings



Release Version *- Specify the AutoCAD version number you wish to export to.*

Microstation Settings



Seed file parameters *- Automatically adjust the origin and scaling of the layer to provide an optimum set of parameters for a seed file.*

Area Fills *- Controls whether or not fill linkages will be written out for ellipses, shapes, and solids.*

Coordinate Units *- Specifies how feature coordinates will be interpreted and converted (Master, Sub or Units of Resolution).*

FUNCTIONALITY

MAPublisher supports the export of MAP Layers to various GIS formats, maintaining all georeferencing and attribute information. The following export formats are supported:
AutoCAD (*.dxf) (*.dwg)
ESRI ArcInfo Export (*.e00)
ESRI ArcInfo Generate (*.gen)
ESRI Shapefile (*.shp)
MapInfo Interchange (*.mif / *.mid)
MapInfo Table (*.tab)
Microstation (*.dgn)
Please view the descriptions of these Export formats on pages 20 to 22.

PREREQUISITES

The Export function will export any Illustrator layers that are contained in a specified MAP View. Therefore both imported and user created MAP Views will contain MAP Layers that are suitable for export to GIS formats. MAPublisher will automatically export layers in the feature type of the selected layer.

When exporting Area layers to GIS formats, polygon outlines must have a positive *'MPArea'* value, whereas holes held inside compound paths (or 'complex shapes') must have a negative *'MPArea'* value. If you have values for polygons in the 'MPArea' column of your MAP Attribute table which contradict these guidelines, you can use *Flip Selected Lines* (page 89) to convert the MAPublisher area calculation from a negative to a positive value or vice versa. For the correction of simple closed areas, use Select by Attribute to select all elements that have an 'MPArea' of less than zero. Then go to *Filter > Flip Selected Lines*.

To open the Export dialog, first select the layer you wish to export in the MAP Views palette. Note only MAP Layers (and not MAP Views) can be exported. Then click on the Options arrow in the upper right corner of the dialog and select *Export (layer name)*.

USING MAP EXPORT

Within the dialog select the Export ***Format*** you require, and then click the ***Settings*** button.

FEATURE TYPE EXTENSION SETTING

The MAP Layer you are exporting will be the default name of the exported file. However the feature type text (i.e. _area, _line, _point, or _text) appended to Illustrator layers by MAPublisher in the Import process, will be removed during the export process, unless you specify that you wish to keep this. If you wish to keep the feature type text, check the ***Keep format extension*** option

MP ATTRIBUTES SETTING

You can also choose to export the MP Attribute columns which form part of the attribute table in MAPublisher. These columns are named '***MPArea***' and '***MPPerimeter'*** for Area layers, and '***MPLength'*** for Line layers (see page 36). If you wish to add these columns to the exported data table, check the ***Export MP attributes*** option.

AUTOCAD SETTINGS

For AutoCAD exports click the Settings button to specify the AutoCAD version.

CHOOSING A DESTINATION FOLDER

Most of the export formats will require you to select a destination folder only. Subsequently for export to ***ESRI*** or ***MapInfo*** formats, simply click the ***Browse*** button to specify a destination folder. Click the ***OK*** button to export your MAP Layer.

In the case of exporting to ***AutoCAD*** format you will be required to specify a name for the exported file, and clarify the file extension *(DXF* or *DWG)* to be used. For ***Microstation*** you will be required to specify a name for the exported file. Therefore if you wish to export to either of these formats, click the ***Browse*** button to name the export file, and then choose the file format from the ***Format*** dropdown.

MAP EXPORT TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
5-xiii ... Exporting Data to GIS Formats

Chapter 6
Plotting Points

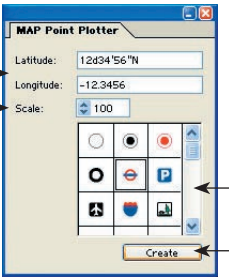
Having the ability to place points onto a map is a fundamental part of cartography. Points can represent the locations of towns and cities, shops and malls, airports and train stations to name but a few. MAPublisher 6 provides the functionality to create or plot points in vector format.

There may be times when you wish to quickly add a point or a small group of points to your map but you do not have a GIS or ASCII file containing these points ready for import. Alternatively your map may be in a projection that holds coordinates in distance units, yet the coordinates of your point locations are in Latitude and Longitude.

Providing you have a fully specified MAP View, and know the coordinates (in either Decimal Degrees or Degrees, Minutes and Seconds) for the locations you wish to plot, you can use the MAPublisher Point Plotter to have your points automatically added at their correct locations.

Point Plotter

Window > MAPublisher Palettes > MAP Point Plotter



Coordinate Entry Boxes *- Enter the coordinates of the point to be plotted in either Decimal Degrees OR Degrees, Minutes & Seconds.*

Scale *- Change the size of the chosen symbol if required. The arrow keys will increase or decrease the scale value by 10% increments.*

Symbol Selection *- Choose a symbol to use. The symbols displayed here will be the same as in the Illustrator Symbols palette.*

Create *- Click to plot a point using the entered values.*

PREREQUISITES

In order to plot points using the Point Plotter, you must first have a fully georeferenced MAP View in your document, as this function will use the coordinate system of that MAP View in order to generate points. Furthermore you must create a new Illustrator layer in which your points will be placed, as the software will not support multiple feature types on the same layer. Remember once you have created a Point layer, you must drag it into the desired MAP View, specifying P ***Point*** in the Undefined Layer dialog.

When you have a Point layer created in the correct MAP View, and a Symbols palette you will find useful for this function, you can open the Point Plotter. This palette is located under Window > MAPublisher Palettes.

USING POINT PLOT

SETTING UP THE SYMBOL SELECTION

The symbols used by Point Plotter are a direct reproduction of those that exist in the ***Illustrator Symbols*** palette. To open the Illustrator symbols palette go to Window > Symbols. If you wish to add points to this palette, create your symbols as closed Illustrator objects and simply drag them into this palette. Alternatively open the ***MAP Symbols*** file in the Utilities folder on your MAPublisher CD, and drag the symbols into your Illustrator Symbols palette.

ENTERING COORDINATES

Coordinate values can be entered in either Decimal Degrees (DD.dd), or Degrees, Minutes and Seconds (DMS.ss). These values are entered into the Latitude and Longitude fields. Lines of Latitude run North-South (the Equator is an example), whereas Lines of Longitude run East-West (the Greenwich Meridian is an example). Positive Degree values are Latitude North and Longitude East. Negative Degree values are Latitude South and Longitude West.

Example Decimal Degree values:

Latitude Values:	***12.3456***	*= 12.3456 Degrees North*
	-12.3456	*= 12.3456 Degrees South*
Longitude Values:	***12.3456***	*= 12.3456 Degrees East*
	-12.3456	*= 12.3456 Degrees West*

Example Degrees, Minutes and Seconds values:

Latitude Values:	***12d34'56.78"N***	*= 12 Degrees, 34 Minutes, 56.78 Seconds North*
	12d34'56"S	*= 12 Degrees, 34 Minutes, 56 Seconds South*
Longitude Values:	***12d34'56.78"E***	*= 12 Degrees, 34 Minutes, 56.78 Seconds East*
	12d34'56"W	*= 12 Degrees, 34 Minutes, 56 Seconds West*

CHOOSING A SYMBOL AND SCALE

When you have entered your values select an appropriate symbol to use. Again the symbols displayed are the symbols that currently exist in the Illustrator Symbols palette. If you wish to scale the symbol used, edit the ***Scale*** entry field. Clicking the ***Up*** and ***Down*** arrows will increase or decrease the value by 10%.

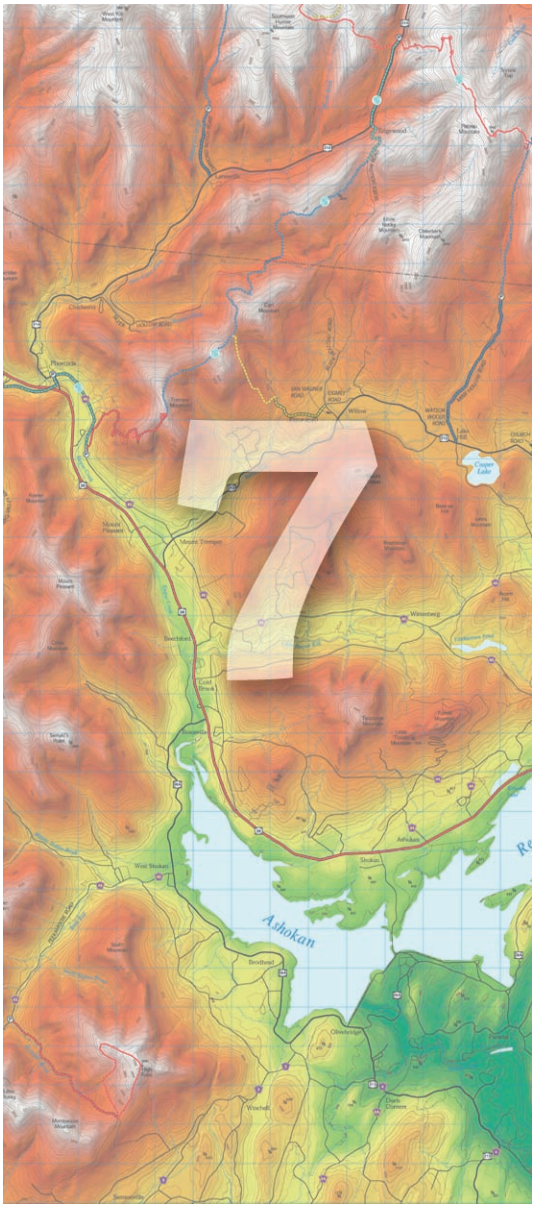
PLOTTING POINTS

Click ***Create*** to plot the point in the designated MAP View. To plot subsequent points, edit the Latitude and Longitude, and also choose different points if required.

POINT PLOTTER TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
6-i ... Plotting Points in Decimal Degree or DMS Format

Chapter 7
Legends and Stylesheets



MAPublisher provides extensive tools for quickly, easily and accurately creating point, line and area legends from your map data. The MAPublisher Stylesheet and Legend functions are able to read and work with the data found in the MAP Attribute tables and to apply strokes, fills and symbols to map elements according to the legend criteria you specify.

There are three legend functions in MAPublisher 6, which will be discussed in this section:

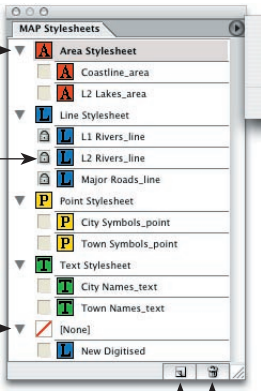
MAP Stylesheets is a new function allowing you to quickly create and apply legends on a one to one ratio with Illustrator Styles and Symbols.

Assign Legend Info and **Auto Assign Legend Info** are designed to enable the application of legends on a one to one or value range basis, based on custom legend artwork that you have created in your map document.

MAP Stylesheets

Window > MAPublisher Palettes > MAP Stylesheets

MAP Stylesheets palette



MAP Stylesheet List *- An alphabetical list of the MAP Stylesheets and component MAP Layers in the current document. Both are depicted with their feature type.*

Lock button *- Click this button to lock or unlock the Layer.*

Other MAP Layers *- Lists the MAP Layers which are not components of any MAP Stylesheet, therefore belonging to a Stylesheet of 'None'.*

New MAP Stylesheet button *- Opens the* **New Stylesheet** *dialog to specify a name and feature type for the new stylesheet.*

Delete MAP Stylesheet button *- To delete the selected Stylesheet.*

Options Menu...

New MAP Stylesheet *- Opens the* **New Stylesheet** *dialog to specify a name and feature type for the new stylesheet.*

Duplicate MAP Stylesheet *- Will create a Duplicate of the selected MAP Stylesheet.*

Edit MAP Stylesheet *- Will open the* **Edit MAP Stylesheet** *dialog.*

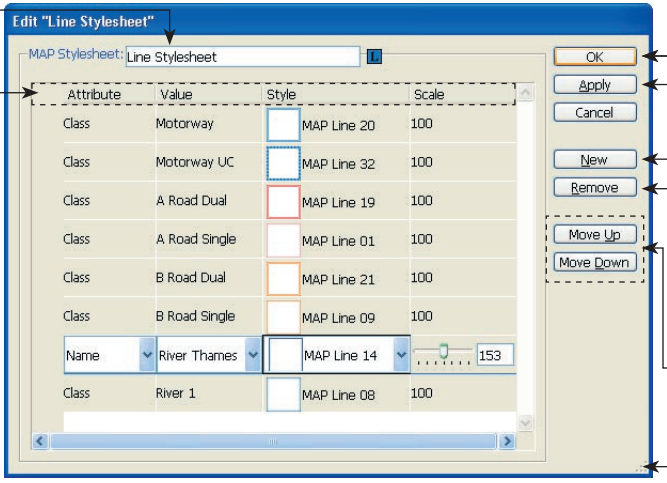
Delete MAP Stylesheet *- Allows you to delete the selected MAP Stylesheet.*

New Stylesheet dialog

Name *- Specify a name for the new MAP Stylesheet.*

Feature Type *- Allows you to specify the Feature Type for the MAP Stylesheet. This can be Area, Line, Point or Text.*

Edit MAP Stylesheet dialog



Name *- The editable name of the current MAP Stylesheet.*

Attribute *- List the columns of the attribute table(s) in the associated MAP Layer(s).*

Value *- Lists the attribute values for the selected attribute column.*

Style *- Lists the Styles that exist in the Illustrator Styles palette (for Area and Line stylesheets) or in the Symbols palette (for Point stylesheets).*

Scale *- Allows you to scale the symbols for Point legends, and stroke or style weights for Area and Line legends. Enter a scale directly in into the entry field or drag the slider to increase or decrease. Clicking next to the slider will increase or decrease in 10% increments.*

OK *- Will apply the current MAP Stylesheet to the associated MAP Layer(s).*

Apply *- Will apply any changes to the current MAP Stylesheet and update the associated MAP Layer. Edits can be previewed prior to exiting the dialog.*

New *- Clicking this button will create a new style rule in the MAP Stylesheet, and activate the fields for Attribute, Value, Style, and Scale.*

Remove *- Will remove the selected style rule.*

Move Up/Down *- Will move the selected style rule up or down the list.*

Resize *- Drag the lower right corner of the horizontally or vertically to expand the Stylesheet List.*

FUNCTIONALITY

MAP Stylesheets is a new function in MAPublisher 6, which will allow you to quickly create and apply legends based on the Styles and Symbols that exist in the respective Illustrator palettes. Stylesheets are created inside a MAPublisher dialog, where specific values contained in the attribute table for the related layer are assigned Illustrator symbology. The MAP Stylesheet function operates on a one to one basis, where specific attribute values are assigned with a specific style or symbol (i.e. Attribute Value A = Style 1). Attribute value ranges (i.e. Greater than Value A) are not supported by MAP Stylesheets. Stylesheet information will be saved in the Map Document so that the MAP Stylesheet can be quickly edited later.

USING MAP STYLESHEETS

THE MAP STYLESHEETS PALETTE

This is the starting point for working with MAP Stylesheets, and is opened by going to *Window > MAPublisher Palettes > MAP Stylesheets*.

In the list box of the MAP Stylesheets palette will be entries for each Illustrator layer that
a) belong to a specified MAP View, and
b) are of a feature type supported by MAP Stylesheets.

In ***Illustrator 10*** you can create MAP Stylesheets for ***Area***, ***Line***, and ***Point*** layers.
In ***Illustrator CS*** you can create MAP Stylesheets for ***Area***, ***Line***, ***Point*** and ***Text*** layers.

As in *MAP Views*, the icons used for these layers are:

A Area layer L Line layer
P Point layer T Text layer

By default all MAP Layers will be listed as belonging to a Stylesheet of [None]. When you have created a new Stylesheet you can drag a MAP Layer into it, in order to specify the attributes and symbology you require.

LOADING SYMBOLS AND STYLES

The symbology used by MAP Stylesheets is directly related to the Symbols and Styles which exist in native Illustrator palettes. In order to correctly function, the MAP Stylesheets tool requires that symbology appropriate to the feature type is established in the following Illustrator palettes:

Illustrator 10:

P ***'Symbols'*** palette *(Window > Symbols)* for ***Point Stylesheets***.
A L ***'Styles'*** palette *(Window > Styles)* for ***Area*** and ***Line Stylesheets***.

Illustrator CS:

P ***'Symbols'*** palette *(Window > Symbols)* for ***Point Stylesheets***.
A L ***'Graphic Styles'*** palette *(Window > Graphic Styles)* for ***Area*** and ***Line Stylesheets***.
T ***'Character Styles'*** *(Window > Type > Character Styles)* for ***Text Stylesheets***.

Symbology can be quickly added to these palettes by dragging and dropping artwork from the Illustrator page, or by dragging and dropping symbology from custom libraries.

As an example under *Window > (Graphic) Style Libraries > Other Library…* navigate to the *Utilities* folder on your MAPublisher CD and load either ***MAP_AreaStyles.ai*** or ***MAP_LineStyles.ai.*** Then shift-select these styles in the new ***MAP_Styles*** palette and drag them into the Illustrator ***Styles*** palette for use in ***Area*** and ***Line Stylesheets***.

Similarly you can navigate to *Window > Symbol Libraries > Other Library…* and load ***MAP_PointSymbols.ai***. Then shift-select these symbols and drag them into the ***Symbols*** palette for use in ***Point Stylesheets***.

CREATING A NEW STYLESHEET

To create new MAP Stylesheets you must first select ***New MAP Stylesheet…*** under the *Options* menu, or click the ***New*** button at the base of the palette. This will open the ***New Stylesheet*** dialog, where you are required to specify the name and feature type for the new MAP Stylesheet. Clicking ***OK*** will place the new stylesheet in the palette and assign it with the appropriate icon. It is possible to now drag a ***MAP Layer*** with a matching feature type into this stylesheet. You can drag more than one layer into a MAP Stylesheet, as long as all the MAP Layers are of a feature type which matches the MAP Stylesheet. If your data is held across a number of layers, all of these layers can be placed inside the same stylesheet for quick update. Note that they do not need to contain the same attribute structures. As long as they are all of a matching feature type they can be placed inside one MAP Stylesheet.

ACCESSING THE EDIT MAP STYLESHEET DIALOG

When you have a MAP Stylesheet created which hosts at least one MAP Layer of the same type, click on the stylesheet name, and go to *Options > Edit…* Alternatively *double-click* the new MAP Stylesheet. This will open the ***Edit MAP Stylesheet*** dialog.

The ***Name*** of the current MAP Stylesheet will be displayed at the top of this dialog, which is editable. Also a feature type icon will be displayed. To begin, click the ***New*** button to create the first element in your MAP Stylesheet.

SELECTING ATTRIBUTE COLUMNS AND VALUES

The ***Attribute*** dropdown will contain the names of the attribute columns that exist in all attribute tables on associated MAP Layers (see more on the MAP Attributes window on page 38). Using the dropdown you must select a Column on which to base the symbology for the first style rule. Subsequently, the ***Value*** dropdown will contain the unique values that exist in the selected attribute column. Again you must make a selection from this dropdown. If you are aware of the column structure and values you wish to specify, you are able to manually type into the ***Attribute*** and ***Value*** fields, rather than choosing from the dropdowns.

SELECTING STYLES AND SYMBOLS

The ***Style*** field will contain a list of styles that currently exist in the Illustrator ***(Graphic) Styles*** palette (for Area and Line stylesheets), in the Illustrator ***Symbols*** palette (for Point stylesheets), or in the Illustrator ***Character Styles*** palette (for Text stylesheets). For the expression you have built in the Attribute and Value fields, choose a style or symbol to use. Note that you can only use a specified style once in a single stylesheet. The ***Move Up*** and ***Move Down*** buttons will move the priority of the selected style up or down the list.

ASSIGNING AN SCALE

The ***Scale*** default is 100%. Editing the scale will alter the symbol size or stroke weight depending on feature type.

BUILDING THE STYLESHEET

For subsequent style rules proceed in the same manner. Click ***New***, and then specify an ***Attribute*** column, ***Value***, ***Style*** and ***Scale***. You can click ***Apply*** at any time to preview the results at any stage of building a stylesheet, and also return to edit settings you have made for individual style rules. In order to delete a legend item from the list, click anywhere in its row and click the ***Remove*** button.

Click ***OK*** to exit the dialog and to assign the MAP Stylesheet to the associated MAP Layers.

DELETING AND DUPLICATING STYLESHEETS

You can create as many MAP Stylesheets as you wish within the document. Note that under the ***Options*** in the MAP Stylesheets palette there are functions to ***Delete*** and ***Duplicate Stylesheets***.

You can delete the selected MAP Stylesheets by clicking the ***Delete*** button at the base of the palette or by selecting ***Delete Stylesheet*** under the ***Options*** menu. If you wish to delete a stylesheet you must first drag associated MAP Layer(s) out of the stylesheet, such as into a Stylesheet of *[None]* or into another Stylesheet. Only at this stage will the Delete option be activated. Note that moving a stylesheet to *[None]* will not restore the data to its default symbology; it will simply remove the relationship between attribute value and style/symbol.

Select ***Duplicate Stylesheet*** to create a copy of the selected MAP Stylesheet. Duplicating Stylesheets can be used to create copies of existing stylesheets. Even though the copy will not contain a MAP Layer at first, the style rules which exist between attributes of the original layer and the symbology will be retained. Simply by editing the styles that relate to each value in each stylesheet, you can drag a MAP Layer from one MAP Stylesheet to another in order to output different versions of a map.

IMPORTANT NOTES

A point to note is that once a MAP Stylesheet has been assigned with styles and symbols, those styles and symbols are dynamically linked to their attribute values in the MAP Stylesheet. Applying a style manually (i.e. changing a style for a polygon directly from the Styles palette) will assign the attribute value of that style rule in the MAP Stylesheet. Therefore caution should be used with manually editing the styles of artwork after MAP Stylesheets have been applied.

As styles and symbols which exist in these Illustrator palettes are linked to the related MAP Stylesheet entries, using these styles and symbols to create new artwork will automatically assign the related attribute value to these objects.

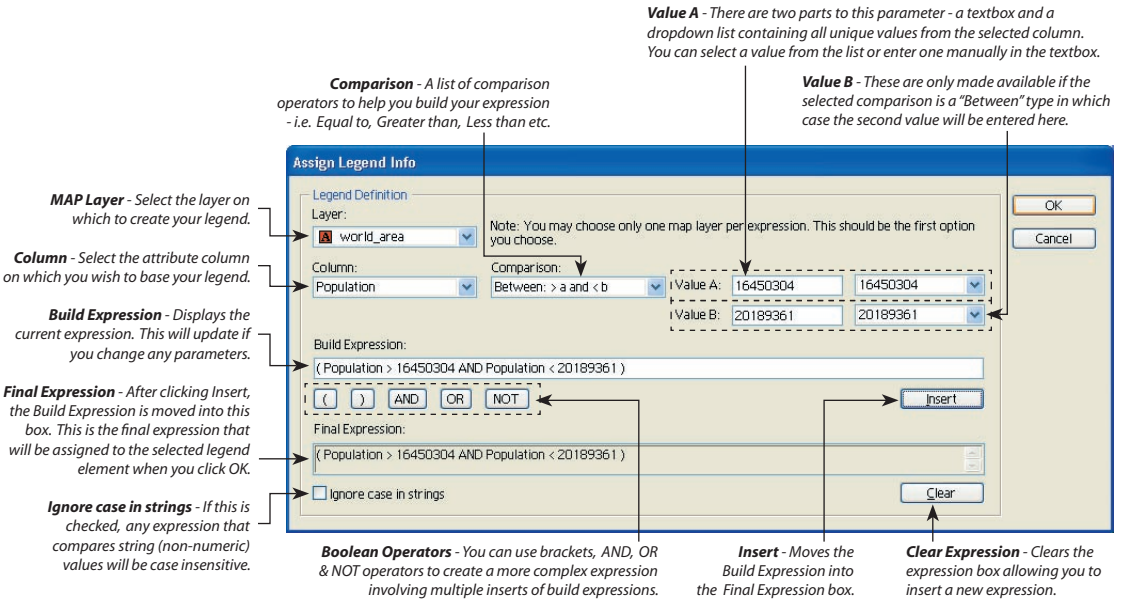
Regarding the editing of ***Point Data***, you must use either MAP Stylesheets or the MAPublisher Legend filters to change symbology. As point data is linked dynamically to the symbols which exist in the Symbols palette, you cannot edit graphical properties manually. Choosing *'Break Link to Symbol'* from the Symbols palette options will result in the loss of attributes for your point data.

MAP STYLESHEETS TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
7-i ... Creating an Area Stylesheet
7-ii ... Creating a Line Stylesheet
7-iii ... Creating a Point Stylesheet
7-iv ... Duplicating Stylesheets
7-v ... Editing Styles to Change Attributes

Assign Legend Info

Filter > MAP Legend > Assign Legend Info



FUNCTIONALITY

The Assign Legend Info filter allows you to create a custom legend for your map based on its attribute information using user-defined parameters. This filter assigns legend criteria to map elements that exist in a single related MAP Layer. Legend elements are plotted using Illustrator's tools in the MAP Document itself. Assign Legend Info operates on both a one to one basis (i.e. Value A = Legend Item 1) or with attribute value ranges (i.e. Greater than Value A, Between Values A & B etc). Legend information will be saved in the legend elements within the document.

PREREQUISITES

In order to use the Assign Legend Info filter you must first create your legend elements in the document, and place them on a MAP Layer with a feature type of ***Legend***.

Create a new layer in your Illustrator layers palette to hold the legend. In the MAP Views palette drag this layer into the MAP View holding the MAP Layer that you wish to apply the legend to. You can construct legends for Area, Line Point and Text layers. When you drag the new layer into the MAP View, set the feature type to 'Legend'. With the Legend layer selected in the Illustrator layers palette, construct the number of unique legend items that you require. Area legends should be symbolized with closed shapes, line legends with line strings, and Point legends with symbols. As long as these legend elements are on a Legend Layer, they can be assigned legend information.

When you have created your legend elements, each element is assigned legend information via Assign Legend Info. When all legend elements have this information, the map can be quickly updated. Therefore with one legend element selected on the Legend Layer, go to *Filter > MAP Legend > Assign Legend Info* to open the dialog.

USING ASSIGN LEGEND INFO

DIALOG OVERVIEW

The filter is very similar to Select by Attribute, though this time you assign attribute information to legend items. First you choose the ***MAP Layer*** on which you wish to apply the legend. This will populate the ***Column*** dropdown list with that layer's attribute structure. A particular column is selected and then a logical ***expression*** is built defining the desired attributes or attribute range to assign to the legend element. For example, *"Assign populations between 100,000 and 200,000"* is typical legend criteria you could assign depending upon the attribute data associated with your MAP Layer.

BUILDING AN EXPRESSION

To use Assign Legend Info you must first determine the ***MAP Layer*** to be used for the legend, which will load the related attribute table into this dialog. You can then select a ***Column*** of the attribute table, a ***Comparison***, and a choice of ***Values*** from the dropdowns in order to build an expression. When the expression has been built you must click the ***Insert*** button. The ***Boolean operator*** buttons can be used if you wish to use multiple columns or values in order to generate an expression.

When the expression is complete and has been inserted into the ***Expression*** field, click ***OK*** to apply the rule to the selected legend item.

UPDATING THE MAP

Proceed with your other legend items in the same manner. When you have assigned legend information to all the legend items, select them all, and go to *Filter* > *MAP Legend* > ***Draw Legend Layer***. This will update the associated MAP Layer so that the map elements reflect the legend items.

If you wish to change the symbology assigned to legend elements, simply change these using Illustrator's object-editing options. Then reselect the legend elements and again click on ***Draw Legend Layer*** to update the MAP Layer.

LABELING LEGEND ITEMS

The ***MAP Tagger Tool*** (see page 74) can be used to label your legend items in order to display the attribute expressions that have been assigned to them.

SELECTING ARTWORK BASED ON LEGEND VALUES

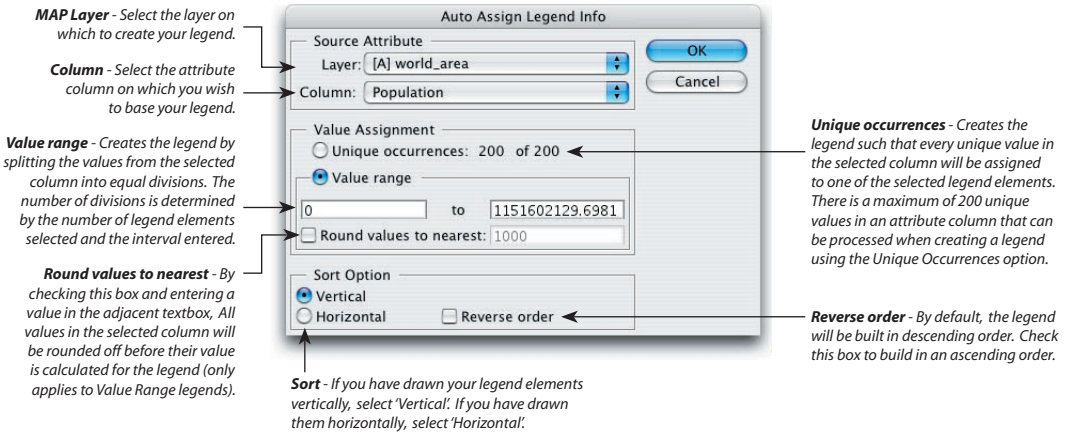
The ***Legend Matching Features*** filter can be used to quickly select all features on a MAP Layer corresponding to a particular legend element. In order to use this function, you must have already created a legend using Assign Legend Info or Auto Assign Legend Info. To use this feature select one or more of the Areas, Lines or Points you used for your legend, then go to *Filter* > *MAP Legend* > *Legend Matching Features*. The map features associated with the selected legend items will be subsequently selected.

ASSIGN LEGEND INFO TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
7-vi ... Building an Area Legend using Assign Legend Info
7-vii ... Building a Point Legend using Assign Legend Info

Auto Assign Legend Info

Filter > MAP Legend > Auto Assign Legend Info



FUNCTIONALITY

The Auto Assign Legend Info filter allows you to automatically create a custom legend for your map based on its attribute information. This filter works similarly to Assign Legend Info, but this time assigns legend criteria automatically to map elements by determining a method to divide your data according to the number of legend elements you wish to use.

PREREQUISITES

In order to use the Auto Assign Legend Info filter you must first create your legend elements in the document, and place them on a MAP Layer with a feature type of ***Legend***.

Create a new layer in your Illustrator layers palette to hold the legend. In the MAP Views palette drag this layer into the MAP View holding the MAP Layer that you wish to apply the legend to. You can construct legends for Area, Line and Point layers When you drag the new layer into the MAP View, set the feature type to 'Legend'.

With the Legend layer selected in the Illustrator layers palette, construct the number of legend items that you require. Area legends should be symbolized with closed shapes, line legends with line strings, and Point legends with symbols. As long as these legend elements are on a Legend Layer, they can be assigned legend information.

When you have created your legend elements, all elements are assigned legend information automatically via Auto Assign Legend Info. When the legend elements have this information, the map can be quickly updated. Therefore with all the legend elements selected on the Legend Layer, go to *Filter > MAP Legend > Auto Assign Legend Info* to open the dialog.

USING ASSIGN LEGEND INFO

DIALOG OVERVIEW

To use Auto Assign Legend Info you must first determine the ***MAP Layer*** to be used for the legend, which will load the related attribute table into this dialog. You should then select a ***Column*** of this attribute table on which to base the assigning of legend values. There are two options available for auto assigning legends: ***Unique occurrences*** and ***Value range***.

UNIQUE OCCURRENCES

If you select this option, each unique value in the selected column will be assigned to each of the selected legend elements. For Example, if a column contains either an a, b, or c, three different legend elements will each be assigned a single value. This option is most often used with text and alphanumeric type attributes (i.e. Road Class = A41 or Zoning = Park).

VALUE RANGE

Value Range works by splitting the selected column's values into sections. The number of sections depends on the number of legend elements. For example, if you have four legend elements drawn and the column had a value range of 0 - 100, the first element would be associated with all features where that column had a value between 0 and 25. The second element would be associated with all features where the column had a value between 26 and 50 and so on. This option can only be used with numeric attributes (i.e. Population = 12,000,432 or Area = 6,666).

If you are unsure of the number of legend elements to create when using the value range option, you can quickly open the Auto Assign Legend Info window and see how many unique value occurrences there are in the data column. You can then simply decide on a number of legend elements that is a factor of the total number of unique values.

The Value Range option also provides the option to ***Round values*** to the nearest specified number. Enter a value in this field in order to round off all values in the selected column before their values are calculated for the legend.

SORT OPTIONS

The ***Sort*** option will determine how the generated legend criteria will be applied to your legend elements. For example, if you have drawn your legend vertically, select ***Vertical***.

The legend will be built in descending order as a default. If you wish to assign the legend values to your legend elements in an ascending order, check the ***Reverse order*** option.

UPDATING THE MAP

Proceed with your other legend items in the same manner. When you have assigned legend information to all the legend items, select them all, and go to *Filter* > *MAP Legend* > ***Draw Legend Layer***. This will update the associated MAP Layer so that the map elements reflect the legend items.

If you wish to change the symbology assigned to legend elements, simply change these using Illustrator's object-editing options. Then reselect the legend elements and again click on ***Draw Legend Layer*** to update the MAP Layer.

LABELING LEGEND ITEMS

The ***MAP Tagger Tool*** (see page 74) can be used to label your legend items in order to display the attribute expressions that have been assigned to them.

SELECTING ARTWORK BASED ON LEGEND VALUES

The ***Legend Matching Features*** filter can be used to quickly select all features on a MAP Layer corresponding to a particular legend element. In order to use this function, you must have already created a legend using Assign Legend Info or Auto Assign Legend Info. To use this feature Select one or more of the Areas, Lines or Points you used for your legend, then go to *Filter > MAP Legend > Legend Matching Features*. The map features associated with the selected legend items will be subsequently selected.

AUTO ASSIGN LEGEND INFO TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
7-viii ... Auto Assigning Legend Values - Unique Occurrences
7-ix ... Auto Assigning Legend Values - Value Range
7-x ... Selecting Features Based on Legend Attributes

Chapter 8
Text Creation

One of the most useful features of MAPublisher is the ability to create labels for map objects using values from the attribute tables. Manually entering and placing labels is not necessary provided that the labeling information is included in the map database of the layer being labeled.

MAPublisher provides two methods of adding labels to your map, both of which are very simple to use.

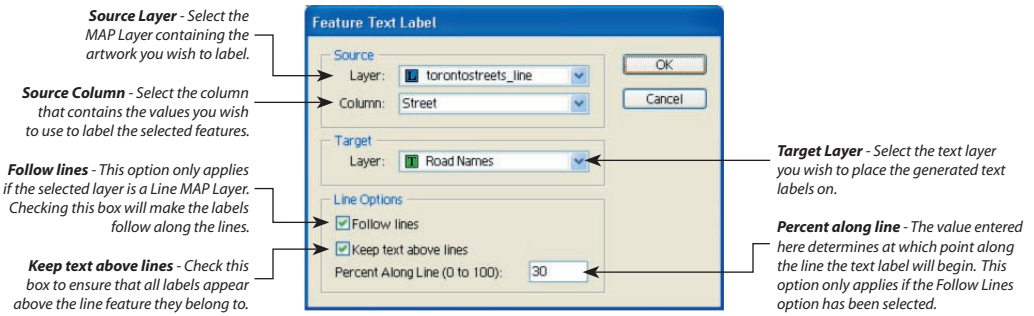
One way to create feature labels is to first select all the features you want to be labeled and use the **Feature Text Label** filter to label all of them by a specified attribute value.

An alternate method involves using the **MAP Tagger Tool** to apply labels individually. Both these methods are discussed in the following sections.

Both of these tools will be examined in this section.

Feature Text Label

Filter > MAP Legend > Feature Text Label



FUNCTIONALITY

The Feature Text Label filter allows labels to be added to your map based on the attribute data of the features. Line, Point or Area MAP Layers containing attribute information can be labeled using this filter. All selected features on MAP Layers, which contain appropriate attribute information, can be labeled using this tool.

PREREQUISITES

Before using this filter you must create a ***Text Layer*** in your MAP Views palette. Create a new Illustrator layer, and then drag it to the MAP View holding the features you wish to label. Set the feature type to '*Text*' when prompted.

Furthermore it is often useful to set you default text size, justification and font at this stage, as MAPublisher will generate labels based on these settings. Then simply select the features that you want to label and go to *Filter > MAP Legend > Feature Text Label* to open the dialog.

USING FEATURE TEXT LABEL

LABEL SOURCE

You must first set the options for MAPublisher to determine the attributes that will be converted to text labels. In the ***Source*** section, select the MAP Layer holding the attribute data you wish to use to label the features. This is the same MAP Layer that holds the vector data. Based on the layer you select, the ***Column*** dropdown will be populated with the attribute structure of this MAP Layer. You must choose a column that holds the attributes you wish to label the data with.

'TARGET' SECTION

In the ***Target*** section you must specify a Text MAP Layer that the labels will be output to. This should be the text layer you created prior to opening the dialog.

LINE OPTIONS

If you are labeling Line features, you have a number of additional options to consider:

You can choose to have the labels follow along the line paths by selecting the ***Follow lines*** option. If this option is used, MAPublisher will create a path for each line object in the selected MAP Layer, and place the text along this path. The labels can then be dragged and positioned at any position along a line. If the Follow Lines option is not selected, the labels will appear horizontal to the page at the mid-point of the line feature.

Check the ***Keep text above lines*** box if you wish to ensure that all labels appear above the line feature they belong to. Depending upon the manner in which the linework was originally digitized, some labels may be placed upside down if this box is not checked.

A specific value for the label's position can be entered in the ***Percent along line*** box. This option only applies if the ***Follow lines*** option has been selected. The value entered here determines at which point along the line the text label will begin.

RESULTS

When you have set all your options, click the ***OK*** button to label your features.

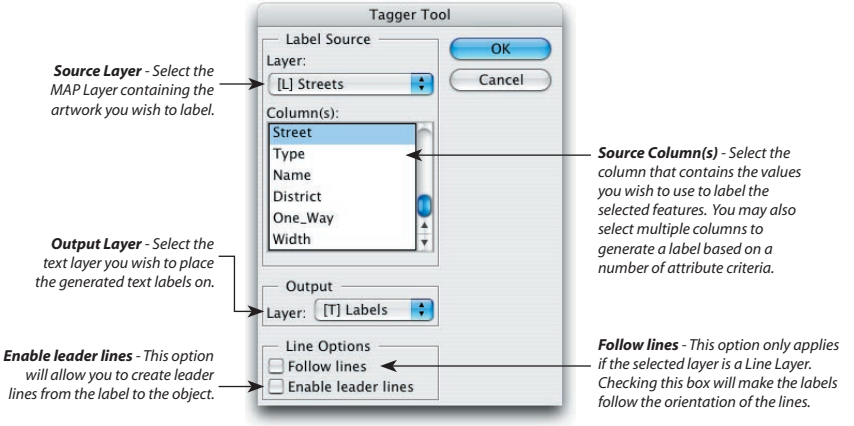
Labels applied using Feature Text Label will appear in the current default colour, font and font size. For later text edits, the stroke, fill, font and size of text labels can be changed at any time using Adobe Illustrator's tools.

FEATURE TEXT TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
8-i ... Generating Labels for a Line Layer using Feature Text Label

MAP Tagger Tool

Main Toolbar > MAP Tagger Tool



FUNCTIONALITY

The ***MAP Tagger Tool*** allows labels to be added to your map based on the attribute data of the features. All types of MAP Layers (Line, Point, Area, Text and Legend) containing attribute information can be labeled using this filter.

This tool functions similarly to the ***Feature Text Label*** filter. However, instead of having to select the features beforehand, you can simply click on any feature you want labeled and the label will appear. You also have greater control over the initial placement of the label with this tool because the label is placed where you click rather than in the centre of the feature. The MAP Tagger Tool also provides the ability to create leader lines for labeling congested areas of the map.

PREREQUISITES

Before using this filter you must create a ***Text Layer*** in your Illustrator layers palette. Create a new layer, and then drag this to the MAP View that hosts the features you wish to label, remembering to set the feature type to Text.

Furthermore it is often useful to set you default text size, justification and font at this stage, as MAPublisher will generate labels based on these settings. Labels placed using the MAP Tagger tool will appear in the stroke and fill defined in the Adobe Illustrator colour palette.

The MAP Tagger Tool can be found towards the bottom of The Adobe Illustrator tools palette. If the Adobe Illustrator tools palette is not visible you can activate it by selecting Window > Tools. Simply double click the ***MAP Tagger Tool*** in the ***Illustrator Tools*** palette to access the ***MAP Tagger Settings*** dialog.

MAP TAGGER TOOL SETTINGS

LABEL SOURCE

You must first set the options for MAPublisher to determine the attributes that will be converted to text labels. In the ***Label Source*** section, select the MAP Layer holding the attribute data you wish to use to label the features. This is the same MAP Layer that holds the vector data. Based on the layer you select, the ***Column*** dropdown will be populated with the attribute structure of this MAP Layer. You must choose a column that holds the attributes you wish to label the data with. Note that you can select more than one column if you require that labels use criteria across a number of attribute columns.

'OUTPUT' SECTION

In the ***Output*** section you must specify a Text MAP Layer. This should be the text layer you created prior to opening the dialog.

An option called ***Enable leader lines*** is available in the MAP Tagger Tool. This will allow you to create leader lines that run from the label to the object.

LINE OPTIONS

If you are labeling Line features, you have a number of additional options to consider:

You can choose to have the label follow the general orientation of the line path by selecting the ***Follow lines*** option. If this option is used, MAPublisher will create a single text item in the selected MAP Layer, which is at a similar angle to the path that is 'tagged'. The labels can then be repositioned as appropriate. If the Follow Lines option is not selected, the labels will appear horizontal to the page at the point that is clicked.

USING THE MAP TAGGER TOOL

When you have set all your options, click the ***OK*** button to exit the dialog.

With the ***Tagger Tool*** selected click on the map object to label it based on your settings. If you used ***Enable leader lines***, click and hold with the mouse when you select the object, and then drag away to the point at which you wish your text label to appear. A leader line will be generated linking the feature to the label.

In order to label an area by this method, you must click on the area's boundary unless the area has a fill. If the area has been filled, then a label may be placed by clicking anywhere inside the area.

If you wish to return to the MAP Tagger dialog to edit your settings, double click the tool.

For later text edits, the stroke, fill, font and size of text labels can be changed at any time using Illustrator's tools.

LABELING LEGEND ITEMS

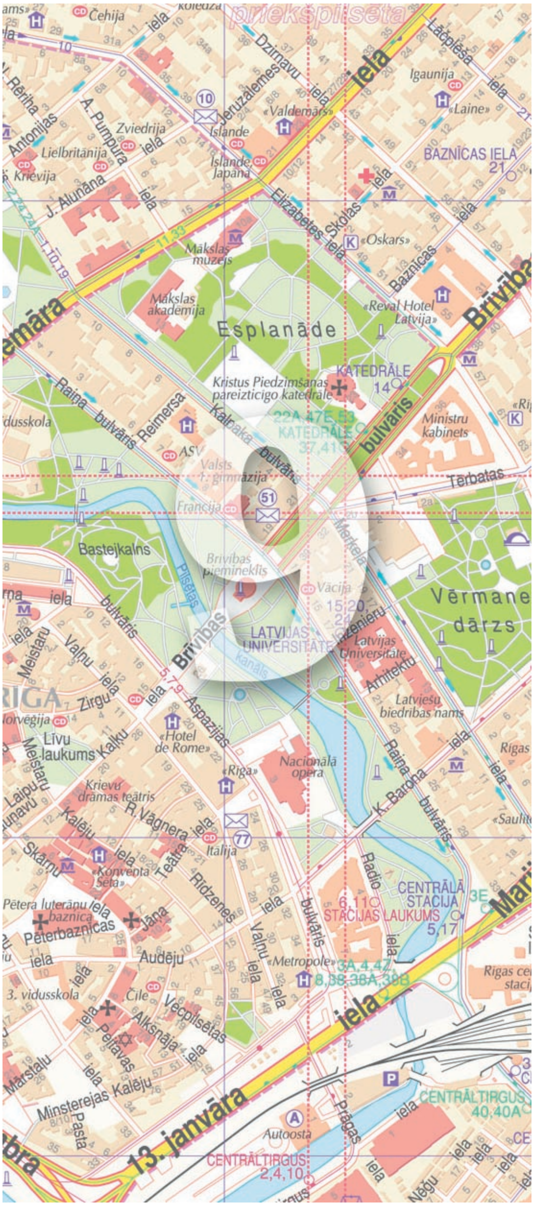
The MAP Tagger Tool may also be used to label or query legend elements that were generated via Assign or Auto Assign Legend Info. To label or query a legend element simply follow the procedure above, using values that pertain to your particular legend and click on the legend element you wish to label or query. A label identifying the expression used in either of the legend creation filters will be placed next to the legend element.

MAP TAGGER TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
8-ii ... Generating Labels for an Area Layer using the MAP Tagger Tool

Chapter 9

Grids and Indexes



MAPublisher contains tools for easily creating map grids and map indexes. Grids can be created for reference purposes, or to follow designated lines such as latitude and longitude, and can also be labeled for indexing. When a labeled grid has been established, MAPublisher is able to generate index files, containing the location of text objects in MAP Layers.

This section of the user guide details the use of the MAPublisher **Grid Generator** and **Make Index** filters for quickly and easily creating accurate grids and indexes for your map.

Grid Generator

Filter > MAP Legend > Grid Generator

Map Units *- If you have chosen to base your grid on Map Units, you must select the type of unit (i.e. meter, mile etc) to use.*

Lines/Rectangles *- You can choose to create the grid using either lines or rectangles.*

Vertices *- When your grid is created, this value will determine how many vertices will be used to create each rectangle or line.*

Grid Units *- You can choose to create your grid based on Map Units (i.e. meters, miles etc) or Page Units (points, inches etc).*

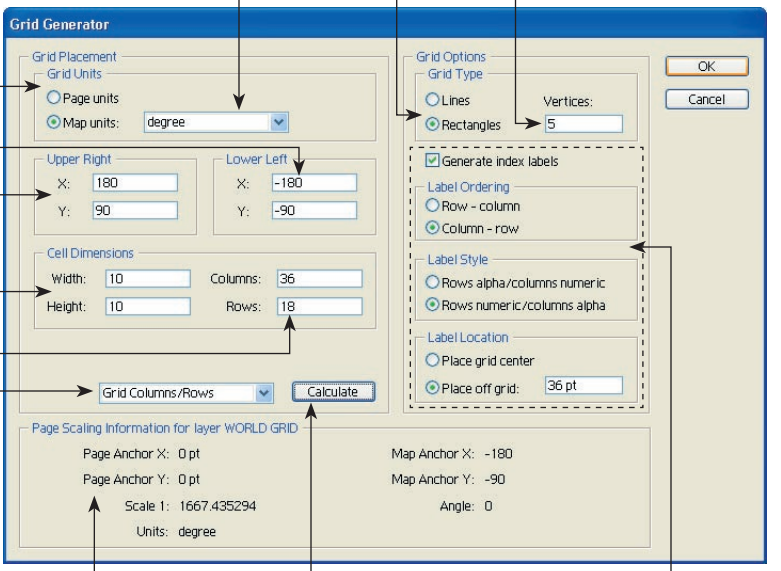
Lower Left X/Y *- These are the X and Y values of the lower left extent of the grid.*

Upper Right X/Y *- These are the X and Y values of the upper right extent of the grid.*

Width/Height *- Enter the size you want each grid cell to be. The values will be based on either page or map units, depending on which you have selected. If you have selected Map Units, it is also dependant on the value selected for Cell Size Units.*

Columns/Rows *- Enter the number of columns and rows you want your grid to have into these boxes.*

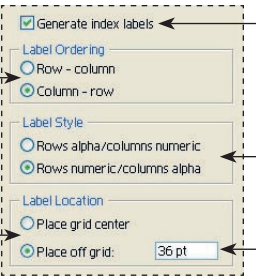
Calculate Parameter *- This list contains three items: 'Grid Upper Right', 'Grid Columns/Rows' and 'Grid Width/Height'. The parameter chosen here is the parameter that will be calculated when the Calculate button is clicked.*



Page Scaling Information *- This section displays all the scaling parameters for the current layer.*

Calculate *- Clicking this button will calculate the parameter selected in the adjacent dropdown list based on the values of the other parameters.*

Index Label Options *See inset.*



Label Ordering *- Choose the syntax of the index as being either Row-column or Column-row.*

Label Location *- Choose where the index labels will be placed. "Place grid center" will place the labels in the centre of each grid cell. "Place off grid" will place the labels around the frame of the grid.*

Generate index labels *- You can create indexing labels for your grid by checking this box. There are three options for the labels. Labels can only be generated for grids that are created using rectangles.*

Label Style *- Choose whether columns will be labeled alphabetically & rows numerically, or vice versa.*

Offset value *- This is the offset value (in page units) by which index labels placed off the grid will be located.*

FUNCTIONALITY

MAPublisher's ***Grid Generator*** will plot either grid lines or cells based on user-defined settings. Grids can be plotted in either Map Units, where the grid dimensions can be entered in a choice of distance units, or in Page Units, where the dimensions are read from the current document units. In order to subsequently use the Make Index filter, a grid must have been created with this tool, and that the grid must be constructed as *'Cells'*, each containing an alphanumeric grid reference label.

PREREQUISITES

Before using this filter you must create a  ***Legend Layer*** in your Illustrator layers palette. Create a new layer, and then drag this to the MAP View holding the features on which you wish to plot a grid, remembering to set the feature type to Legend.

Furthermore MAPublisher will use the current stroke and text settings when generating the grid and if applicable, its index labels. It is therefore useful for you to set your default text size, justification and font, as well as your stroke colour and weight at this stage. Then, with the Grid layer highlighted in your Illustrator layers palette, you should then open the dialog via *Filter > MAP Legend > Grid Generator.*

If you wish to create a Grid based on ***Page Units***, use your rulers to determine coordinates in document units to use for both the lower left corner and the upper right corner of the grid.

If you wish to create a Grid based on ***Map Units***, use the ***MAP Location Tool*** (see page 37) to determine coordinates in map units to use for both the lower left corner and the upper right corner of the grid.

USING THE GRID GENERATOR: PLACEMENT OPTIONS

PAGE SCALING INFORMATION

The current Page Scaling information is displayed in the lower portion of the dialog, which will assist you in deciding which options and values to use in constructing your grid.

GRID UNITS

The first element to consider is if you wish to construct a grid based on ***Page Units*** or ***Map Units.***

Calculating cell sizes in ***Page*** (document) ***Units*** can be useful if your MAP View does not contain georeferencing information or you are unsure of the real-world distance from one point to another.

Calculating cell sizes in ***Map Units*** can be useful for creating grids at actual lines of Latitude & Longitude, or in unit measurements that may otherwise be difficult to calculate. As long as your MAP View contains georeferencing information, you will be able to use this option to calculate grid cell sizes. MAPublisher offers a choice from over 30 units of measurement for the Map Unit category. However you should select the same Map Unit as is used in the coordinate system for your current MAP View, which is displayed in the lower part of the dialog.

ENTERING VALUES

The following paragraphs will deal with the input of values into the four pairs of entry boxes labeled ***Lower Left X/Y***, ***Upper Right X/Y***, ***Columns/Rows***, and ***Width/Height***.

The two key points to remember is that a minimum of three pairs of entry fields must be completed, of which only the ***Lower Left X/Y*** field pair is mandatory. The fourth entry can be calculated automatically by using the ***Calculate*** button with its adjacent dropdown. This ***Calculate Parameter*** listbox will display ***Grid Upper Right***, ***Grid Columns/Rows***, and ***Grid Width/Height*** as options. This will enable you to calculate the parameters for the fourth blank entry field pair, whether this is ***Upper Right X/Y, Columns/Rows***, or ***Width/Height*** respectively.

LOWER LEFT AND UPPER RIGHT VALUES

Entries for the ***Lower Left*** and ***Upper Right*** coordinates should be entered in the unit type you chose at the top of the dialog, therefore being in ***Page Units*** or your selected ***Map Units.*** The Lower Left X and Y values for the grid will be automatically set to the current ***Page*** or ***Map Anchors*** (see page 36).

If the units set are ***Map Units***, the Lower Left X and Y values for the grid will be automatically set to the ***Map Anchors*** in the unit in which they currently reside. Normally your choice of Map Units should be the same as the unit of the current MAP View, which is displayed in the lower part of the dialog. This will ease the effort of calculating values for the lower left and upper right corners of the grid.

If you wish to change the Lower Left coordinate for your intended grid you can type over the values displayed in the ***Lower Left X/Y*** fields. Subsequently if you know the Upper Right coordinates you should enter them in the ***Upper Right X/Y*** fields.

Note that you can calculate the Upper Right coordinates by selecting ***Grid Upper Right*** from the dropdown and clicking the ***Calculate*** button, if you have entered valid figures for ***Width/Height*** and ***Columns/Rows***.

COLUMNS AND ROWS

The ***Columns*** and ***Rows*** entry fields relate to the number of cells which will comprise your intended grid in east-west and north-south directions respectively. Enter the values you require in these '***Cell Numbers***' fields.

Note that you can calculate the number of cells by selecting ***Grid Columns/Rows*** from the dropdown and clicking the ***Calculate*** button, if you have entered valid figures for the ***Width/Height*** and ***Upper Right X/Y.***

CELL SIZE

The ***Width*** and ***Height*** entry fields relate to the size of each cell that will comprise your intended grid.

If you are entering values in ***Map Units***, these sizes will need to be entered in the unit you have chosen at the top of the dialog. If you are entering values in ***Page Units***, these sizes should be entered in document units.

Note that you can calculate the cell size by selecting ***Grid Width/Height*** from the dropdown and clicking the ***Calculate*** button, if you have entered valid figures for ***Columns/Rows*** and ***Upper Right X/Y***.

USING THE GRID GENERATOR: GRID OPTIONS

GRID TYPE

When you have completed all of the Placement Options, you need to decide if you wish to generate a grid based on ***Lines*** or ***Rectangles***. This choice can be specified in the ***Grid Type*** section. Either option will place the lines, or cell edges in the same locations on the layer therefore creating the same visible effect.
Note: if you wish to export your Grid using the MAPublisher *Export* function, you must generate your Grid as *Areas*.

Rectangles must be used if you are planning to create an ***Index*** through the use of your grid, as in order to locate text elements they must be inside a closed cell that has an alphanumeric identifier. As a consequence, the ***Index Label Options*** will only be active if the Grid Type is set to Rectangles.

Lines can be used if you wish to create a graticule effect, and do not wish to generate an index. It is also ideal if you plan to reproject the MAP View.

The ***Vertices*** field will allow you to enter the number of nodes that will comprise each Line or Rectangle. The default number for ***Rectangle*** is ***5*** nodes, whereas the default for ***Lines*** is ***2***, which correspond to the least amount of points that are required to build these elements. If you are planning to reproject your grid layer you should set the number of vertices to a high number, so this will mimic the curves composing a projected grid.

INDEX LABELS

The ***Generate index labels*** checkbox will only be enabled if the ***Grid Options*** are set to ***Rectangles***, as to locate text items for an index requires that the grid is created as shapes, and each cell has a separate reference identity. Checking this option will subsequently activate the ***Index Label Options***.

This section requires that you make three choices. The grid will be labeled alphabetically in one direction, and numerically in another. This will mean that each cell composing the grid has a unique identifier.

First choose if you wish to label your grid rows with letters and your columns with numbers, or vice versa, by selecting the appropriate option in the ***Rows alpha / Cols numeric*** OR ***Rows numeric / Cols alpha*** section.

Then choose if you wish labels to be placed in the centre of each grid cell, or have letters and numbers placed at the left and lower edges of your grid as identifiers. Select the option you desire in the ***Place grid center*** OR ***Place off grid*** section. If you choose to place identifiers around the edges of your grid, you can also specify the distance away from the edge of the grid that the text items will be placed. The value entered here must be in ***Points***.

If you have chosen to place labels ***Grid Center***, you can choose the format of these labels in the ***Row-column*** OR ***Column-row*** section. For example if you have chosen a ***Rows alpha / Columns numeric*** format, checking ***Row-column***, would produce labels such as ***A-1***. If you have chosen a ***Rows numeric / Columns alpha*** format, checking ***Row-column***, would produce labels such as ***1-A***.

RESULTS

When you have set all the options in the Grid Generator, click ***OK*** to plot the grid. The grid will be plotted using the current settings for Fill and Stroke. If applicable, the labels will be created using the current Text settings. Both can be changed using Illustrator's tools.

GRID GENERATOR TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
9-i ... Creating a Grid: Map Units / Auto Calculate Grid Cell Numbers
9ii ... Creating a Grid: Page Units / Auto Calculate Grid Upper Right

Make Index

Filter > MAP Legend > Make Index

FUNCTIONALITY

The MAPublisher ***Grid Generator*** filter contains options to subsequently generate an index for your map. Index files generated using this function are produced as a simple text file, and a typical file would be formatted as follows:

High Street A-4
King Road A-5
New Avenue B-4
Church Lane B-5

PREREQUISITES

In order to facilitate the creation of a map index using this filter you must have created a grid that is constructed as ***Rectangles***, and is labeled with ***alphanumeric*** identifiers. This grid must exist on a ***Legend Layer***.

The Make Index filter will index text labels that appear inside the rectangles of the grid, with the function exporting a text file containing the locations of these text items. Text labels to be indexed must be on a ***Text Layer***.

Open the dialog by going to *Filter > MAP Legend > Make Index.*

USING MAKE INDEX

'INDEX ENTRIES' SECTION

You should first choose the MAP Layer on which your text labels reside, and the MAP Layer on which your Grid resides. These choices should be made by using the ***Text Layer*** and ***Grid Layer*** listboxes respectively.

You have two options by which to index: ***By Text Objects***, or ***By Feature.***

INDEX BY TEXT OBJECTS

Select the ***By text objects*** radio button to generate an index using this method. ***Text Label*** indexing functions by referencing the grid cells where each text label is found. For example if the label "High Street" was found in Grid Cell A-4, the entry in the index file would appear as follows:

High Street A-4

INDEX BY FEATURES

Select the ***By feature*** radio button to generate an index using this method. ***Feature*** based indexing functions by referencing every grid cell that the feature that is labeled passes through. Note that only features that have labels can be indexed. For example if "High Street" passes through Grid Cells A-3, A-4 and A-5, there would be several entries in the Index file:

High Street A-3
High Street A-4
High Street A-5

In the adjacent list box select the MAP Layer that was used to originally generate the labels, whether this was via Feature Text Label or MAP Tagger Tool. In the ***Attribute to match*** listbox, select the attribute column of the selected MAP Layer, which matches the labels you are indexing.

INDEX FILE FORMATTING OPTIONS

If you require the software to remove entries that are duplicates (i.e. street names named twice in the same grid cell) you should click the option to ***Remove duplicate entries***. If you are required to produce an index for several layers, you can choose to ***Include layer name*** when saving out the current layer. Each index entry will then have the name of the text layer included.

You must choose an option to ***Sort Output File*** by. This will be the ordering of your index entries. The default is the ***feature label*** itself, meaning for example, countries starting with '***A***' will be listed first. Alternatively, you can choose to index by ***grid cell***, meaning labels inside the cell marked '***A-1***' will be listed first.

The Index maker also provides an option to specify an ***Entry Delimeter***, being the form of the separator between grid cell and text label for each index entry. You can choose from ***Tab***, ***Comma***, or specify a custom (***Other***) delimeter (such as a dash or colon).

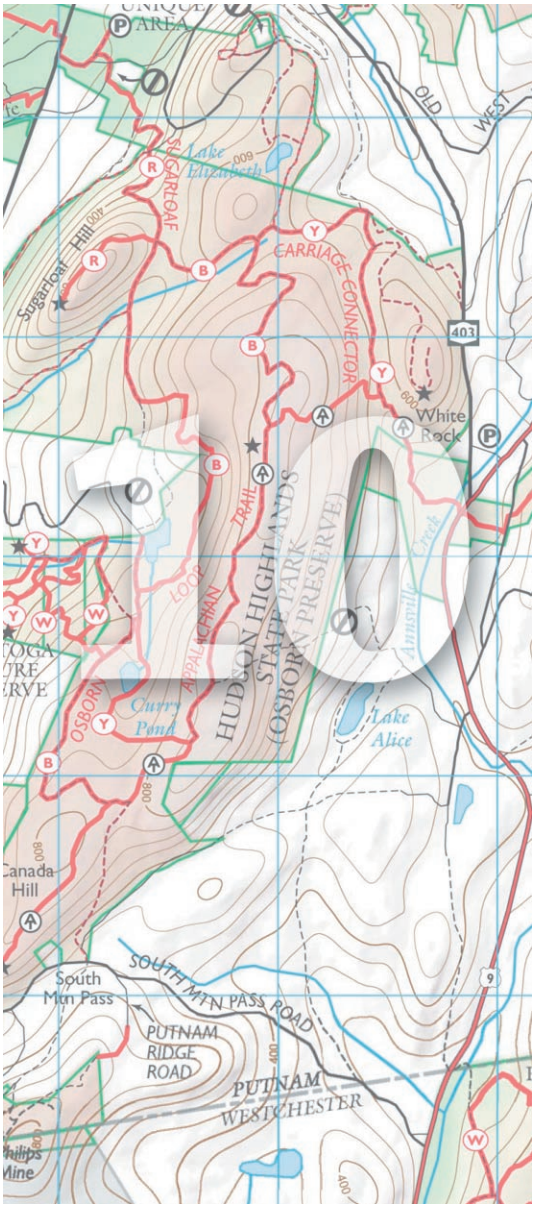
SAVING THE INDEX FILE

When you have set all of your Index options, click the ***Save As*** button. This will allow you specify a name for the text file, and the location where it will be saved. You can open this file in a text editor, or place it back into document using Illustrator's ***Place*** function.

MAKE INDEX TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
9-iii ... Creating an Index: Feature Based
9-iv ... Creating an Index: Text Based

Chapter 10
Selection Statistics

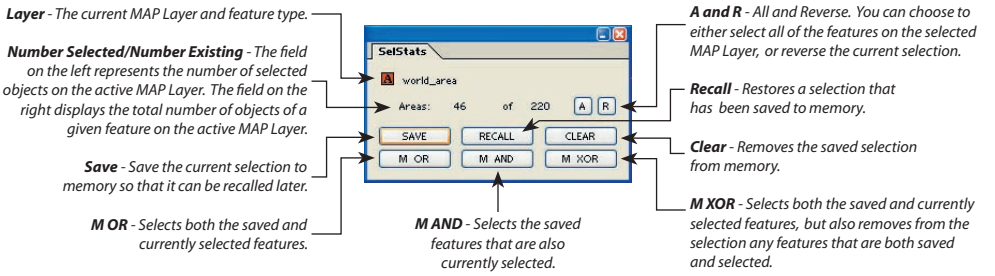


MAPublisher contains a tool for selecting data and viewing selection statistics graphically.

The **SelStats** tool can be used for quickly selecting all features contained in a MAP Layer, for viewing how many objects are selected at a given time, to save selections and to reverse selections.

SelStats

Window > MAPublisher Statistics > SelStats



USING THE SELSTATS WINDOW

Open the ***Selection Statistics*** window by going to *Window > MAPublisher Statistics > SelStats.* This window can also be opened by checking the *'Display Number Selected'* option in the Select by Attribute dialog (see pages 40 to 41).

LAYER STATISTICS

On initial opening, this palette will display the ***total*** number of Map features that exist on the current MAP Layer, as well as how many are currently ***selected***. As only one feature type is supported per MAP Layer, in MAPublisher 6, this dialog will only display the current feature type. Only MAPublisher objects will be displayed in the SelStats window. Objects that are in a [Non-map layer] in the MAP Views palette, will not be recognized in this window.

Selecting objects manually or via Select by Attribute will update the left hand field in this dialog. The right hand field will display the total number of Map features that exist on the current MAP Layer.

ALL OR REVERSE

The dialog offers a quick way to select all map features on the current layer. Simply click the ***A*** (All) button to select all the Map features on the current layer.

Clicking the ***R*** (Reverse) button will reverse the current selection, i.e. all the features that were selected will be deselected, and the features that were deselected will be selected.

SAVING SELECTIONS

The ***Save*** button will save the current selection to memory, allowing you to retrieve your selection again later. Only one selection can be saved, and it is limited to the current Illustrator session. A subsequent click on the ***Save*** button will overwrite the original saved selection.

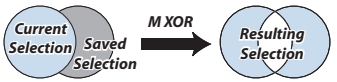
Clicking ***Recall*** will perform the selection that is saved to memory. Clicking ***Clear*** on the other hand, will remove the saved selection from memory.

ADDITIONAL SELECTION OPTIONS

This window also offers additional selection tools: ***M OR***, ***M AND***, & ***M XOR***.

Clicking the ***M OR*** button will select both the currently selected objects and the saved selection.

The ***M AND*** button will select the map features in the current selection which are included in the saved selection.

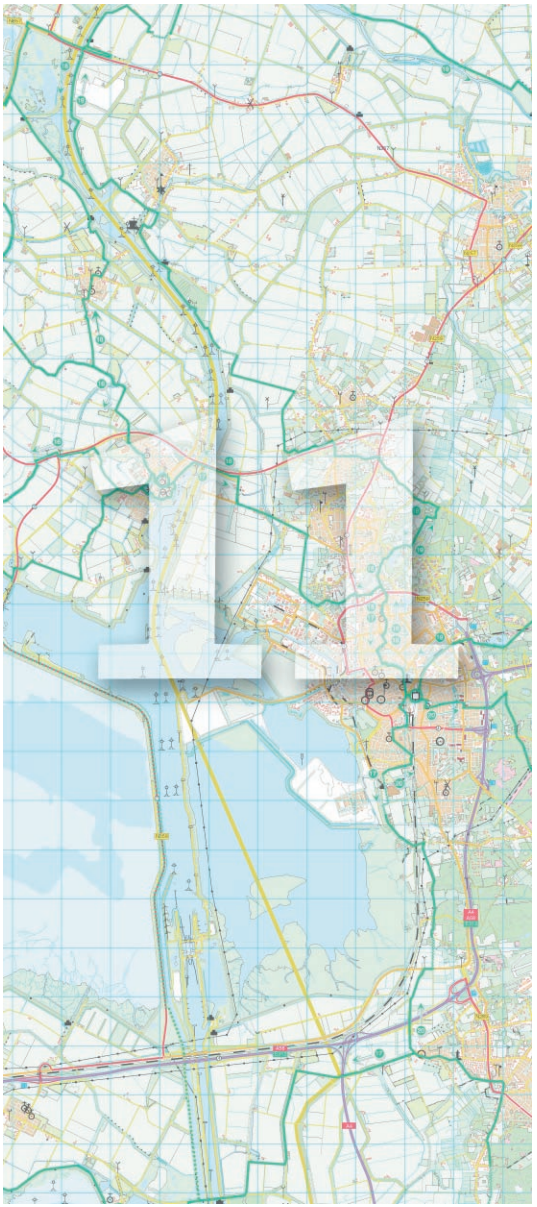


The ***M XOR*** button will select both the currently selected features and the saved selection if these selections do not overlap. However if the current selection includes any features that are part of the saved selection, those will be deselected when this button will is clicked.

SELSTATS TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
10-i ... Making Selections with SelStats

Chapter 11
Line Functions



MAPublisher contains several tools for working with Map Line segments.

As the graphics environment offers much more flexibility when working with vector artwork, MAPublisher offers graphics specific line tools, which will be discussed in detail in this chapter.

Buffer Selected Lines will allow you to create a buffer around current lines at designated distances in Map Units.

Flip Selected Lines can be used to swap the start and end points of lines if these line strings were not originally digitized in a preferable manner.

Spline Selected Lines will allow you to add Bezier curves to selected lines to assist in the manipulation and subsequent smoothing of paths.

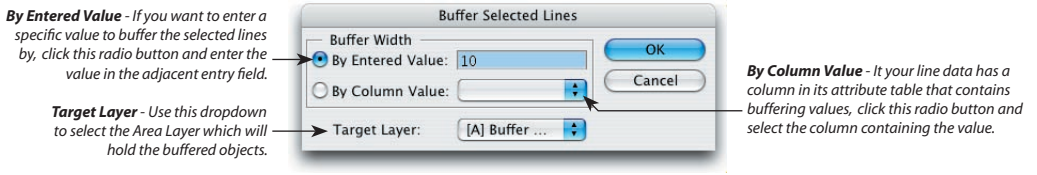
Join Lines can be used to connect line segments into continuous line strings based on a specified attribute column.

Simplify Lines will allow you to remove points and add Bezier curves to all or selected lines based on mathematical formulae.

Join Points will allow you to join point symbols based on attribute values. This tool will generate a line string joining common points, and is ideal for GPS data.

Buffer Selected Lines

Filter > MAP Lines > Buffer Selected Lines



FUNCTIONALITY

The MAPublisher ***Buffer Selected Lines*** filter creates buffer 'Area' objects around the linework. This can be useful if you are attempting to calculate distances on each side of a line. An example where you would use this tool could be in the planning of new roads, where the actual width of the highway is a major consideration.

PREREQUISITES

Your MAP Layer must be a ***Line Layer*** to use Buffer Selected Lines.

Before using this filter you must create an ***Area Layer*** in your Illustrator layers palette. Create a new layer, and then drag this to the MAP View which holds linework you wish to buffer, remembering to set the feature type to Area.

To use this tool, select the line(s) you wish to buffer, and then go to *Filter > MAP Lines > Buffer Selected Lines*.

USING BUFFER SELECTED LINES

You can choose to buffer lines by ***entering a value*** in the current Map Units of the layer, or by selecting an attribute ***column*** that contains ***buffer values*** in Map Units. The buffering value specified designates the total width of the new area object. For example, a value of 10 would create a buffer of 5 on either side of the selected line. This works on individual lines or a selected set of vectors. The buffer width will be calculated and created assuming the units of measurement to be the current map units.

When the Buffer Selected Lines filter is run with the ***By Column Value*** option checked, an area width is calculated based on the value(s) related to the selected object(s) in the attribute table. The area will then be constructed based on the line's attribute value.

When the filter based is run based on an ***Entered Value***, an Area object is created as calculated by the specified value, in map units.

Finally choose your ***Area Layer*** in the Target Layer section to place the buffered area object(s) on this layer.

BUFFER LINES TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
11-i ... Buffering Lines Using an Entered Value

Flip Selected Lines

Filter > MAP Lines > Flip Selected Lines

FUNCTIONALITY

The MAPublisher ***Flip Selected Lines*** filter switches the beginning and end points of a line.

Labeling linework in Adobe Illustrator is designed to position labels starting at the beginning of a line, and the orientation of the text depends on the starting point of the line or arc being labeled. As a result, cases can occur where labels are placed upside down or backwards from where you would like them.

In order for the labels to be consistent for a group of lines, flipping some of the lines may be necessary. MAPublisher's ***Feature Text Label*** (page 72) and ***MAP Tagger Tool*** (page 74) provide an option to ***Keep Text Above Lines***. However, there may be situations where you wish to flip these lines manually; for example if you are manually entering text on your lines.

You can flip lines on ***Line Layers*** and ***Area Layers***. In order to use this filter, select the lines you wish to flip, and then go to *Filter > MAP Lines > Flip Selected Lines*

Note that if you have negative values for polygons in the 'MPArea' column of your MAP Attribute table, you can use Flip Selected Lines to convert the MAPublisher area calculation to a positive value. When exporting Area layers to GIS formats, polygon outlines must have a positive 'MPArea' value.

FLIP LINES TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
11-ii ... Flipping Lines

Spline Selected Lines

Filter > MAP Lines > Spline Selected Lines

FUNCTIONALITY

The ***Spline Selected Lines*** filter improves the smoothness of curved lines and modifies the points on a line in order to add extended handles. These handles can be used to modify the shape of the lines, more commonly referred to as Bezier curves. Your MAP Layer must be a ***Line Layer*** to use this filter.

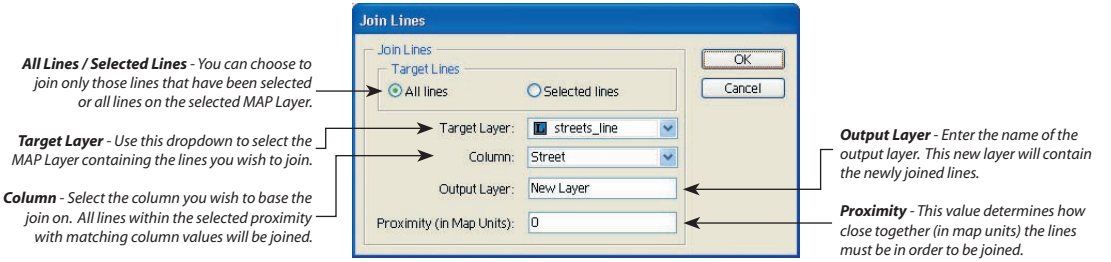
First select the lines you wish to spline, and then go to *Filter > MAP Lines > Spline Selected Lines*. The filter acts immediately to convert the selected lines to Bezier curves allowing them to be modified by dragging the handles that extend from each point.

SPLINE LINES TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
11-iv ... Smoothing Lines

Join Lines

Filter > MAP Lines > Join Lines



FUNCTIONALITY

The ***Join Lines*** filter lets you join a set of linear features based on a common value within an attribute column. For example, it may be desirable to join all segments of a particular street by the common attribute of street name in order to create a single line element representing that street. When the Join Lines filter is run a new layer is created containing the joined lines in order to avoid deleting other attributes within the original street layer. The new MAP Layer contains the joined lines with an attribute column representing the joined column.

Join Lines can be very useful for reducing the size of a data file by joining related lines and thus reducing the number of segments and associated data present in the file. It is also very useful to run Join Lines prior to labeling with ***Feature Text Label*** in order to eliminate the occurrence of duplicate labels.

PREREQUISITES

Join Lines can only function with ***Line Layers***, and can be used on both currently selected lines or all the lines on the currently selected layer. To open the dialog, go to *Filter* > *MAP Lines* > *Join Lines*.

USING JOIN LINES

From the ***Layer*** dropdown, select the ***Line Layer*** containing the lines you wish to join. Then specify if you wish to join ***All Lines***, or just the ***Selected Lines*** on this layer. This can be achieved by clicking the appropriate radio button.

In the ***Column*** dropdown, select the attribute column containing the attributes you wish to join together. For example to join lines based on street name, you should select the column containing the street names. This will result in line segments containing the same street name being joined together*.

In the ***Output Layer*** field you should specify a name for the new  ***Line Layer*** that MAPublisher will create to hold your joined lines.

A ***Proximity*** value should be entered. This value should be entered in the current units of your Line Layer. Note that entering a proximity value of zero, will only join line segments that are touching.
**If the distance between the end of a segment, and the start of another is greater than the proximity value you enter, these lines will not be joined.*

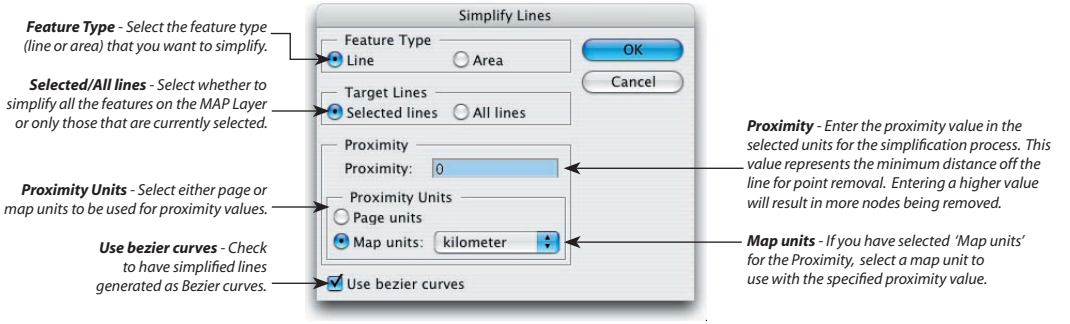
When you have entered your preferences for the join click the OK button. On the newly created Line Layer view the layer's attributes in the ***MAP Attributes*** window. Note that the only attribute columns present are the default ***MPLength*** column and the attribute column you specified for your join.

JOIN LINES TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
11-iii ... Joining Lines Based on Attribute Value

Simplify Lines

Filter > MAP Lines > Simplify Lines



FUNCTIONALITY

The MAPublisher ***Simplify Lines*** filter allows for the simplification or generalization of imported vector data based upon map or page units. The Simplify Lines function uses the popular Douglas-Peucker algorithm for removing nodes and vertices during simplification. For more information on the Douglas-Peucker algorithm see page A1/40.

Simplify Lines is used to reduce the number of points required to represent a vector-encoded digitized line where the lines are approximated by a stream of X-Y coordinates. The function can be used on ***Line*** or ***Area*** layers and removes nodes based upon a proximity value in either ***Map*** or ***Page Units***.

The simplify tolerance (***proximity*** value) is based on the vertical difference between the begin-end line and points off a line, NOT the distance between anchor points on the line. The Douglas-Peucker algorithm takes the proximity value you give it and iterates through the line vertices to determine the points that fall within the specified tolerance distance off the line and removes those vertices. Once all vertices are determined to be greater than the proximity value off the line the processing ends. A smaller proximity value will generally result in a fewer number of nodes being removed.

USING SIMPLIFY LINES

To open the dialog go to F*ilter > MAP Lines > Simplify Lines*. Specify if the Feature Type is ***Line*** or ***Area***, and if you wish to simplify ***All Lines*** on the current layer, or just the ***Selected Lines.*** Decide if you wish to enter a proximity value in ***Page Units*** or ***Map Units***. If you select Map Units you can select the unit from the dropdown. Page Units will be simply the units of the current document. Enter a proximity value in the units you have specified.

Check ***Use bezier curves*** if you wish to generate curves where nodes have been removed. *Note that many GIS applications do not support bezier curves. If you are planning to export your map to GIS formats you may need to use Illustrator's Add Anchor Points function.*

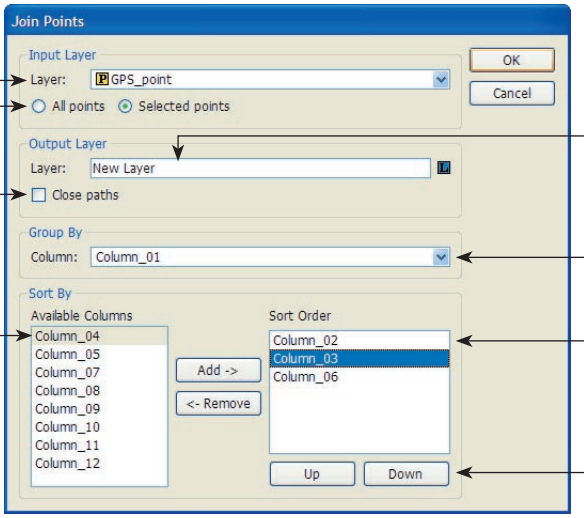
It is always a good idea to experiment with different proximity values in order to achieve the desired results particular to your scale and coverage area.

SIMPLIFY LINES TUTORIAL

Please refer to exercise *11-v:"Simplifying Lines"* in the Tutorials PDF.

Join Points

Filter > MAP Lines > Join Points



Input Layer *- Use this dropdown to select the Point Layer containing the symbols you wish to join.*

All Points / Selected Points *- You can choose to join only those points that have been selected or all points on the selected MAP Layer.*

Close paths *- Check this option to generate an Area layer. If unchecked, a Line layer will be generated.*

Sort By Available Columns *- Select an attribute column containing ascending values to sort by. Then click the 'Add' button to add the column to the Sort Order.*

Output Layer *- Enter the name of the output layer. This new layer will contain the new lines.*

Group By *- Specify the attribute column containing similar values to determine each group of points.*

Sort Order *- Contains a hierarchical list of the columns specified to sort by. To remove a column from the Sort Order, click the 'Remove' button.*

Move Up / Move Down *- You can move columns up and down the Sort Order hierarchy by clicking the appropriate button .*

FUNCTIONALITY

The new ***Join Points*** filter lets you join a set of point symbols with a line string based on sorting criteria which exist in the attribute structure of the point layer. For example, it may be desirable to join points that were originally generated by a GPS device, in order to create line elements connecting these points. When the Join Points filter is run a new layer is created containing a line linking each set of common points, with the generated layer containing the same common attribute column that was used to group the points together.

PREREQUISITES

Join Points can only function on P ***Point*** layers, and can be used on both currently selected point symbols or all the point symbols on a specified layer. There must be at least two attribute columns on the specified point layer in order to use Join Points. To open the dialog, go to *Filter > MAP Lines > Join Points*.

USING JOIN POINTS

From the ***Input Layer*** dropdown, select the ***Point Layer*** containing the points you wish to join. Then specify if you wish to join ***All Points***, or just the ***Selected Points*** on this layer, by clicking the appropriate radio button.

Specify a name for the ***Output Layer*** that this function will generate. By default, the program will generate a L ***Line*** layer. To generate an A ***Area*** layer (by linking the line end to the start) check the ***Close paths*** option.

In the ***Group By Column*** dropdown, select the attribute column containing the common attributes you wish to join together. For example to join points based on a unique ID, you should select the column containing the common ID names. This will result in point symbols containing the same name being joined together.

As each point that is joined will be represented by a node in a line string you must now specify a logical order by which the points will be joined. For example, it is logical that the point which was captured by a GPS unit first should be at the first node in the line string, with the second and third points being located at the second and third nodes. In order to specify these parameters, you must choose columns by which to sort your points. These should be attribute columns which contain rising alphabetical or numerical values.

In the ***Sort By Available Columns*** list, select the primary sorting column. This should be the attribute column that contains the best fit for rising alphabetical or numerical values. For example if points have rising values from 1 - 10, the point with a value equal to 1 will be at the start of the generated line, and the point with a value equal to 10 will be at the end of the line. When you have selected the column, click the ***Add*** button to place the column into the ***Sort Order*** list. If all the values contained in the first 'Sort By' column are unique, you will not be required to set a secondary column.

If the first 'Sort By' column contained any similar values, you must specify a secondary column. Again click on a column in the ***Sort By Available Columns*** list, and then click the ***Add*** button to place the column in the ***Sort Order*** list. Similarly third, fourth and fifth 'Sort By' columns can be specified in the same manner if previous columns contain similar values. Note that the 'Sort By' columns are a hierarchy with the topmost specified column being used for the primary sort, then the second, then third etc.

To move columns up or down the hierarchy after they have been specified, simply select the appropriate column in the Sort Order list and click either the ***Up*** or ***Down*** button.

To remove any 'Sort By' columns from the hierarchy, select the column in the ***Sort Order*** list and click the ***Remove*** button.

Note that a maximum of 5 columns can be used to sort points into a logical order. If the columns specified to sort by do not distinguish an ordering between certain points, the order of these points in the attribute table (i.e. the order in which they were digitized) will be used to determine the order of the nodes in the generated line string.

RESULTS

When you have set all your options, click the ***OK*** button to join the points on the specified layer. An ***Area*** or ***Line*** layer will be generated, depending on the specified output layer type, which will be placed in the same MAP View as the Input Point layer which has been joined.

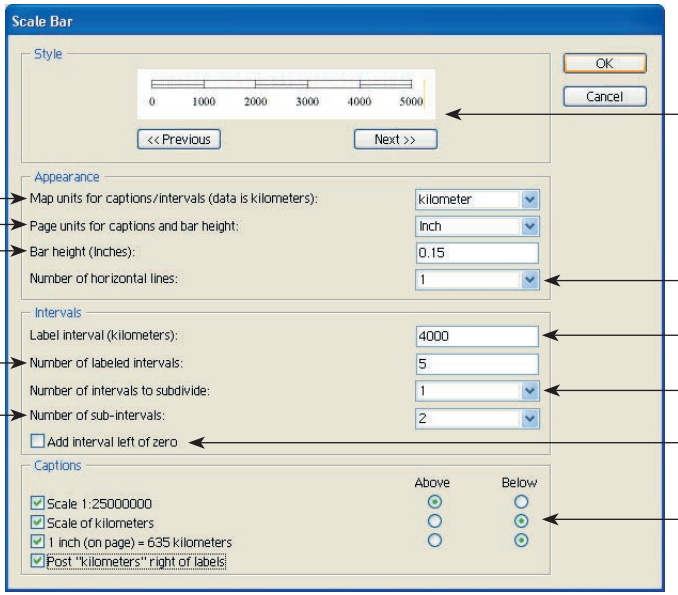
Chapter 12
Scale Bars and North Arrows

MAPublisher contains tools for plotting accurate scale bars and north arrows onto your map.

Both the **Scale Bar** and **North Arrow** tools offer a number of different designs that you can choose from, and can be placed into your MAP View by using the parameters of the current coordinate system.

Scale Bar

Filter > MAP Legend > Scale Bar



Map units for captions/ intervals *- Select the desired map units to be displayed in the caption of your scale bar. The text in brackets indicates the units of the map data layer.*

Page units for captions and bar height *- Select the desired page units to be used for the captions in your scale bar and to determine the bar height.*

Bar height *- Enter the desired height of your scale bar in page units.*

Number of labeled intervals *- Enter the desired number of intervals for the scale bar.*

Number of sub-intervals *- Select the number of sub-intervals for each subdivided scale bar interval.*

Select Style *- Use the Previous & Next buttons along with the Scale Bar Preview Panel to select the desired scale bar.*

Number of horizontal lines *- Select the desired number of horizontal lines to be included in the scale bar. Used with certain scale bar styles only.*

Label interval *- Enter the desired interval for the scale bar labels in map units.*

Number of intervals to subdivide *- Enter the number of scale bar intervals to be subdivided.*

Add interval left of zero *- Check this box to have an interval placed on the scale bar to the left of the zero mark.*

Caption Options *- Select the desired display format for the scale bar caption along with the location (above or below the scale bar) of the caption.*

FUNCTIONALITY

MAPublisher contains seven different ***Scale Bar*** designs that you may incorporate into your map. All MAPublisher Scale Bars are grouped text and vector art and can be edited as desired.

PREREQUISITES

To accurately place a Scale Bar your selected layer must contain accurate georeferencing information. The MAP Layer on which you intend to place your Scale Bar must be a ***Legend Layer***, and be selected and unlocked. It is also advisable to set your default text size and font before opening this dialog.

The Scale Bar dialog can be accessed by selecting *Filter > MAP Legend > Scale Bar.*

ADDING A SCALE BAR

STYLE

Use the ***Previous*** and ***Next*** buttons to select the Scale Bar design you require.

APPEARANCE OPTIONS

In the ***Map Units for captions/intervals*** listbox specify the units that you wish the Scale Bar to be based on. By default the captions and intervals in the Scale Bar will be in the units of your current layer. However you can change them here if desired. The choice you make here will affect your choices in the ***Interval Options*** section.

In the ***Page Units for captions and bar height***, specify ***Inch***, ***Centimeter*** or ***Millimeter.*** This unit is used to specify the height of the scale bar, and also the comparative scale text that you can choose to add to the Scale Bar in ***Caption Options***.

Using the Page Unit you specified, specify a height for your Scale Bar in the ***Bar height*** field. Depending on the style of Scale Bar you have chosen, you can also specify ***1***, ***2***, or ***3***, as the ***Number of horizontal lines*** that will compose the Scale Bar.

INTERVAL OPTIONS

In the ***Label interval*** field, specify a real-world distance that each interval of the Scale Bar will represent. This figure will be in the Unit you specified in the ***Map Units*** dropdown.

Specify the number of intervals or cells in the Scale Bar by entering a figure in the ***Number of labeled intervals*** entry field.

If you wish some of the intervals or cells in the Scale Bar to be additionally subdivided, choose a figure from the ***Number of intervals to subdivide*** listbox. The subdivided cells will begin from the left of the Scale Bar. The ***Number of sub-intervals*** that compose these cells can be specified in the next dropdown, and you can choose to subdivide by up to ***10*** segments.

You can also choose to ***Add an interval left of zero*** by checking that option.

CAPTION OPTIONS

The Caption Options section allows you to add extra information to the generated Scale Bar. The text that will be generated by this tool is indicated in this section. Other than the option to post the Map Units to the right of the labels, all other caption options can be placed ***Above*** or ***Below*** the Scale Bar by clicking the appropriate radio button.

RESULTS

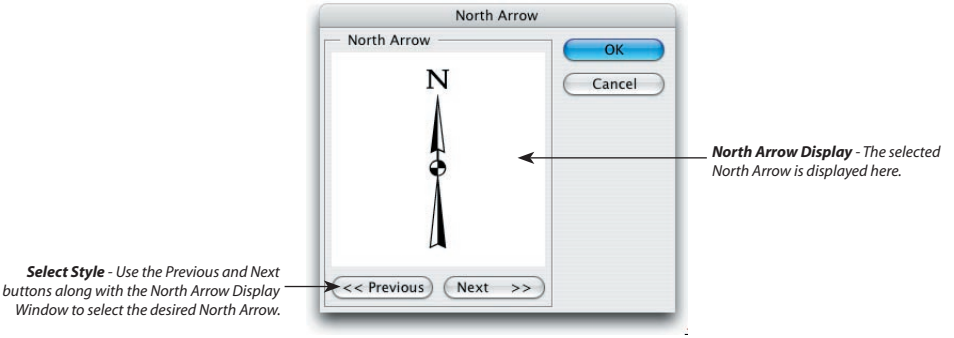
When you click ***OK*** the selected Scale Bar will be placed on the currently selected layer. You can use Illustrator's editing tools to move the Scale Bar to a desirable location, and to change its colours, fonts etc.

SCALE BAR TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
12-i ... Creating a Scale Bar

North Arrow

Filter > MAP Legend > North Arrow



FUNCTIONALITY

MAPublisher contains eleven different ***North Arrow*** styles that you may incorporate into your map. All MAPublisher North Arrows are pieces of grouped vector art and can be edited as desired.

PREREQUISITES

The MAP Layer on which you intend to place your North Arrow must be a ***Legend*** layer, and be selected and unlocked. This Legend layer must be hosted by the ***MAP View*** that you wish to base the alignment of your North Arrow on. The North Arrow dialog can be accessed by selecting *Filter > MAP Legend > North Arrow*.

ADDING A NORTH ARROW

Use the ***Previous*** and ***Next*** buttons select the North Arrow design you require. When you click ***OK*** the selected North Arrow will be placed on the currently selected layer. The coordinate system of the host MAP View will be used to align the North Arrow correctly.

NORTH ARROW TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
12-ii ... Creating a North Arrow

Chapter 13
Working With Images

MAPublisher contains tools for working with geographic raster images such as aerial photography and satellite imagery.

The **Register Image** filter allows you to accurately register raster images, with or without georeferencing information, to your vector map data.

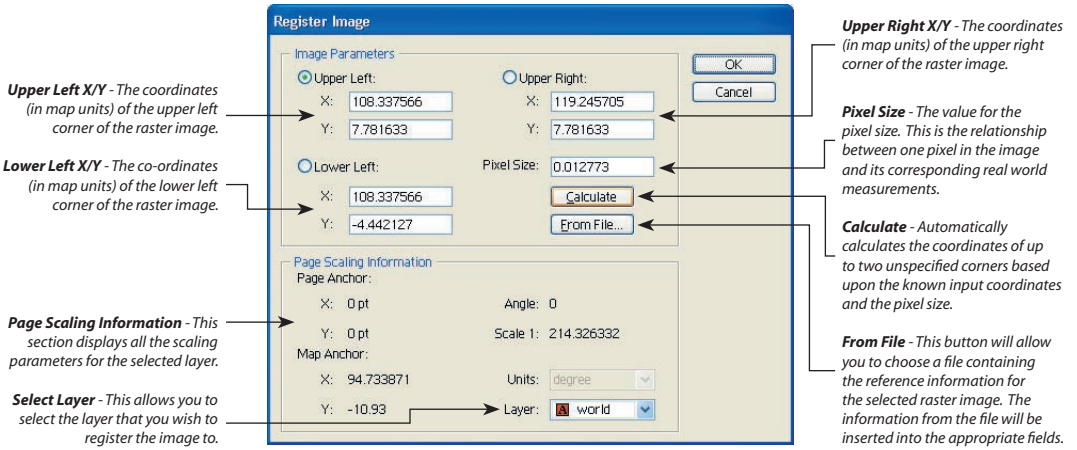
The **Export Image** filter provides the functionality to export raster images with georeferencing information attached.

Georeferencing information for such images are usually stored in a separate text file (except GeoTIFF) where the image and its associated reference file have the same file name but a different file extension.

The reference file formats that can be read by Register Image, or written to by Export Image are:
Image Report (*.irp)
TIF World (*.tfw)
JPEG World (*.jpw) *(Register Image only)*
Table (*.tab)
Listgeo (*.lgo)
GeoTIFF (*.tif) (a single file containing both the image and its reference data)

Register Image

Filter > MAP Images > Register Image



FUNCTIONALITY

The ***Register Image*** filter is used to accurately register raster imagery to your vector data. MAPublisher will study the parameters of the raster image, and the coordinate system of a selected ***MAP Layer,*** in the registration process.

PREREQUISITES

In order for this filter to be functional the raster image MUST be in the same projection as the ***MAP Layer*** you wish to register it to. You must therefore check the projection of your imagery with your data provider before attempting to use Register Image. It is possible to reproject vector data in MAPublisher first (see the ***MAP View Editor*** on page 49), if you require your linework to match your imagery.

When you are certain that both your ***MAP Layer*** and your raster image are in matching projections, you can place the image into Illustrator. It is often useful to first set up a special layer to hold your images. Therefore create a new layer and drag it into the ***MAP View*** containing your vector layers. As this new layer will be holding the Image only, you can assign any feature type when you drag the layer to your intended ***MAP View***. Use Illustrator's ***Place*** function (*File > Place*) to select the image and place it onto your new ***MAP Layer*** at a default location.

With the image selected go to *Filter > MAP Images > Register Image* to open the dialog.

USING REGISTER IMAGE

THE DIALOG AT A GLANCE

The dialog is split into two halves. The top half requires the input of parameters for the image. The lower half of the dialog will display the georeferencing information of the selected MAP Layer.

'PAGE SCALING INFORMATION' SECTION

To begin, select the ***MAP Layer*** that contains the coordinate system you wish to register your image to. This can be achieved by selecting a layer from the dropdown in the Page Scaling Information section.

'IMAGE PARAMETERS' SECTION

In this section you have three choices. You can either:

a) Select a Reference file containing the georeferencing information for the image by clicking the ***From File*** button.
b) Manually enter the ***Upper Left***, ***Lower Left*** and ***Upper Right*** coordinates for the corners of the Image, as well as the ***Pixel Size***.
c) Manually enter the coordinates for one corner of the Image as well as the ***Pixel Size*** for the Image. Leave the fields for the other two corners empty and click the ***Calculate*** button.

To Select a Reference file click the ***From File*** button and navigate to the folder containing your reference file. The reference file will normally be of the same name as your image, but will have the extension *.irp, .tfw, .jfw, .tab, .lgo,* or. *tif.* If your image is a GeoTiff you should select your image file in order to retrieve georeferencing information, as files of this type will contain both the image and its reference data. Select your reference file and click ***Open***. The values contained in this reference file will be entered automatically into the ***Image Parameters*** section.

If you are aware of the coordinates of the ***Upper Left***, ***Lower Left*** and ***Upper Right*** corners of your image you can enter them manually in this section. However you must also enter a ***Pixel Size***, which is the scale factor of one pixel to its corresponding real world measurements.

If you are aware of the coordinates of one corner of your image and the pixel size of the image you can enter these values into the dialog. Click the radio button next to your known corner and clear the values from the X and Y fields for the other two corners. Then simply click the ***Calculate*** button. MAPublisher will then automatically calculate parameters for the other two corners based on the values you have entered.

RESULTS

When you are confident that all values have been entered correctly into the ***Image Parameters*** section, and the values in the ***Page Scaling Information*** are correct for your related MAP Layer, you can click the ***OK*** button.

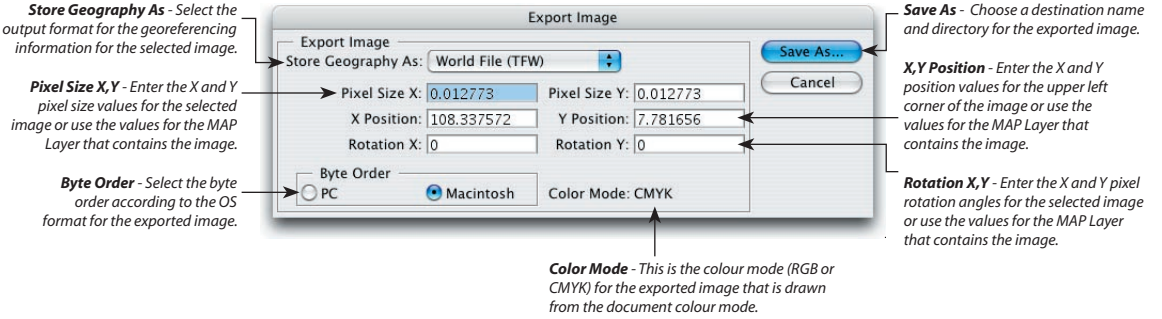
Providing the coordinate systems of the raster image and the MAP Layer match, and the values you have either entered manually or via a reference file are correct, the image will be scaled and positioned to coincide with your vector data.

REGISTER IMAGE TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
13-i ... Registering an Image with a Reference File
13-ii ... Registering an Image without a Reference File

Export Image

Filter > MAP Images > Export Image



FUNCTIONALITY

MAPublisher 6 offers the ability to export previously placed raster files as georeferenced images for use in other programs and/or for archival purposes. This can be useful in a number of ways. For example, when working with an image for which there is no georeferencing file you can use the MAPublisher ***Export Image*** function to create a GeoTiff or other georeferenced image file based upon the coordinate system of the host MAP View.

The ***Register Image*** filter can be used to accurately position imagery to your vector data. Alternatively you can manually move, scale or rotate imagery to align with artwork in a designated MAP View. If your host MAP View contains accurate georeferencing information, you can use Export Image to save out raster data to a fully georeferenced image format. It is also possible to convert your vector artwork to a georeferenced raster image, which will be discussed in Tutorial #2 of this section.

MAPublisher will export the selected image as a TIF, with a choice of the five reference file formats as discussed at the start of the Working With Images section.

PREREQUISITES

Before attempting to export your image you should check that the ***Colour Mode*** of your document is set to the desired colour mode that you wish to export your image to. Therefore any image exported using Export Image will be created in either ***RGB*** or ***CMYK***. With the Image selected go to *Filter > MAP Images > Export Image.*

USING EXPORT IMAGE

PIXEL SIZE AND ROTATION VALUE SETTINGS

The dialog will automatically populate the ***Pixel Size X and Y***, the ***X and Y Positions***, and the ***Rotation X and Y*** fields with the parameters of the selected image in the current coordinate system of the ***MAP Layer*** on which the image is placed. You can also enter these values manually if you require.

The ***Pixel Size X and Y*** fields refer to the scale factor of one pixel to its corresponding real world measurements.

The ***X and Y Position*** fields are for the input of the Upper Left corner of the image in the coordinate system of the host MAP Layer.

The ***Rotation X and Y*** fields should contain rotation values for the selected image if these apply.

COLOUR MODE AND BYTE ORDER SETTINGS

The current document colour mode is displayed in the ***Color Mode*** field. This will be the designated colour mode that the image will be exported in, and should not be edited. The image will always be exported in the current colour mode of the document, whether this is ***RGB*** or ***CMYK***.

The ***Byte Order*** will be set by default depending on whether you are using the Mac or Windows version of MAPublisher. You can change this if the image is to be used in the alternative operating system.

'STORE GEOGRAPHY AS'

The ***Store Geography as*** dropdown will list the five available reference file formats. A regular ***TIF*** file will be generated with a reference file carrying the extension ***TFW***, ***IRP***, ***TAB*** or ***LGO*** if you choose one of these formats. If you select ***GeoTiff*** from this dropdown only the ***TIF*** file will be produced, as this will carry both the image and the georeferencing information.

RESULTS

When you have set all of your export options, click the ***Save As*** button. This will allow you specify a name for the TIF file, and the location where it will be saved. If the format is a TIF and reference file combination, the reference file will carry the same file name and will be saved to the same location as the TIF.

You can subsequently use this image file in other GIS applications or in other Illustrator documents using MAPublisher.

EXPORT IMAGE TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
13-iii ... Exporting a Placed Image as a Georeferenced Raster File
13-iv ... Converting an Illustrator Vector File to a Geo-Image

Chapter 14
Working With Tables

MAPublisher includes several filters and tools for importing and viewing external data tables and for joining external tables with pre-existing map attribute tables. If, for example, you had a map of areas representing postal zones and an external data file containing sales or population figures by postal zone, the MAPublisher table filters would be used to import the external file and join it with the pre-existing postal zone map so that the sales or population figures would form part of the map attributes table for that layer.

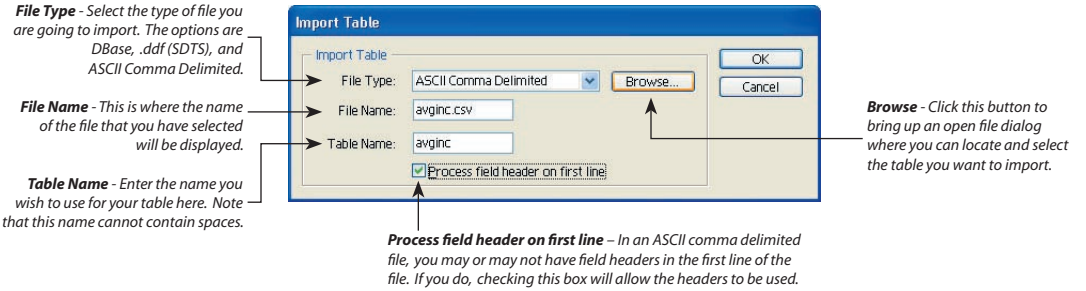
MAPublisher will automatically generate an *MPTables* layer that will store all imported or created tables. Note that deleting the *MPTables* layer will result in the deletion of all currently stored tables.

The following pages will deal with the creation, viewing and management of tables, as well as the joining of external tables to the attribute table of the map data via the use of the following tools:

Import Table
Table Records
Table Columns
Join Table
Select Table Records
Create Table
Delete Table

Import Table

Filter > MAP Tables > Import Table



FUNCTIONALITY

The MAPublisher ***Import Table*** filter lets you import external data tables to merge with existing map data attribute tables in order to create a single extended table comprised of the elements of both tables.

The MAPublisher Import Table filter provides support for three of the most common table formats as follows:
- **DBase** (*.dbf)
- **USGS SDTS** (*.ddf)
- **ASCII Comma Delimited** (*.csv) (*.dat) (*.asc) (*.txt)

USING IMPORT A TABLE

To import a table go to *Filter > MAP Tables > Import Table*.

Select the type of file you wish to import from the ***Type*** dropdown, and then click ***Browse***. This will open a browser allowing you to navigate to and select the file you wish to import. Select your file and click ***Open*** to return to the Import a Table dialog. The file you are importing will be shown in the ***File Name*** field.

The ***Table Name*** entry field will be populated with a default name based on the file selected for import. You can edit this field if required. Note that table names cannot contain spaces. If you require a space you must use the underscore (_) instead.

If your table contains column names as headers, click the ***Process field header on first line*** checkbox. If your file does not contain headers do not select this option, which will result in the default of Column1, Column2, etc, being the names of the columns that compose the imported table.

Click ***OK*** to import the selected table. MAPublisher will create an ***MPTables*** layer in your Illustrator layers palette, which will hold the imported table. You can view the attributes and column structure of your table in the ***Table Records*** and ***Table Columns*** windows (see page 107).

IMPORT TABLE TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
14-i ... Importing a Table

Table Records / Table Columns

Window > MAPublisher Tables > Table Records
Window > MAPublisher Tables > Table Columns

Table Records window

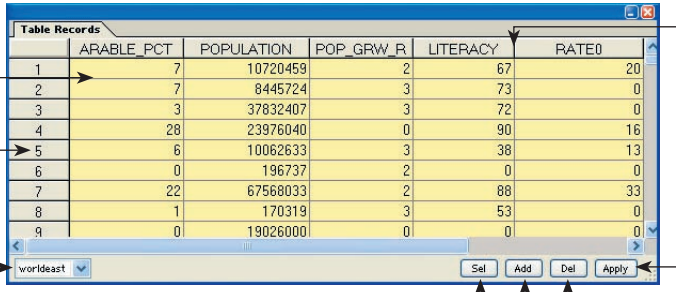


Table Records *- This is the area in which the Table Records are displayed.*

Row Number *- A unique number for each table entry. Click the row number to select a row or shift select a number of rows in order to delete.*

Table Selection *- If you have imported or created a number of tables, select the table you wish to view with this list.*

Click and drag to resize the columns.

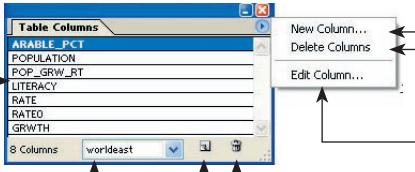
Apply *- If you have made any changes to the attribute table, you must click here to apply them, otherwise any changes you made will be discarded when the window is closed.*

Del *- Deletes the selected record from the table.*

Sel / All *- Use this button to toggle between viewing the whole table and viewing only those records that have been selected using Select Table Records.*

Add *- Adds a new blank record to the end of the table. Once a blank record has been added, you can enter values into each of its fields.*

Table Columns window



Column List *- List of columns that comprise the currently selected table.*

Table Selection *- If you have imported or created a number of tables, select the table you wish to view with this list.*

New Column *- Click this button to begin adding a new column.*

Delete Column *- Click this button to delete the currently selected column(s).*

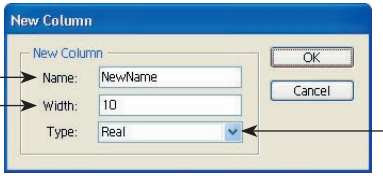
New Column *- Select this option to begin adding a new column.*

Delete Columns *- Select this option to delete the currently selected column(s).*

Edit Column *- Select this option to edit a selected column.*

New/Edit Column

*This dialog will open when clicking '**New Column**' or '**Edit Column**'.*



Name *- Specify or Edit the name of the column here.*

Width *- Specify or Edit a width in characters for the column.*

Type *- Specify the type of column* (Character, Integer, Real, Boolean) to create (* Can only specify when creating a new column).*

FUNCTIONALITY

Table Records and ***Table Columns*** allow you to view and edit data tables which exist on the ***MPTables layer.*** These functions will open in the same palette allowing you to use the tabs to toggle between the two windows, and are accessed by going to *Window > MAPublisher Tables > Table Records OR Table Columns.*

USING THE TABLE RECORDS WINDOW

This window lets you display the ***Table Records*** for a table or for selected parts of it. Only the records of a single table will be displayed in the window at a given time. If multiple tables exist on the ***MPTables*** layer, you can toggle between these tables by choosing from the ***Table dropdown***. Also the values displayed in the ***Table Records*** window may be sorted by column value by double-clicking on the column heading, and the widths of the columns may be changed by clicking on the column separator and dragging it as desired.

EDITING RECORDS

MAPublisher's ***Table Records*** window is a fully editable spreadsheet environment. All table entries can be edited. To change the value of a cell double-click on the cell and enter the new value such as you would in a spreadsheet program. Keep in mind that you must enter values that correspond with a column's type (i.e. only enter numbers into a column of type "Real"). After making the changes click the ***Apply*** button to set the edits permanently into the map file's database record. Closing the window without clicking Apply will discard any changes you have made. *Note: Mac users only - After making edits to cell values within the Table Records window you should click in an alternate cell in the Table Records window before clicking the **Apply** button, otherwise the edits may not be recorded.*

ADDING AND DELETING RECORDS

The Table Records window also allows you to Add or Delete table entries, by clicking the ***Add*** or ***Del*** buttons respectively. To delete single table entries click the row number at the left of the window and click the ***Del*** button. To delete multiple table entries shift select the rows before clicking this button. Adding a table entry will place a new row at the top of the window.

SELECTING SPECIFIC RECORDS

In order to view table entries selected in ***Select Table Records*** (page 114) click the ***Sel*** button. When these elements have been selected, the button will change to ***All***, allowing you to click again to view all the contents of the table.

USING THE TABLE COLUMNS WINDOW

The Table Columns window allows you to view, edit, create and delete table columns. Only the records of a single table will be displayed in the window at a given time. If multiple tables exist on the MPTables layer, you can toggle between these tables by choosing from the ***Table dropdown***.

ADDING, DELETING AND EDITING COLUMNS

Any changes you make within the ***Table Columns*** window will instantly update the ***Table Records*** window.

To add a new column click the ***New*** button at the base of the window, or go to *Options* > ***New Column***. This will open a dialog allowing the specification of a ***Name***, ***Width*** (in characters) and a column ***Type***. Imported tables will have up to four types of attribute columns, and these principals must be considered if you add columns to a table using the New Column function. The column types are ***Character***, ***Integer***, ***Real*** and ***Boolean***.
Character columns will contain attributes that are alphanumeric, for example columns containing letters or numbers, or a combination of both.
Integer columns contain only whole numbers.
Real columns contain numbers carrying decimal values.
Boolean columns contain purely True or False values.

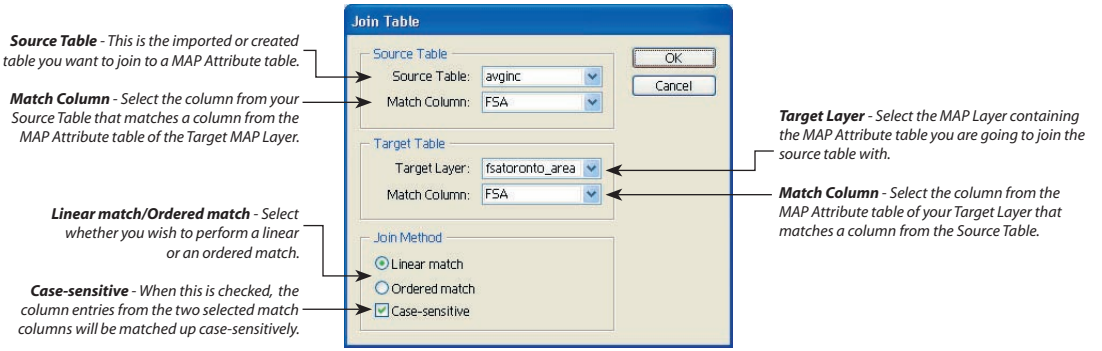
To edit the properties of a column select the column and go to *Options* > ***Edit Column***. Note that if you decide to edit the properties of a column via the *Edit Column* palette option, you will be unable to change the column type.
To delete a column or number of columns, select the column(s) in this window and click the ***Delete*** button, or go to *Options* > ***Delete Columns***.

TABLE RECORDS & TABLE COLUMNS TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
14-ii ... Viewing, Editing, and Deleting Table Records
14-iii ... Adding a New Column to a Table

Join Table

Filter > MAP Tables > Join Table



FUNCTIONALITY

The MAPublisher ***Join Table*** filter joins an imported or created data table to a selected target MAP Layer based upon common or matching fields and columns. The matching columns are not required to have matching names.

PREREQUISITES

To use Join Table you must have both a ***MAP Layer*** and a ***Data Table*** which contain one common attribute column that contains similar fields. View the attributes of each attribute table using the MAP Attributes & Columns windows, and the Table Records & Columns windows. If you have a matching column, proceed to this dialog by going to *Filter > MAP Tables > Join Table.*

USING JOIN A TABLE

THE DIALOG AT A GLANCE

The Join Table dialog is split into two sections. The upper section deals with the parameters of the ***Source Table***, i.e. the data table that is contained on the ***MPTables layer***. The lower section is for the input of parameters for the destination layer, i.e. the ***Target Table*** that is connected to the vector features on a ***MAP Layer***.

SOURCE TABLE SETTINGS

Select the data table that you wish to join to the attributes of the vector data. This can be achieved by choosing a table on the MPTables layer from the ***Source Table*** dropdown. In the ***Match Column*** dropdown, choose a Column of the data table that contains the fields you wish to match to the destination attribute table.

TARGET TABLE SETTINGS

Choose the attribute table that you wish to join the data table to. This can be achieved by choosing a ***MAP Layer*** from the ***Target Layer*** dropdown. In the ***Match Column*** dropdown, choose a Column in the attribute table of the MAP Layer that contains the fields you wish to match the Source Table to.

JOIN METHOD SETTINGS

Choose if you require a ***Linear match*** or an ***Ordered match***.

Linear match will result in a slower matching process than setting it to Ordered Match but the Source Table and Target Table do not have to be sorted first.

Ordered match is faster but requires that the records in both the Source Table and Target Table are pre-sorted on the Match Columns so that like (matching) values are in the same position.

If the ***Case-sensitive*** option is checked, the column entries from the two matching columns will only be matched by case. For example if you have a mixture of upper or lower case entries in the data table that is mirrored in the destination attribute table you should check this box. If one of the matching columns contains values in lowercase, and the other contains values in uppercase, for example, you should not check this box.

RESULTS

When you click ***OK*** the data table on the MPTables layer will be added to the attribute table on the destination ***MAP Layer***. To view the addition of these attributes, open the MAP Attributes window. Notice that the matching column in your data table has also been added, but has been appended with a ***'J'*** (for 'Joined'). This column can be removed in the MAP Columns window if you require.

Note there is additional information regarding Joining SDTS Tables, on page A1/37.

JOIN TABLE TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
14-iv ... Joining a Table to a MAP Attribute Table

Select Table Records

Filter > MAP Tables > Select Table Records

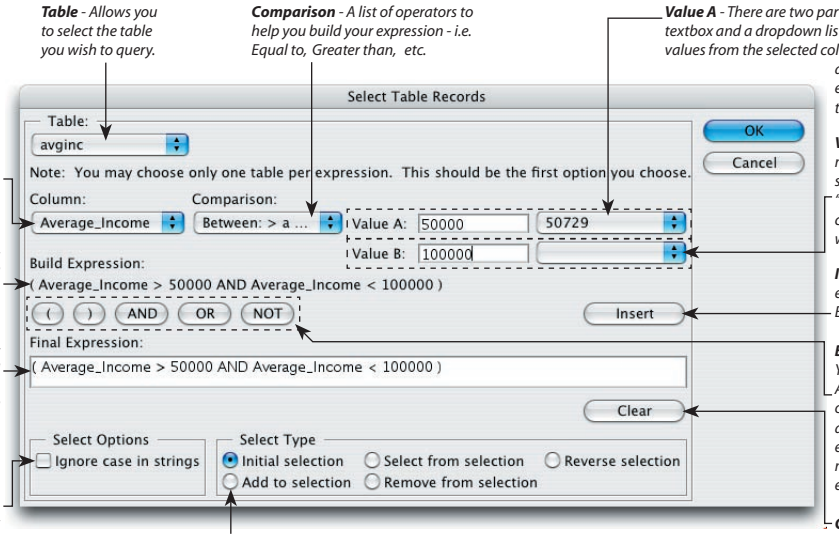


Table *- Allows you to select the table you wish to query.*

Comparison *- A list of operators to help you build your expression - i.e. Equal to, Greater than, etc.*

Value A *- There are two parts to this parameter - a textbox and a dropdown list containing all unique values from the selected column. You can select a value from the list or enter one manually in the textbox.*

Column *- Select the column on which you wish to base your query.*

Value B *- These are only made available if the selected comparison is a "Between" type in which case the second value will be entered here.*

Build Expression *- Displays the current expression. This will update if you change the expression's parameters.*

Insert *- Moves the build expression into the Expression box.*

Final Expression *- After clicking Insert, the Build Expression is moved into this box. This is the final expression that will be assigned to the elements when you click OK.*

Boolean Operators *- You can use brackets, AND, OR and NOT operators to create a more complex expression involving multiple inserts of build expressions.*

Ignore case in strings *- If this is checked, any expression that compares string (non-numeric) values will be case insensitive.*

Clear Expression *- Clears the expression box allowing you to insert a new expression.*

Selection Type *- There are 5 types of selections you can make -* ***Initial*** *(used when nothing is currently selected),* ***Add to*** *(used when you need to add to the current selection),* ***Remove from*** *(used when you need to remove features from the current selection),* ***Select from*** *(where you limit the features being searched to those already selected) and* ***Reverse*** *(where the current selection is simply reversed).*

FUNCTIONALITY

The MAPublisher ***Select Table Records*** filter allows you to select a particular set of records from an imported or created table. The selected fields can be viewed when opening the ***Table Records*** window and clicking the ***Sel*** (Select) button. This function is very similar to ***Select by Attribute*** (page 40) where selections are made based on attribute information. A particular column is selected and then a logical expression is built defining the desired features for selection.

PREREQUISITES

To use Select Table Records you must have a data table that exists on the ***MPTables layer***. Open the dialog via *Filter > MAP Tables > Select Table Records*.

USING SELECT TABLE RECORDS

ENTERING EXPRESSIONS

In the dialog you must first select the data table on which you want to make a selection by choosing from the ***Table*** listbox. Then select an attribute ***Column*** in the data table, a ***Comparison***, and a choice of ***Values***, in order to build an expression. Values can either be entered manually or by choosing from the dropdowns. The ***Expression*** will be displayed as you make selections and enter values in the ***Build Expression*** section.

When the expression has been built you must click the ***Insert*** button. The ***Boolean Operator Buttons*** can be used if you wish to use multiple columns or values in order to generate an expression. If you make a mistake at any time, click the ***Clear Expression*** button.

SELECTION OPTIONS

This filter has five selection options: ***Initial selection***, ***Add to selection***, ***Remove from Selection***, ***Select from selection*** and ***Reverse select***.

Initial selection is used when there is no current selection.
Add to selection will add the results of the query to any currently selected features.
Remove from selection will remove the results of the query from the current selection.
Select from selection will only query those features that have already been selected.
Reverse select will select the features that do not match the specified expression.

Select Table Records also contains an option to ***Ignore case in strings***. If this option is checked, any expression that compares non-numeric values will not differentiate between characters in upper and lower case.

RESULTS

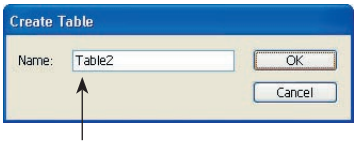
When you have entered a valid expression, click ***OK*** to make your selection. Then open the ***Table Records*** window and click the ***Sel*** button to view the selected fields. Click the same button again (it will now be named ***All***) to return to the full attribute list. You can subsequently toggle back and forth between ***Sel*** and ***All***.

SELECT TABLE RECORDS TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
14-v ... Selecting Specific Table Records

Create Table / Delete Table

Filter > MAP Tables > Create Table
Filter > MAP Tables > Delete Table



***Name** - Enter the name of your new table in this field. Note that this name should not contain spaces.*

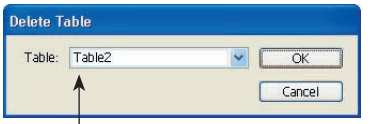


***Table** - Select the existing table you wish to delete.*

CREATING NEW TABLES

MAPublisher allows you to also create your own custom tables to merge with existing map data attributes. New tables can be created by going to *Filter > MAP Tables > Create Table*. Specify a ***Name*** for your new table and click ***OK***. If you do not previously have an ***MPTables*** layer, this operation will create one. You should then use ***Table Records*** and ***Table Columns*** to build the attributes for your new table.

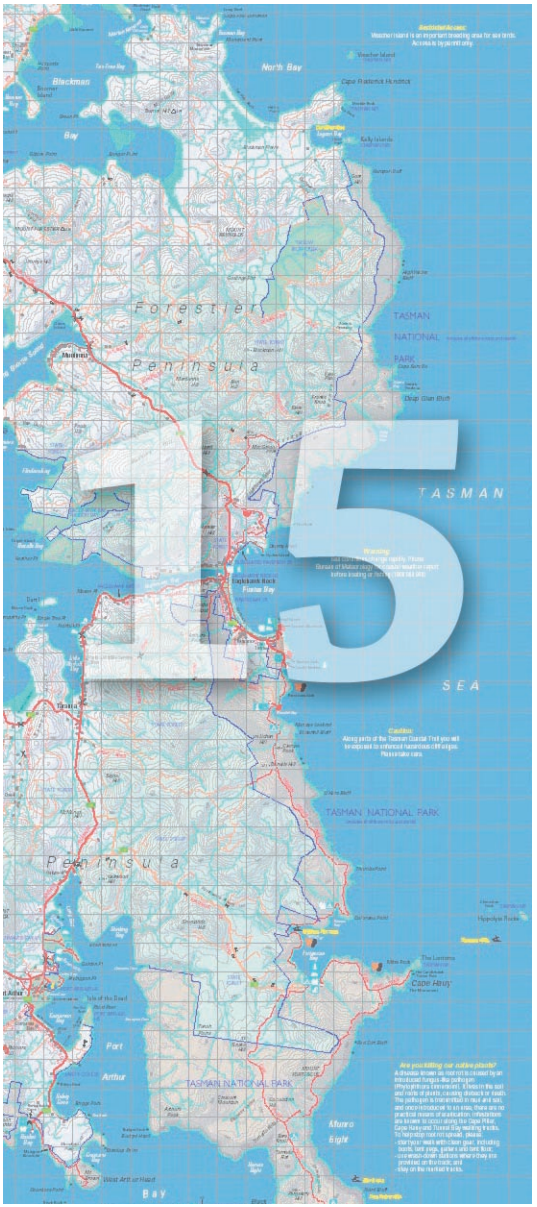
DELETING TABLES

Similarly you can easily delete any previously imported or created tables. Open the dialog by going to *Filter > MAP Tables > Delete Table*. Select the ***Table*** you wish to delete and click ***OK***. Note that MAPublisher will not delete the ***MPTables*** layer even if all the tables have been deleted. You must remove the ***MPTables*** layer manually by using Illustrator's ***Delete Layer*** function.

CREATE & DELETE TABLE TUTORIALS

Please refer to the following exercises in the Tutorials PDF:
14-vi ... Creating a New Table
14-vii ... Deleting a Table

Chapter 15
Drawing Tools

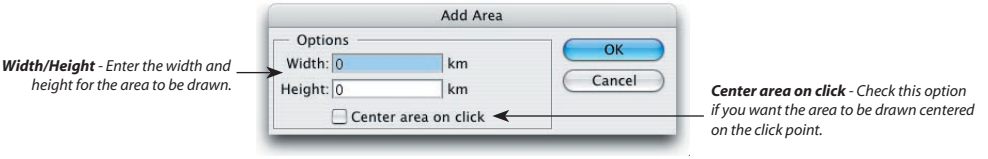


In MAPublisher 6, any artwork you create on a specified MAP Layer using Illustrator's drawing tools will be incorporated into the map data on that layer, and can therefore be rescaled or reprojected with the existing data. If the new artwork is of the same feature type as the MAP Layer, they will be automatically added to the attribute table of that layer. Therefore it is very easy to quickly add features to MAP Layers.

MAPublisher also provides two if its own tools, which are designed to draw rectangular or elliptical areas of specified dimensions in Map Units. The **MAP Area Tools** will be discussed in this section.

MAP Area Tools

Main Toolbar > MAP Area Tool (Box)
Main Toolbar > MAP Area Tool (Ellipse)



FUNCTIONALITY

By using the ***MAP Area tools***, areas of exact map dimensions can be quickly added to any MAP Layer and its related attribute table. This tool can also be useful for measuring distances from a specific location, by using the MP attribute column(s) in the ***MAP Attributes*** window. Whenever an area is created using the MAP Area tools, any objects that fall inside the area (in whole or part) will be automatically selected.

PREREQUISITES

In order for the area tools to draw properly and return real world values for ***MPArea*** and ***MPPerimeter***, the MAP Layer must be projected (i.e. not in Lat/Long). See the ***MAP View Editor*** (pages 51-53).

MAPublisher offers ***Ellipse*** and ***Rectangle*** drawing tools. Select whichever shape you require from the main Illustrator ***Tools*** palette, and select the MAP Layer in the Illustrator ***Layers*** palette which contains the coordinate system on which you want to draw the shape.

USING THE MAP AREA TOOLS

OVERVIEW

There are two methods of using the MAP Area tools. As with Illustrator shape tools you can either click and drag to create a shape at an unspecified size. Alternatively you can single click in the MAP document to open the ***Add Area*** dialog, where you specify exact width and height values for the shape.

DRAWING VIA CLICK AND DRAG

To draw shapes at unspecified sizes, click and drag over the Map document while holding down the left mouse button until the desired area has been outlined, as is done with the standard Illustrator area drawing tools. Use the ***Alt*** key (Windows) or the ***Option*** key (Mac) to draw from the centre and/or the ***Shift*** key to constrain the proportions. When you release the mouse button the area will be created.

ENTERING SPECIFIC DIMENSIONS

To draw shapes at specified sizes, single click at a point in your Map document at the location from which you wish to plot the shape. The MAPublisher ***Add Area*** dialog will appear into which you can enter specific dimensions for the area to be drawn. The parameters you enter should be in the same units as your current MAP Layer.

If you wish to have the area centered over the click point simply check the ***Center area on click*** box. If you do not check this box an area will be drawn from its upper left corner.

Click ***OK*** to plot a shape using the dimensions you entered.

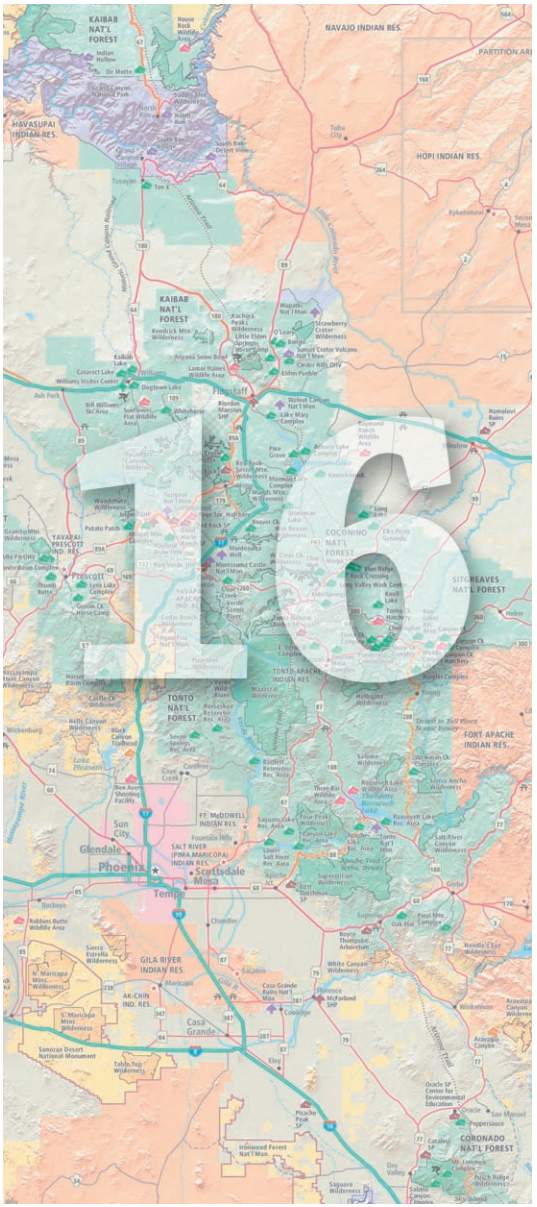
RESULTS

Plotting a shape using either of these methods will initially select the features that fall, inside the area (in whole or part). Therefore, these tools can be also useful for selecting features that are within designated distances away from a central location.

MAP AREA TOOLS TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
15-i ... Creating Shapes with Specific MAP Dimensions

Chapter 16
Layer Management



Managing the often large amount of layers that compose a mapping project is crucial for minimizing file size and for assisting in projects passed between several individuals or departments.

The *Merge Layers* function described in the MAP Views chapter assists for the combining of whole Illustrator layers. However there may be scenarios where you wish to move certain graphics only into alternate layers. MAPublisher offers functionality to move data safely between layers using its own Copy and Paste tools.

The **Copy MAP Object** and **Paste MAP Object** functions will be discussed in this section.

MAP Copy & Paste

Object > MAP Copy Object > Copy MAP Object(s)
Object > MAP Copy Object > Paste MAP Object(s)

FUNCTIONALITY

The MAPublisher ***MAP Copy/Paste*** function is designed to safely copy and paste MAPublisher objects between MAP Layers while retaining the geographic and attribute characteristics of the objects. In order to copy and paste map data safely you should use the MAP Copy and Paste Object tools which can be found under *Object > MAP Copy Object*. Copying and pasting MAPublisher objects using the native Illustrator Copy and Paste functions may result in the loss of attribute and geographic data for the objects involved. MAP Copy and Paste will also allow for non-MAPublisher objects to be copied and pasted independently or in conjunction with MAPublisher objects.

The difference between this function and the Merge Layers tool (see page 48) is that selected artwork can be merged with another layer, rather than all the data on a particular layer.

PREREQUISITES

An important point to remember prior to using MAP Copy/Paste is that in order for this function to perform correctly, both the destination and output layer (i.e. the layer you are copying from, and the layer you are pasting to), must have identical georeferencing information. The safest methodology to use is to only copy and paste between layers that exist inside a single MAP View.

Regarding attribute information, note that if the destination and output layer both have attribute structures, these attribute structures must match. Check the attribute structures of both layers by using the MAP Attributes and MAP Columns windows. However, you can also safely copy attribute information if the destination layer does not contain any attribute information, as is the case with a new MAP Layer.

USING MAP COPY AND PASTE

To select an object or group of objects for copying simply select the desired objects using any of the Adobe Illustrator or MAPublisher selection tools and then go to *Object > MAP Copy Object > Copy MAP Object(s)*. The objects will then be placed on the clipboard.

To paste the chosen object(s) to another layer select the destination layer from the Illustrator layers palette and then select *Object > MAP Copy Object > Paste MAP Object(s)*. The objects will then be placed on the destination layer. Pasted objects are placed in the same location on the document from where they were copied. Note that the *Paste MAP Object(s)* menu item will be greyed-out and inaccessible if a MAPublisher Paste operation is not permitted.

Note that objects may NOT be copied and pasted between documents using the MAP Copy/Paste tools. Also objects that have been deleted prior to having been pasted on a new layer will not be copied to the new layer. If you wish to remove objects from the initial layer you must delete them AFTER pasting them to the new layer.

MAP COPY AND PASTE TUTORIAL

Please refer to the following exercise in the Tutorials PDF:
16-i ... Copying and Pasting between MAP Layers

Appendices

Graphic File Formats

AI

The *Adobe Illustrator* (AI) native postscript file format. Please refer to the Adobe Illustrator User Guide for more information.

DOQ

Digital Orthophoto Quadrangle (DOQ) are geographic images from the United States Geological Survey (USGS) and are stored in the JPG format. They can be placed by Adobe Illustrator and registered by the MAPublisher Register Image filter. DOQ's are usually very large files (30-40 MB or more) and will require extremely large amounts of RAM.

DRG

Digital Raster Graphics (DRG) are scanned images of published topographic maps from the USGS stored in TIF format. They can be placed by Adobe Illustrator and registered by the MAPublisher Register Image filter. DRG's are also usually very large files (30-40 MB or more) and will require extremely large amounts of RAM for any manipulation within Illustrator.

EPS

The *Encapsulated Post Script* (EPS) file is used to transfer PostScript language artwork between applications (also see PostScript in the glossary section of the User Guide). EPS files are easily opened by Adobe Illustrator because the format is widely supported by most graphics programs. It is the preferred format for export to most illustration and page-layout programs. EPS files are by their nature vector based, but can contain embedded raster graphics and fonts.

GIF

Graphic Interchange Format (GIF) is a colour-indexed graphics format, commonly used for web pages and image file transfer. Adobe Illustrator can export 8-bit indexed-colour or grayscale gifs.

JPEG

Joint Photographic Experts Group (JPEG or JPG) is a compression technique for raster file formats. The Digital Orthophoto Quadrangle geographic images from the USGS are stored in this format, which can be imported by Adobe Illustrator and registered by the MAPublisher Register Image filter. DOQ's are usually very large files (30-40 MB or more) and will require extremely large amounts of RAM.

PDF

Portable Document Format (PDF) is a standardized format developed by Adobe for use across Macintosh, Windows, DOS, and UNIX platforms. Based on the PostScript Level 2 language, PDF supports both raster and vector graphics.

TIFF/GEOTIFF

Tagged Image File Format (TIFF or TIF) is a common raster graphic file format that can be imported by Adobe Illustrator. Many raster geographic images from GIS systems are stored in this format, which can be imported by Adobe Illustrator and registered by the MAPublisher Register Image filter. A GeoTIFF is a TIFF file with embedded geographic information identifying its position and scale in world co-ordinates.

OTHERS

Please refer to the Adobe Illustrator User Guide for other graphics file formats supported by Adobe Illustrator.

MAPublisher Import Formats

This section contains descriptions of the GIS formats supported for import by MAPublisher using the FME engine. Here you will find an overview of the structure of each format, as well as information on supported format versions and elements unique to each data type. Each file format will carry a checklist covering which core elements are supported by MAPublisher during its import. You can also refer to the Frequently Asked Questions section in this guide for information on any issues associated with the various file formats. Also see the File Formats section on pages 20 to 22.

FME documentation on these formats can be found by visiting the following link:
http://www.safe.com/products/fme/formats/index.php

AUTOCAD DRAWING (*dwg) and DRAWING EXCHANGE (*.dxf)

There are two formats used by AutoCAD: DXF (drawing exchange format) files, which are large; and ASCII representations of the binary DWG (drawing) files. Logically, both files are identical and, therefore, the FME treats both file types in the same manner.

Supported Elements	
Typical File Extensions	*.dwg, *.dxf
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	No
Generic Colour Support	Yes
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type Attribute	autocad_entity

Supported Geometry	
Aggregate	No
Circles	Yes
Circular Arc	Yes
Elliptical Arc	Yes
Ellipses	Yes
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	Yes

Supported Versions
Windows: Releases 09 to 14, 2000, and 2004.
Macintosh: Releases 09 to 14, and 2000.

Prior to the import process, additional Settings can be made, which will affect how the selected file will import. The following parameters can be applied to the import:

- ***Group Entities*** - Group entities by Layer Name, Geometry or build Attribute Schema by scanning extended entity data. The default is to Group Entities by Layer Name.
- ***Blocks*** - Check this box if you want to explode blocks and return the entities that form the components of the block as separate features. The default is Yes (to Expand Info Entities).
- ***Visual Attributes*** - Check this box if you want each visible attribute to be returned as a single text feature. The default is Yes (to Expand Info Text Entities).
- ***Paper Space*** - Setting to 'Read' will instruct MAPublisher to also read the entities from paper space. By default, MAPublisher will only read the entities from model space.
- ***Bulge Handling*** - Determines how AutoCAD curves are handled on import. By default, the arcs are approximated by splitting them into a series of connected segments (vectorized). In rare cases when the number of points on the map becomes a critical consideration, an approximation with smooth Bezier curves can be specified. Note that this method is not precise and may introduce visible inaccuracy for the points along the curve, so it should only be used when a high amount of precision is not a consideration.

ESRI ARCINFO EXPORT (*.e00)

ArcInfo Export (e00) is a format, either ASCII or compressed into binary, which is used to transfer files between different versions of ArcInfo. It is a commonly found format for freely distributed data such as that found at the GIS Data Depot *(http://www.gisdatadepot.com)*.

A single E00 file describes a complete ArcInfo coverage. The file itself is actually an archive of several smaller files, referred to as subfiles. Some of these subfiles have fixed names which do not vary from coverage to coverage, and follow a predefined data format. The remainder of the subfiles contained within an E00 are the info files. These files may contain user-defined attributes, and have names which vary from coverage to coverage.

Supported Elements	
Typical File Extensions	*.e00
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes
Generic Colour Support	No
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type Attribute	e00_type

Supported Geometry	
Aggregate	No
Circles	No
Circular Arc	Yes
Elliptical Arc	Yes
Ellipses	No
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	Yes

There are essentially four types of geometry defined in E00 files, which will be reproduced as layers during import: Arcs (lines), Points, Polygons, and Text. Prior to the import process, an additional Setting can be made:

- ***Tic points layer*** - This option enables you to include an additional layer which will hold the registration points for the imported data. The default is to set to Yes.

ESRI ARCINFO GENERATE (*.gen)

ArcInfo Generate files are ASCII coordinate files created from ArcInfo coverages through the use of the ArcInfo Generate command. Generate is a useful mechanism that allows you to transfer ArcInfo GIS data to MAPublisher. There are several types of Generate files, and currently point, line, and text Generate files are supported. All Generate file names are required to end with a .gen extension.

Supported Elements	
Typical File Extensions	*.gen
Automated Translation	Yes
User-Defined Attributes	No
Coordinate System Support	No
Generic Colour Support	No
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type Attribute	arcgen_geometry

Supported Geometry	
Aggregate	No
Circles	No
Circular Arc	No
Elliptical Arc	No
Ellipses	No
Polygon	No
Donut Polygon	No
Point	Yes
Line	Yes
Text	Yes

ESRI SHAPEFILE (*.shp)

ESRI shapefiles are binary files used to export data with attributes from both ArcInfo and ArcView. Shapefiles store both geometry and attributes for features; however no topological information is carried in a shapefile.

A single logical shapefile consists of three physical files, each with one of the following file name extensions:

*.shp : Geometric data
*.shx : Index to the geometric data
*.dbf : Attributes for the geometric data

These extensions are added to the base name of the shapefile, creating separate physical files that must all reside in the same directory. You must select the *.shp file for import. Point, multipoint, polyline, and polygon geometric data can be stored in *.shp files. However, a single *.shp file can contain only one type of geometry. Each entity in a *.shp file has a corresponding entry in the *.shx index file and a corresponding row of attributes in the associated *.dbf file. The order of the entries in each of these files is synchronized. For example, the 3rd geometric entity in the *.shp file is pointed to by the 3rd entry in the *.shx index file and has the attributes held in the 3rd row of the *.dbf.

A single shapefile may also consist of a number of additional files, with the following file name extensions:

*.sbn / *.sbx : Spatial index files for the geometric data. These two files are only generating by an ESRI product.
*.prj : Spatial coordinate system information.

If a *.prj file exists in your shapefile directory, holding the projection information of the shapefile, this will automatically be read by MAPublisher on import. If your shapefile folder does not contain a .prj file you will be required to specify the projection in order to fully utilize MAPublisher.

Supported Elements	
Typical File Extensions	*.shp (*.shx, *.dbf, *.prj)
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes (if have *.prj)
Generic Colour Support	No
Spatial Index	Optional
Schema Required	Yes
Transaction Support	No
Geometry Type Attribute	SHAPE_GEOMETRY

Supported Geometry	
Aggregate	Yes
Circles	No
Circular Arc	No
Elliptical Arc	No
Ellipses	No
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	No

MAPINFO INTERCHANGE (*.mif/*.mid)

The MIF is a published ASCII format used by the MapInfo product for input and export purposes. The *MapInfo Reference Manual* describes the MIF format and all constants it uses for colour, style, symbol, and fill patterns. MapInfo Interchange Format Files are often called MIF or MIF/MID files.

A single logical MIF file consists of two physical files, having the following file name extensions:
*.mif : Geometric data
*.mid : Attributes for the geometric data

These extensions are added to the base name of the MIF file, creating separate physical files that must all reside in the same directory. You must select the *.mif file for import.
Each entity in a *.mif file has a row of attributes stored in an associated *.mid file. A single .mif file contains many different types of geometry however, the associated attribute in the *.mid file must have the same number and type of fields for each entity in the *.mif file. The order of the entries in the two files is synchronized. For example, the second geometric entity in the *.mif file has the attributes held in the second row of the *.mid file. The number and type of attributes associated with each entity is specified by the user. There must be at least one attribute field in the *.mid file.

Supported Elements	
Typical File Extensions	*.mif (*.mid)
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes
Generic Colour Support	Yes
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type Attribute	mif_type

Supported Geometry	
Aggregate	Yes
Circles	Yes
Circular Arc	Yes
Elliptical Arc	Yes
Ellipses	Yes
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	Yes

The MAPublisher MID/MIF importer supports the storage of point, line, polyline, arc, ellipse, rectangle, rounded rectangle, region (polygon), and text geometric data in .mif files. Each geometric entity present in a *.mif file has display properties such as pen and brush width, pattern, and color. Supported MID MIF properties are as follows:

MAPublisher 6 supports the import of line weights (0-7), colours (24 bit RGB), strokes (1-71). It also supports fonts (family, style, justification) for text. In order to use line patterns and fill patterns you must have opened or accessed the style library equivalents. Two library files have been created, '***MIF_LineStyles.ai***' & '***MIF_AreaStyles.ai***', which provide support for many of the standard MapInfo pen styles (stroke patterns) and brush styles (fill patterns). These files can be found in the utilities folder on your MAPublisher CD. Please refer to your Adobe Illustrator User Guide for details about how to add these libraries to your Adobe Illustrator Style palette.

MAPINFO TABLE (*.tab)

The MapInfo TAB format is a proprietary format used by the MapInfo Professional Desktop mapping product. MapInfo native format files are often called Tab files. The MapInfo TAB importer is closely patterned after the MapInfo MIF/MID reader and writer. This commonality makes it easy to support both MIF and MapInfo native formats in the same mapping file. MapInfo is a two-dimensional (2D) system with no provision for transferring elevation data for each vertex in a MapInfo feature.

A single logical TAB file consists of a number of physical files, having the following file name extensions:

*.tab : The main file for a MapInfo table, it is associated with the appropriate dat, map, id and ind files.
*.dat : Tabular data for a table in MapInfo's native format
*.id : An index to a MapInfo graphical objects (MAP) file.
*.map : Contains geographic information describing map objects
*.ind : An index to a MapInfo tabular (DAT) file

These extensions are added to the base name of the TAB file, creating separate physical files that must all reside in the same directory. You must select the *.tab file for import.

Supported Elements	
Typical File Extensions	*.tab (*.dat, *.id, *.map, *.ind)
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes
Generic Colour Support	Yes
Spatial Index	Always
Schema Required	Yes
Transaction Support	No
Geometry Type Attribute	mapinfo_type

Supported Geometry	
Aggregate	Yes
Circles	Yes
Circular Arc	Yes
Elliptical Arc	Yes
Ellipses	Yes
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	Yes

The MAPublisher TAB importer supports the storage of point, line, polyline, arc, ellipse, rectangle, rounded rectangle, region (polygon), and text geometric data in .tab files. Each geometric entity present in a *.tab file has display properties such as pen and brush width, pattern, and color. Supported TAB properties match those described for MID MIF files on the previous page.

MICROSTATION DESIGN (*.dgn)

MicroStation Design Files or DGN (.dgn) are the native files created by Bentley Systems Inc.'s MicroStation product. Design files consist of a header, followed by a series of elements. The header contains global information including the transformation equation from design units to user coordinates, as well as the dimension of the elements in the file. Each element contains standard display information, such as its colour, level, class, and style, as well as a number of attributes specific to its element type. For example, a text element has fields for font, size, and the text string in addition to the standard display attributes.

Individual design file elements must be less than a system-imposed maximum number of bytes. Complex elements solve this problem by physically grouping individual elements together into an object that will be manipulated as a whole. MAPublisher supports the import of complex shapes.

Supported Elements	
Typical File Extensions	*.dgn
Automated Translation	Yes
User-Defined Attributes	No
Coordinate System Support	No
Generic Colour Support	Yes
Spatial Index	Never
Schema Required	No
Transaction Support	No
Geometry Type Attribute	igds_type

Supported Geometry	
Aggregate	No
Circles	Yes
Circular Arc	Yes
Elliptical Arc	Yes
Ellipses	Yes
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	Yes

Supported Versions
Windows: 95, SE, J, V8. Macintosh: 95, SE, J.

Prior to the import process, additional Settings can be made, which will affect how the selected file will import. The following parameters can be applied to the import:

- ***Group Elements By*** - Choose how you want to group the elements of the file on import. If you group the elements by level, it may result in a large number of output files. '*By Level*' is the default.
- ***Linkage Extraction*** - Linkage Extraction boxes allows you to extract *MSLinks* and/or *FRAMME* attribute linkage values from the Source Design File. Only the first three linkage values will be extracted.
- ***Cells*** - Check '*Expand Cells*' if you want the cells expanded into separate features.
- ***Tags*** - Check this box to display tags. Elements in a design file may have user-defined attributes (tags) attached to them which can be read by MAPublisher.
- ***Coordinate Units*** -Choose *Master, Sub,* or *UOR* as the coordinate units of the features. '*Master*' is the default.
- ***Complex Strings*** - Check *'Drop'* if you want each component of a complex chain to be returned as its own feature. Otherwise all elements of the complex chain will be merged into a single linear feature. Check *'Propagate Member Linkages'* if you want the linkages attached to the first component of the complex chain to be returned on the MAPublisher feature, supplementing any existing linkages.
- ***Background Colour*** - Check *'Create black background'* if you wish MAPublisher to create a layer comprising a simple black fill, to mimic the common Microstation background.

TIGER/LINE (*.rt1) (*.bw1)

TIGER/Line files are a digital database of geographic features, such as roads, railroads, rivers, lakes, political boundaries, census statistical boundaries, etc., that cover the entire United States. The database contains information about these features such as their location in latitude and longitude, the name, the type of feature, address ranges for most streets, the geographic relationship to other features, and other related information. TIGER/Line files are the public product created from the Census Bureau's TIGER database of geographic information. More information on the TIGER/Line file format and data product can be found on the U.S. Census web page at: *http://www.census.gov/geo/www/tiger/*

This website contains a detailed description of the current TIGER/Line format, with an explanation of field meaning for each feature type. A detailed description of the TIGER/Line 1998 format, with an explanation of field meaning for each feature type, is available at: *http://www.census.gov/geo/www/tiger/tiger98.pdf*

FME considers a directory of TIGER/Line data files to be a dataset. Optionally the *.rt1 file may be used as a dataset. The directory may contain TIGER/Line files for one or more regions. The regions are counties, or county equivalents. Each county consists of a series of files with a common basename, and different extensions. Always select the *.rt1 or *.bw1 file for import.

Supported Elements	
Typical File Extensions	*.rt1, *.bw1
Automated Translation	Yes
User-Defined Attributes	Yes
Coordinate System Support	Yes
Generic Colour Support	No
Spatial Index	Never
Schema Required	Yes
Transaction Support	No
Geometry Type Attribute	tiger_type

Supported Geometry	
Aggregate	No
Circles	No
Circular Arc	No
Elliptical Arc	No
Ellipses	No
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	No

Supported Versions
1990, 1992, 1995, 1997, 1998, 1999, 2000, 2002

USGS DIGITAL LINE GRAPH (*.dlg) (*.opt)

DLG is a published ASCII format developed by the United States Geological Survey (USGS) Federal Agency and is intended to assist in data exchange with the National Digital Cartographic Data Base (NDCDB).
The DLG reader supports all three distinct types of DLG data:

- Large-scale DLG data (1:24,000-scale)
- Intermediate-scale DLG (1:100,000-scale)
- Small-scale DLG data (1:2,000,000-scale)

The three scales of DLG data are physically formatted into files in one of these ways: standard, optional, and graphics formats. MAPublisher supports both the standard and the optional DLG distribution formats; however the graphics format is not supported. Most DLG data is distributed in the optional format.

The DLG file structure was designed to accommodate all categories of spatial data represented on a conventional line map. Node, line, and area data types are present within the DLG format, along with linkages and attribute codes. Linkages are references to other features within the same DLG data set, used in a variety of contexts. DLG files do not explicitly store attribute values but use a feature coding approach in which unique feature codes are assigned to the different types of features stored within the data set. MAPublisher will look for the extension .dlg or .opt for the input DLG files.

Supported Elements	
Typical File Extensions	*.dlg, *.opt
Automated Translation	Yes
User-Defined Attributes	No
Coordinate System Support	Yes
Generic Colour Support	No
Spatial Index	Never
Schema Required	No
Transaction Support	No
Geometry Type Attribute	dlg_type

Supported Geometry	
Aggregate	No
Circles	No
Circular Arc	No
Elliptical Arc	No
Ellipses	No
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	No

USGS SDTS (*catd.ddf)

Spatial Data Transfer Standard (SDTS) is a standardized binary format used by the USGS for transferring earth-referenced spatial data between dissimilar computer systems that includes support for the inclusion of spatial data, attribute, georeferencing, data quality report, data dictionary, and other supporting meta-data within a single file transfer format. Files in the SDTS format will have the extension *.ddf. More information on this format can be found at: *http://mcmcweb.er.usgs.gov/sdts/*

A group of *.ddf files is normally identified by the catalog file, or *CATD.DDF file, which relates the files of a single SDTS transfer, and binds together all the files with a common prefix. Always select the SDTS file which ends in 'CATD', which is a new requirement in MAPublisher 6, i.e. "HP01CATD.DDF".

Supported Elements	
Typical File Extensions	*.ddf
Automated Translation	Yes
User-Defined Attributes	No
Coordinate System Support	Yes
Generic Colour Support	No
Spatial Index	Never
Schema Required	N/A
Transaction Support	No
Geometry Type Attribute	sdts_type

Supported Geometry	
Aggregate	No
Circles	No
Circular Arc	No
Elliptical Arc	No
Ellipses	No
Polygon	Yes
Donut Polygon	Yes
Point	Yes
Line	Yes
Text	No

Frequently Asked Questions

This section presents a number of frequently asked questions (FAQs) regarding the use of MAPublisher. If the answer to your particular question is not included here please consult the online FAQs at *http://www.avenza.com/freezone/freezone.faq.html* or the online MAPublisher Knowledge Base at *http://www.avenza.com/support.kb.html*. In addition, there is a valuable GIS FAQ database put out by the US Census Bureau at: *http://www.census.gov/geo/www/faq-index.html*

INSTALLATION ISSUES

All the MAPublisher filters are in the Plug-ins folder but they do not all show up in Adobe Illustrator.

Try exiting out of Adobe Illustrator, deleting the Adobe Illustrator preferences and plugin cache files, and then restarting Illustrator:

- In Windows the preferences and plug-in cache files are most often found in *C:\Documents and Settings\username\Application Data\Adobe\Adobe Illustrator XX*, but depending upon your version of Windows they may appear in the top level of the Adobe Illustrator folder. In either case they are named *'AIPrefs'* and *'Plug-in Cache'*.
- On the Macintosh OSX platform the preferences file is most often found in *Users\username\Library\Preferences\Adobe Illustrator XX*.

Also check under *Edit > Preferences > Plug-ins & Scratch Disks* and ensure that the correct location of your plug-ins folder is indicated.

Why can I not install to my Non-English version of Adobe Illustrator?

The Plug-ins folder in Non-English versions of Adobe Illustrator will be named differently. MAPublisher will automatically locate the Plug-ins folder in English, Dutch, French, German, Italian, Spanish and Swedish versions of Adobe Illustrator. For all other language versions of Adobe Illustrator, you will need to Browse for and select the equivalent to the Illustrator Plug-ins folder during the MAPublisher installation process.

I try to access the MAPublisher filters, but always receive a message saying MAPublisher cannot obtain a license. What should I do?

1. Check you have registered your copy of MAPublisher and received a license file. MAPublisher will fail to operate until you have received a license file for activation. For further details, please see page 15.
2. If you have purchased a Machine specific license (uncounted license) you must ensure the License file is located in the following directory:
   Windows: *Program Files\Adobe\Illustrator XX\Plug-ins\MAPublisher Plug-in*
   Macintosh: *Applications\Adobe Illustrator XX\Plug-ins\MAPublisher Plug-in*
3. If you have a try-out version of MAPublisher, check that your copy has not expired. To do this, locate the *.lic file in the directory listed above. Open this file in a simple text editor. On the second line will be details of the expiration date of your try-out version. Note that this file has been automatically generated by Avenza and therefore manually editing will not re-activate MAPublisher.

MEMORY & SPEED ISSUES

Why do I need so much more memory (RAM) than I do with my GIS?

The graphics software environment of Adobe Illustrator loads the entire file into memory rather than just reading it from disk, thus more memory is required. MAPublisher builds a mini-GIS application inside Illustrator so that it can geo-code information and attach data to objects. This also has some overhead. When you are importing a lot of files with MAPublisher into Illustrator, you'll notice that the amount of available memory will decrease rapidly and your computer loses speed. This is due to the memory management. MAPublisher reserves a fairly large amount of memory for each import-action, which is not always returned when the import is done. The solution is simple: save your file, close it and open it again. It's not even necessary to close Illustrator itself. By closing the file the reserved memory is properly returned.

How can I improve the speed of my data import?

Many GIS data files are large and when a series of such files is imported, you may find that the import filter starts to run more slowly. This is because scratch and memory allocations are being used up. Try the following suggestions:

- Periodically save your work then close and reopen the file. This will free up the available scratch memory.
- Reduce the maximum number of undos, since they all reside in memory.
- Set a grain value on import to drop redundant data points.
- See the Memory Considerations section for other suggestions, pages A1/20 to A1/21.

DATA IMPORT ISSUES

Why do my files appear squashed after import?

They are probably stored in geographic or lat/long co-ordinates. Data in lat/long usually looks "squashed". You can project them into an alternate map projection using the MAP View Editor (see pages 51-53).

What alternatives are there for importing a file format not supported by MAPublisher?

We provide a web page that has links to freeware, shareware and commercial GIS data translators at *http://www.avenza.com/support.links.html*. If you cannot find the translator that you need give us a call as we may have other suggestions.

Why do my shapefiles not import?

There are a couple of possible causes of this. The two items to check for are:

1. Make sure that you have all 3 required files. There should be a "triplet" for each layer/coverage with the extensions *.dbf, *.shp & *.shx. If you are missing any of these files you will not be able to import your files successfully.
2. If you have transferred these files from one operating system to another then you must always use binary ftp transfer, or the files may be corrupted. We have found that you cannot rely on the automatic transfer with all ftp utilities. Some do not recognize the files as being binary and will transfer them as ASCII.

I am having trouble getting my layers to overlay correctly. Both files import correctly when they are imported alone, but when I import the second file, they do not line up as expected.

They should overlay correctly. Probably they are in different projections or coordinate systems. It is very important that you ensure that data used within a single mapped area have the same map projection. If different data sets for a geographic location have differing projections, the chances are high that they will not overlay on import. If the files are of differing projections/coordinate systems, any software will give you the same results. If the projections are known, you can use the MAP View Editor filter to change all data to a common projection. For more information about map projections see the British Columbia Government Ministry of Environment tutorial on map projections at *http://srmwww.gov.bc.ca/gis/projectiontutorial.html*.

Why do my MapInfo files crash on import or do not import properly?

There are a couple of possible common causes of this. A couple of possibilities may be:

1. How did you transfer the file to the machine where it is being imported? If you have transferred these files from one operating system to another then you must always use ASCII ftp transfer, or the files may be corrupted. We have found that you can not rely on the automatic transfer with all ftp utilities. Some do not recognize the .MID files as being text. The .mid files may be inadvertently interpreted as binary music files, which often carry the same file extension. If they are transferred as binary you will have trouble importing them.
2. Were the files compressed? If the files are compressed using a windows ZIP format, you must be careful when decompressing them. If this is the case and the utility you used was Stuffit, you need to make sure that it was set for a DOS zip file or the file can be corrupted. The shareware utility ZIPIT found at *http://maczipit.com* has been found to be quite good for decompressing windows zip files.

I am having trouble with importing SDTS files. Where am I going wrong?

Be very careful how you receive a xxx.tar.gz file off the USGS website and decompress it. These files are in a binary format and if you use Smart TAR CR/LF translation it will not import and may cause errors in MAPublisher. Make sure that you do all FTP transfers as binary. After you receive it, use gzip to decompress it and TAR to further decompress it. You should have about 20 separate files, look for the ones that end in xxxxCATD.DDF.

Why does my data sometimes vanish?

If you imported some data and it appeared when selected, but when you deselected the data it seemed to vanish, here are a few things to check:

- You may have inadvertently pressed cut or the delete key. Check under Edit in the menu bar, if the "Undo Clear" task is available this means that you just deleted something. Select "Undo Clear," and the data should return.
- Check the order of your layers. Try moving the layer in question to the top of the list of layers in the Layers palette so that it is drawn on top of the other layers.
- Make sure that current layer is available for viewing in the Layers palette, by having a dot in the left-hand column under the eye (visualization) and beside the layer name.
- Check that you have colours for the fill and stroke set in the paint palette.
- Check the setting for the stroke width and increase if necessary.

EXPORTING ISSUES

How do I strip all the attributes from a MAPublisher file?
Simply drag your MAP Layers to into the default MAP View entitled *[Non-map layers]*, and all georeferencing and attribute information will be removed. Note that this function must only be used as a final step. You will be unable to recover attribute information after converting a 'MAP Layer' to a 'Non-map Layer'.

What causes missing features when exporting MAPublisher layers?
If you are using an pre-existing Adobe Illustrator file not created with MAPublisher you must correctly assign MAPublisher status to your layers and data. Only one feature type per layer is supported. The feature type icon next to your MAP Layer in the MAP Views palette is indicative of the features on that layer, and is the feature type which will be applied if the layer is exported. For example if you have Point symbols on a Line Layer, they will not be recognized as being MAPublisher objects and will be dropped in the export process.

Why is MAPublisher exporting the 'MPArea' column values as negatives?
Certain polygons may be displayed as negative areas in the '***MPArea***' column. Data that was originally digitized counterclockwise will contain negative values. When exporting Area layers to GIS formats, polygon outlines must have a positive *'MPArea'* value. If you have values for polygons in the *'MPArea'* column of your MAP Attribute table which contradict these guidelines, you can use *Flip Selected Lines* (page 91) to convert the MAPublisher area calculation from a negative to a positive value or vice versa. For the correction of simple closed areas, use Select by Attribute to select all elements that have an *'MPArea'* of less than zero. Then go to *Filter > Flip Selected Lines*.

LABELING ISSUES

I am having trouble with the MAP Tagger tool? Where am I going wrong?
This can happen either when the layer or object to be labeled is not available for editing. Check to make sure that the desired layer is available for editing, the features in question are not locked, and you have a Text layer in your document to use to output the text to. In addition, if there is no fill to an area or polygon object the label tool (much like the Illustrator selection tool) can only find the paths defining the unfilled area. Therefore in such cases it cannot 'find' the unfilled area and thus cannot label the unfilled area.

PROJECTION ISSUES

How do I know what projection my files are in?
In MAPublisher 6, the importers will automatically determine the projection of the chosen files, if this information is included in the file header or is located in an associated file (e.g. *.prj). If MAPublisher returns a message of *<undetected>* for the Projection, you should first ask your data provider to provide you with this information. Also there are a couple of strong hints that may indicate that a file is in latitude/longitude (lat/long). Both ArcView and MapInfo tend to store files in lat/long for rapid reprojection. This is why most files derived from such sources are stored in lat/long. A good test to see if a file is in lat/long is to look at the Map Anchor values in the MAP View Editor or in the MAP Location Tool. Typical Lat/Long values will be X between -180 and 180 & Y between -90 and 90.

TABLE ISSUES

What causes Join a Table not to work?
When using the Join a Table filter you should first ensure that the linking columns have similar attribute structures (i.e. the join columns should be of matching type). If your join does not work when you are joining on character columns, you should check for trailing blanks in your character values/fields.

OTHER ISSUES

Where can I find version updates for MAPublisher?
Updaters will always be found in the Avenza FreeZone at *http://www.avenza.com/freezone*.

How accurate is MAPublisher georeferencing?
At this point in time we are restricted to 32 bit storage for numbers, which allows for 7 digits of precision. The 32 bit storage restriction is controlled by the graphics environment software and not the MAPublisher software. We have asked for this storage restriction to be increased to 64 bit without success. We can and do all our internal calculations in 64 bit for accuracy, but the results still must be stored as 32 bit. MAPublisher's values are roughly 4.3 billion times more precise than Illustrator's.
Illustrator is fundamentally an art program. The numbers it uses for its vertex data are more than sufficient to provide precision enough such that the human eye cannot tell the difference, even at its highest zoom level. Unfortunately, MAPublisher must translate its coordinates into Illustrator's when placing them on the artboard. We do this using mathematical calculations based upon the parameters you provide (e.g. map & page anchors, scale, etc.). When MAPublisher does this, it is, in a sense, compressing its more-precise numbers into Illustrator's less-precise numbers, and this is where the truncation may occur.
An easier way to visualize this is to think of a pad of grid paper. If this paper were the artboard, Illustrator would only be able to place points where two grid lines meet, but MAPublisher could put points anywhere on the page. However, since Illustrator is ultimately where the information is plotted, when a MAPublisher point is plotted on the page it would get 'rounded' to the nearest grid line intersection point.

I am receiving an "Error loading plug-ins" when I start Illustrator. What should I do?
Search for and delete any copies of a file named "Adobefnt05.lst." If that does not work, search for and delete any copies of a file whose name starts with *'Adobefnt'* and has a **.lst* extension. The Adobefnt *.lst files are cached descriptions of the font environment. They can be rebuilt when needed so it is safe to delete them.

Are there any sources for free GIS data?
There are a multitude of web sites which offer free GIS data in several different forms. Please see pages A1/22 to A1/24 of this user guide for a list of several free download sites.

Why do some art objects fail to display completely?
Sometimes drawing with Illustrator's shape creation tools results in the object not being displayed completely by Illustrator. The object's geometry is complete because if you set the View to outline *(View > Outline)* as opposed to *Preview* you can see that the object is there in its entirety (you can also zoom in and out). However, once you restore the zoom level to the original extents at which the object was created it will no longer appear as a complete shape. The solution to this is to disable the anti-aliasing option in the Illustrator preferences dialog.

What can cause attribute corruption?

The most likely cause of attribute corruption (other than the files being corrupted before you got them) is that you have put layers with differing attribute structures into a single layer. As a rule of thumb you should use one layer for each external file that you are importing.

What can I do when a filter does not appear to work?

- Make sure that you have highlighted the desired Layer in the Layers palette and that it is unlocked and visible.
- Make sure that what you have asked the filter to do makes sense.
- Check your available and assigned RAM (Mac users).
- Try closing Illustrator and deleting your Illustrator preferences file.

Why have I lost the attributes for my point layer?

Regarding the editing of Point Data, you must use either MAP Stylesheets, Assign Legend Info, or Auto Assign Legend Info to change symbology. As point data is linked dynamically to the symbols which exist in the Symbols palette, you cannot edit graphical properties manually. A possible reason, therefore, is that you have chosen *'Break Link to Symbol'* from the Symbols palette options, resulting in the loss of attributes for your point data.

GIS Backgrounder

WHAT IS GIS?

A ***Geographic Information System*** (GIS) captures, stores, checks, analyzes, and displays georeferenced data about the earth. A GIS uses a database management system (DBMS) to store and link data that relates to the same geographic area. This facilitates the following types of queries:

- what if…?
- what is it?
- where is it?
- what spatial patterns exist?
- what has changed since…?

FEATURES OF A GIS

ANALYTICAL TOOL

GIS systems are used by all levels of governments, academia and business for such diverse purposes as monitoring environmental changes, sales planning, census reporting, municipal zoning, land records, mineral resource management, and mapping telecommunications and cable television utilities. In short, a GIS serves many needs and can be thought of as an analytical tool since it can be used to determine spatial relationships between geographic areas. A GIS contains a database linking spatial data with geographic information and lets you associate information with map features and to create new relationships based on those associations.

AREAS

An area is a closed, bounded object, which encompasses a homogeneous area (e.g., a park).

ATTRIBUTES

Attributes store descriptive information and are stored as sets of characters (including numbers). Attributes are usually considered tabular data.

GEOGRAPHIC DATA

Since a GIS is a digital map database storing both spatial (graphic) and descriptive (tabular) information, the integration of this information provides an opportunity for analysis and communication. Data is stored using the Cartesian system (X,Y co-ordinates) as follows:

- points are stored as a single X,Y location
- lines are stored as a series of ordered X,Y co-ordinates
- areas are stored as a string of X,Y co-ordinates defining the lines that bound the area.

LABELS, SYMBOLS AND COLOUR

Map attributes can be represented by labels, symbols, and colour to make them easy to interpret (e.g. rivers may be represented with blue lines of varying widths depending upon their size).

LAYERS

Map features can be logically grouped into layers of related information. For example, a map could be layered by rivers, soils, mineral deposits, and municipality. This layering makes it easy to perform analysis that overlay geographic features and combine adjacent areas with similar characteristics.

LINES

A line represents the linear shape of a map element, which is too narrow to be an area (e.g., a contour line or road).

MAP FEATURES

A GIS stores two types of map information: spatial information (which describes the location and shape of geographic features) and descriptive information about those features. A GIS links these two types of data and maintains the spatial relationships between the map features. Features are portrayed on two-dimensional maps as points, lines, and areas. For example, a map may contain points representing location information (such as telephone poles), lines representing linear features (such as roads), and areas representing geographic features (such as lakes).

POINTS

Usually represented by a symbol or label, a point is a discrete location which is usually too small to be identified as an area or line (e.g., an oil wellhead or manhole).

SPATIAL RELATIONSHIPS

A map allows you to identify spatial relationships (e.g., a fire tower located inside a park) but it relies on you to derive this information from it.

TOPOLOGY

Topology is a mathematical process for determining spatial relationships. It does this by expressing different spatial relationships as lists of features (i.e. an area is defined by the boundary lines). The primary advantage of this type of data storage is that it is more efficient and permits faster processing of larger data sets.

Graphics Backgrounder

WHY IS THE GRAPHICS ENVIRONMENT GOOD FOR MAPPING?

Avenza supports the fact that performing map-related graphics tasks is best done in the right environment- a powerful graphics program like Adobe Illustrator. This environment offers practicality, freedom and easy maneuverability for fast, cost-efficient and professional graphic output results. The MAPublisher environment focuses on the map graphics first with the right GIS data management tools to facilitate the map production process in the easiest and most efficient way. This is in direct contrast to traditional GIS software that are designed and written, for the analysis of geographic data, with the graphic map production coming second, almost as an afterthought. This means that as powerful as most GIS's are for analysis, they were never designed for cartographic or publication quality mapping. Cartographers have long been doing their mapping within graphics environments because they provide tools such as Bezier curves and true CMYK colour separation for publication quality mapping.

FEATURES OF THE GRAPHICS ENVIRONMENT

ACCURATE COLOUR

Colours displayed on screen accurately reflect the colours as they will be printed.

PROPORTIONAL SYMBOLOGY

Symbology is accurately proportional to the map area you have "zoomed" into.

VIEWS

You can display your document on–screen in a variety of ways using the View menu commands. For example, you can see a preview of the illustration as you edit, you can view only the outlines of your artwork, or you can preview selected parts of your artwork while displaying the rest as outlines. You can also create and save custom views of your document, retaining a particular magnification level, layering, and other viewing features for later retrieval. You can even display multiple views of a document at several different magnification levels simultaneously.

UPDATE PORTIONS OF A LAYER OR LEGEND

MAPublisher gives you the ability to update portions of a layer or legend by selecting one or more individual map objects based on attribute or colour/pattern/symbol and then applying a new colour/pattern/symbol. There is no deleting and then re-adding of the relevant map elements or layers. In practical terms this means that if you added a roads layer/element to your map and then realized that one of your roads line symbols didn't look right, all you need to do is select for that class of road and change the symbol with the palettes. There is no need to delete, re-code and re-drape your roads. It is even easier if you use the MAPublisher legend filters, in which case you only need to modify the legend for your roads and then draw to update the roads as desired.

REDRAWING IS AUTOMATIC

Redrawing of the affected map objects is clean and automatic and impacts only the redrawn portion and possibly some immediately adjacent portions of the map. This eliminates the need to wait while the entire map is re-drawn or refreshed. This applies to text as well as to vector data.

BROAD SELECTION OF FONTS

A broad and flexible selection of text fonts, styles, sizes and enhancement features (e.g., haloing) is available.

PASTE IN FRONT OR BEHIND
When pasting map objects/elements, you have the option of deciding to paste the new object "in front" or "behind" the copied elements at the time of pasting.

POSTSCRIPT PATTERN FILLS
You can use PostScript pattern fills and complex vector strokes. You can sample colours from images and apply them precisely to vector data.

COMPLEX COLOUR TREATMENTS
Even with complex colours you can quickly and accurately create colour ramps with differing depths/intensity of 10%, 20%, etc. These can be set as individual colours on a palette or as a gradient across mapped features.

IMPROVED SYMBOLOGY
Improved symbology (e.g., road treatments and cartographic symbols) than is available in traditional GIS software.

SPEED DRAWING
You can easily turn on and off selected layers of a map to speed drawing. This can be done by turning off specified layers, and/or limiting the display of selected layers to simple vectors with all symbology removed. Not only will this speed the handling of the map, it lets you easily use underlying vectors for reference with no distraction or distortion caused by mapping symbology.

ACTUAL SIZE VIEWING
In addition to standard zooming and panning capabilities, you can view the details on a map at the actual size at which they will be plotted/printed.

RULERS, GUIDES AND ALIGNMENT TOOLS
Rulers with adjustable guides and multi-combination alignment tools are available for use in aligning map objects.

GROUPING AND UNGROUPING
There is grouping and ungrouping functionality. When items are grouped you still retain the option of separately accessing, querying and otherwise working with the individual components of a map group.

STORE RELATED OBJECTS
Individual but related map objects can be "stored" together by groups or by layers or both within the graphic file. This provides additional control and support in handling and organizing the map components.

TEXT PLACEMENT
The graphics environment offers a truly hands-on text placement environment and goes well beyond that of a GIS. For example text can be easily placed along any path or outside the map
extents and is fully editable.

Memory Considerations

RAM RECOMMENDATIONS

Occasional User: 256-512mb of RAM is recommended.
A graphics or GIS user who uses MAPublisher with medium sized data sets with up to 20 layers, minimal text labels, and some low-resolution or small coverage raster images.

Power User: 512mb-1GB of RAM is recommended.
A professional cartographer who uses MAPublisher daily and works with large urban data sets (including large transportation layers) with 20 or more layers, raster based air photographs, large numbers of text labels, complex fill patterns, etc.

RAM USAGE HINTS

Users often ask us why is so much RAM needed to operate MAPublisher. First of all, Adobe Illustrator requires a significant amount of RAM itself in order to run smoothly. Secondly, map data sets are often large which increases the need for RAM even further. Map data sets contain both vector and attribute data which must be stored in memory. Since we are adding a database to Illustrator this increases the file size, which increases the RAM requirements. MAPublisher builds a mini-GIS application inside Illustrator so that it can geo-code information and attach data to objects. This also has some overhead.

GIS users also often ask why so much more memory is needed with MAPublisher than is with GIS software. The graphics environment software of Adobe Illustrator loads the entire file into memory rather than just reading it from disk, thus more RAM memory is required.

When you are importing a large number of files into Illustrator using MAPublisher, you'll notice that the amount of available memory will decrease rapidly and your computer loses speed. This is due to the memory management. MAPublisher reserves a fairly large amount of memory for each import-action, which is not properly returned when the import is done. The solution is simple: save your file, close it and open it again. It's not even necessary to close Illustrator itself. By closing the file, the reserved memory is properly returned.

RAM SAVING TIPS

Since a percentage of the memory is taken for attribute storage, drop any redundant or otherwise unnecessary attribute fields from the map attributes table.

Many sources of street data include paths/vectors that are segmented based on street addressing information. You can use the MAPublisher Join Lines filter to join these into single linear features based on a selected attribute field. Reducing the number of objects (and data records) in the map file will free up memory.

Many GIS data files are large and when a series of such files is imported, you may find that the import filter starts to run more slowly. This is because scratch and memory allocations are being used up. The best solution is to periodically save your work, quit out of Adobe Illustrator and then restart. This will free up the available scratch memory.

The minimum number of undos can be reduced (since they ALL reside in memory).

Use polylined or pre-joined linear feature data sets where available.

In your GIS application strip out the attributes you won't be using for queries or labeling before importing the data into Illustrator.

Increase your RAM allocation to Adobe Illustrator (Mac only) and be sure that it is the only application open.

You can click on the status dropdown in Illustrator (bottom left hand corner) and select "Free memory" to see how much memory resource is free at any given time.

You can set a primary and secondary scratch disk under the Illustrator preferences option in order to draw additional storage from a partitioned or multi-drive environment.

Online Links

Since the Internet is always changing, refer to our web page (www.avenza.com) for the most recent list of relevant Internet sites or do a Google or Yahoo search. As of the writing of this manual all the following links were active and functional.

For Geographic Information System (GIS) users, the appeal of graphics is strong and the increasing ability to discover and share GIS across the Internet is fascinating. The Internet offers a large number of free-access GIS-related websites from which you can access map and information data sets.

For the general public, there's general information about countries, states, and places; simple maps of areas (e.g., GIF, PS format); lists and maps of Internet resources in an area.

For cartographers and geography researchers, there are cartographic/ GIS base map files (e.g., USGS Demos, DLGs, TIGER); thematic data of a geographic nature (e.g., census data); and complete GIS data sets (e.g., ArcInfo export files).

These lists are readily available, and there is a comprehensive list of free data sites accessible from the MAPublisher Internet home page at: *http://www.avenza.com/support.links.html*.

FREE MAP DATA

The following are just some of the many sites on the Internet that offer free download of GIS data. Data is available from these and other Internet sites in a wide variety of formats. Please consult the sections in this manual on file formats (pages 20 to 22 & A1/2 to A1/9) to ensure that you obtain usable data.

AUSLIG
Australian national mapping agency offering digital map data, satellite imagery and elevation data. Data obtained here can be used for commercial purposes with permission.
• *http://www.auslig.gov.au/mapping/index/*

CAST
The Center for Advanced Spatial Technologies (CAST), University of Arkansas. Planned free access on the ARKNet statewide network. Among its high–tech offerings, CAST maintains a catalog of Arkansas, U.S. national and global data - e.g., GIS data in areas of archaeology, agriculture and population are downloadable as GIF files across the Internet. Obtain a map of historical land coverage data. Obtain data sets including Environment, Prehistoric and Historic Climate Reconstruction, Historic Census, and Tabular databases.
• *http://www.cast.uark.edu/local/hunt/index.html*

DIRECTIONS MAGAZINE DATA CENTER
Directions magazine is an internet-centred publication that provides news, analysis, commentary product information and free map data.
• *http://www.directionsmag.com/datacenter*

EROS DATA CENTER
The Eros Data Center will be providing FTP access to a variety of USGS digital data sets.
• *http://edcwww.cr.usgs.gov*

FREEDATA.CA
This site is dedicated to the issue of access to government geospatial data across Canada. .
• *http://www.freedata.ca*

GEOCOMMUNITY & GIS DATA DEPOT
The GeoCommunity and GIS Data Depot are an excellent sources of free GIS data, geographic software (including data viewers, translators and compression utilities) and industry news. This site also has several GIS-related discussion forums. The data found on this site covers most areas of the world.
• *http://www.geocomm.com*

GEOCONNECTIONS/GEOCONNEXIONS
This site from Canada's Ministry of Natural Resources offers many links to GIS data and other informational resources.
• *http://www.cgdi.gc.ca*

GEOGRAPHY NETWORK
The Geography Network is an online resource for finding and sharing world-wide geographic content, including maps and data from many of the world's leading providers.
• *http://www.geographynetwork.com*

GEOGRATIS
Geogratis is a Natural Resources Canada site offering maps, satellite imagery and tabular data.
• *http://geogratis.cgdi.gc.ca*

GISUSER
GISuser.com was launched in February, 2004. Their goal is to provide the geospatial technology user with the latest news, resources, and tools affecting the GIS industry.
• *http://www.gisuser.com*

MAPCRUZIN
MAPCRUZIN has data resources for environmental and socio-demographic research.
• *http://www.mapcruzin.com*

NATIONAL ATLAS OF THE UNITED STATES
This site is a great source of a wide variety of data files for the United States.
• *http://www.nationalatlas.gov/atlasftp.html*

DOUG PRICE'S LIST OF FREE DIGITAL GIS DATA
This site based at the Tennessee Geographic Information Council and the University of Tennessee offers an extensive list of data download links from around the world.
• *http://www.lib.utk.edu/~tngic/price.html*

ROBERT E. KENNEDY LIBRARY @ CALIFORNIA POLYTECHNIC STATE UNIVERSITY
California Polytechnic State University has various links to US-based map inventories.
• *http://www.lib.calpoly.edu/research/all_databases/gis/gis5.html*

UNITED STATES GEOLOGICAL SURVEY
Department of the Interior – USGS home page. This is the primary source for Digital Line Graph (DLG) files. A must–have resource is the US Geological Survey Digital Format Standards manual published by the USGS.
• *http://www.usgs.gov* - USGS Home page.
• *http://nsdi.usgs.gov* - Digital products.
• *http://www.usgs.gov/pubprod/index.html* - Products and Publications Listings.
• *http://greenwood.cr.usgs.gov* - The USGS Greenwood map server.

UNITED STATES FISH AND WILDLIFE SERVICE
The FWS carries a variety of map data in the USGS DLG format.
• *http://www.fws.gov*

OTHER VALUABLE MAPPING LINKS

The following are some additional places on the Internet where you can find news, reviews, tips and general GIS, cartographic and geographic information.

GIS CAFE
• *http://www.giscafe.com*

GIS DICTIONARY
• *http://www.geo.ed.ac.uk/agidict/welcome.html*

GIS LOUNGE
• *http://www.gislounge.com*

GIS@DEVELOPMENT
• *http://www.gisdevelopment.net*

UNIVERSITY OF CALIFORNIA, BERKELEY
• *http://sunsite.berkeley.edu/GIS*

UNIVERSITY OF EDINBURGH
• *http://www.geo.ed.ac.uk/home/gishome.html*

UNIVERSITY OF FLORIDA - GEOPLAN CENTER
• *http://www.geoplan.ufl.edu*

US CENSUS BUREAU
• *http://www.census.gov/geo/www/faq-index.html*

Technical Support Options

In this section you will find some tips and hints for performing additional MAPublisher-related tasks as well as a detailed listing of your technical support options.

TECHNICAL SUPPORT

Please consult the FAQs on pages A1/10 to A1/15, the additional how-to's on the following pages as well as the following online options before contacting Avenza technical support as your situation may be easily addressed by one of the answers contained therein.

MAPUBLISHER ONLINE KNOWLEDGE BASE

The MAPublisher Online Knowledge Base is a searchable online archive that offers a variety of MAPublisher information including newsgroup items, specific solutions and other contributions from Avenza, MAPublisher resellers and other MAPublisher users. The MAPublisher Online Knowledge Base is located at *http://www.avenza.com/support.kb.html*.

INTERNET MAILING LISTS

There are two very popular Internet mailing lists that are populated by experienced MAPublisher users worldwide and offer an open forum for discussing problems, solutions, tips and other general issues relating to MAPublisher and cartography. These lists are also monitored by Avenza technical support staff who often participate with a solution or useful discussion item.

- **mapublisher-l** - This is the main MAPublisher list. Subscribe by sending an email to *majordomo@avenza.com* with the statement *subscribe mapublisher-l <emailaddress>* in the body of the message. substitute your actual email address for *<emailaddress>*.
- **map-mac** - This is a very popular mapping list to which many MAPublisher users belong. It is not limited to mac-related discussions. Subscribe by sending an email to *majordomo@avenza.com* with the statement *subscribe map-mac <emailaddress>* in the body of the message. Substitute your actual email address for *<emailaddress>*

ONLINE FAQS

There is an ever-growing list of Frequently Asked Questions and answers on the Avenza website at *http://www.avenza.com/freezone/freezone.faq.html* which provides an additional source of tips, tricks and general MAPublisher information.

CONTACTING AVENZA TECHNICAL SUPPORT

Avenza offers a number of methods for direct communication with our qualified and experienced technical experts. Please have your MAPublisher registration details handy to get prompt attention and include it in any email correspondence. Support issues are handled on a first come, first-served basis. Avenza does not guarantee a response within any specified time. For priority support consider joining the MAPublisher Maintenance Program (see page A1/26).

- **email:** *support@avenza.com*
- **online form:** *http://www.avenza.com/support.form.html*
- **phone:** +1.416.487.6442 (Free for MAPublisher Maintenance Program subscribers. Others US$49 per incident.)

MAPUBLISHER MAINTENANCE PROGRAM (MMP)

The MAPublisher Maintenance Program is a subscription-based service plan that guarantees its members:

- unlimited priority technical support - guaranteed same business day (9-4 EST) or next business day response
- MMP only telephone support (+1-416-487-6442)
- free MAPublisher updates
- free MAPublisher version upgrades
- additional discounts and offers available to MMP members only

Your MAPublisher 6 purchase includes a one-year membership in the MAPublisher Maintenance Program so you are well on the way to worry-free use of MAPublisher and will be able to enjoy all the benefits of the MMP immediately. All MAPublisher Maintenance Program subscriptions begin on the date of registration of the license file and run for 1 calendar year.

Your email address has been automatically entered in the *maintenance-l* online email list for MMP subscribers so that you are assured of receiving all the latest MMP news and access to all the update and upgrade files. If you purchased your MAPublisher 6 license from a reseller or are the end user but not the person who purchased the software, please contact us at *sales@avenza.com* to ensure that we receive your email address and add you to the MMP notification group.

RENEWAL

Approximately 8 weeks prior to the expiration of your annual MMP subscription you will be notified regarding renewal options. You will be contacted a minimum of 5 times prior to expiration in order to ensure that you have ample opportunity to renew or not at your discretion. You will have the option of renewing your MMP for an additional year at the then prevailing price or canceling without penalty. Of course, if you cancel or let your MMP lapse you will no longer be entitled to the benefits of the program as outlined above and will thus have to purchase future upgrades at the upgrade price.

Note: There is a grace period of 30 days from the time of the MMP expiry during which you may still renew without penalty. All post-expiration renewals will be backdated to the actual expiry date.

LAPSED SUBSCRIPTIONS

Failure to renew your MMP within 30 days from the expiry date will result in a lapsed MMP subscription. Lapsed subscriptions may not be renewed and the licensee will be required to purchase support and upgrades accordingly.

Please direct all MMP questions and purchase inquiries to *info@avenza.com*.

WISHLIST

As either a new or experienced MAPublisher user we value your opinions on how we can improve our product. Please let us know what functions you would like to see incorporated into future upgrades of MAPublisher.

- *email us at wishlist@avenza.com*, or
- fill out the form at *http://www.avenza.com/products.wishlist.html*

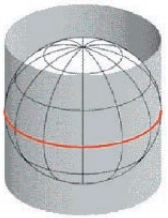
All About Projections

PROJECTIONS OVERVIEW

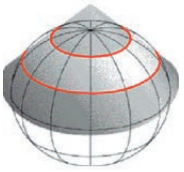
Map Projections are attempts to show the surface of the earth, or parts of it, on a flat surface. Some distortions of conformality, distance, direction, scale, and area always result from this process. Certain projections minimize distortions in some of these aspects at the expense of maximizing errors in others, whereas others only moderately distort all of these properties.

- **Conformality**: The scale at any point on the map is the same in all directions. Meridians (lines of longitude) and parallels (lines of latitude) intersect at right angles. Projections with these properties are ***Conformal.***
- **Distance**: A map has an ***Equidistant*** projection when it portrays equal distances from the centre of the projection to any other place on the map.
- **Direction**: A map preserves direction when azimuths (angles from a point on a line to another point) are portrayed correctly in all directions. Projections with these properties are ***Azimuthal***.
- **Scale**: The relationship between a distance portrayed on a map and the same distance on the Earth.
- **Area**: When a map portrays areas over the entire map so that all mapped areas have the same proportional relationship to the areas of the world they represent, the projection used is an ***Equal Area*** projection.

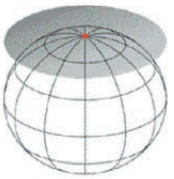
PROJECTION CATEGORIES



Cylindrical Projection: The result of projecting a spherical surface onto a cylinder. In a typical cylindrical projection, one imagines the paper to be wrapped as a cylinder around the globe, tangent to it along the equator. Light comes from a point source at the centre of the globe or, in some cases, from a filament running from pole to pole along the globe's axis. In the former case the poles clearly cannot be shown on the map, as they would be projected along the axis of the cylinder out to infinity. In the latter case the poles become lines forming the top and bottom edges of the map. The Mercator projection, long popular but now less so, is a cylindrical projection of the latter type that can be constructed only mathematically. In all cylindrical projections the meridians of longitude, which on the globe converge at the poles, are parallel to one another; in the Mercator projection the parallels of latitude, which on the globe are equal distances apart, are drawn with increasing separation as their distance from the equator increases in order to preserve shapes. However, the price paid for preserving shapes is that areas are exaggerated with increasing distance from the equator. The effect is most pronounced near the poles; e.g., Greenland is shown with enormously exaggerated size, although its shape in small sections is preserved. The poles themselves cannot be shown on the Mercator projection.



Conic Projection: The result of projecting a spherical surface onto a cone. In a conic projection a paper cone is placed on a globe like a hat, tangent to it at some parallel, and a point source of light at the centre of the globe projects the surface features onto the cone. The cone is then cut along a convenient meridian and unfolded into a flat surface in the shape of a circle with a sector missing. All parallels are arcs of circles with a pole (the apex of the original cone) as their common centre, and meridians appear as straight lines converging toward this same point. Some conic projections are conformal (shape preserving); some are equal-area (size preserving). A polyconic projection uses various cones tangent to the globe at different parallels. Parallels on the map are arcs of circles but are not concentric.



Azimuthal Projection: The result of projecting a spherical surface onto a plane. In an azimuthal projection a flat sheet of paper is tangent to the globe at one point. The point light source may be located at the globe's centre (gnomonic projection), on the globe's surface directly opposite the tangent point (stereographic projection), or at some other point along the line defined by the tangent point and the center of the globe, e.g., at a point infinitely distant (orthographic projection). In all azimuthal projections, the tangent point is the central point of a circular map; all great circles passing through the central point are straight lines, and all directions from the central point are accurate. If the central point is a pole, then the meridians (great circles) radiate from that point and parallels are shown as concentric circles. The gnomonic projection has the useful property that all great circles (not just those that pass through the central point) appear as straight lines; conversely, all straight lines drawn on it are great circles. A navigator taking the shortest route between two points (always part of a great circle) can plot his course on a gnomonic projection by simply drawing a straight line between the two points.

Miscellaneous Projections: Projections that do not fall into the above categories, such as unprojected maps, and rectangular latitude and longitude grids. Also this classification can be applied to modified projections; being altered versions of other projections. Pseudo projections have some of the characteristics of another class of projection. For example the Sinusoidal is called a pseudocylindrical projection because all lines of latitude are straight and parallel, and all meridians are equally spaced. However it is not a truly cylindrical projection because all meridians except the central meridian are curved.

PROJECTION EXAMPLES

CYLINDRICAL PROJECTIONS

- **Peters**: This projection is a cylindrical equal-area projection that de-emphasizes area exaggerations in high latitudes by shifting the standard parallels to 45 or 47 degrees.
- **Mercator**: Has straight meridians and parallels that intersect at right angles. Scale is true at the equator or at two standard parallels equidistant from the equator. The projection is often used for marine navigation because all straight lines on the map are lines of constant azimuth.
- **Miller Cylindrical**: Has straight meridians and parallels that meet at right angles, but straight lines are not of constant azimuth. Shapes and areas are distorted. Directions are true only along the equator. The projection avoids the scale exaggerations of the Mercator map.
- **Oblique Mercator**: These projections are used to portray regions along great circles. Distances are true along a great circle defined by the tangent line formed by the sphere and the oblique cylinder, elsewhere distance, shape, and areas are distorted. Once used to map Landsat images, this projection is used for areas that are long, thin zones at a diagonal with respect to north, such as Alaska State Plane Zone 5001.
- **Transverse Mercator**: These projections result from projecting the sphere onto a cylinder tangent to a central meridian. Transverse Mercator maps are often used to portray areas with larger north-south than east-west extent. Distortion of scale, distance, direction and area increase away from the central meridian.
- **British National Grid**: This is one of many national grid systems are based on the Transverse Mercator projection, and is administered by the British Ordnance Survey. The true origin of the system is at 49 degrees north latitude and 2 degrees west longitude. The false origin is 400 km west and 100 km north. Scale at the central meridian is 0.9996. The first BNG designator defines a 500 km square. The second designator defines a 100 km square. The remaining numeric characters define 10 km, 1 km, 100 m, 10 m, or 1 m eastings and northings.

- **Universal Transverse Mercator (UTM)**: Used to define horizontal, positions world-wide by dividing the surface of the Earth into 6 degree zones, each mapped by the Transverse Mercator projection with a central meridian in the center of the zone. UTM zone numbers designate 6 degree longitudinal strips extending from 80 degrees South latitude to 84 degrees North latitude. UTM zone characters designate 8 degree zones extending north and south from the equator.. See the UTM Zone Map on page A1/35.
- **Behrmann Cylindrical Equal-Area**: Cylindrical Equal-Area projections have straight meridians and parallels, the meridians are equally spaced, the parallels unequally spaced. There are normal, transverse, and oblique cylindrical equal-area projections. Scale is true along the central line (the equator for normal, the central meridian for transverse, and a selected line for oblique) and along two lines equidistant from the central line. Shape and scale distortions increase near points 90 degrees from the central line. The Behrmann projection uses 30:00 North as the parallel of no distortion.

CONIC PROJECTIONS

- **Albers Equal Area Conic**: A conic projection that distorts scale and distance except along standard parallels. Areas are proportional and directions are true in limited areas. Used in the United States and other large countries with a larger east-west than north-south extent.
- **Equidistant Conic**: Direction, area, and shape are distorted away from standard parallels. Used for portrayals of areas near to, but on one side of, the equator.
- **Lambert Conformal Conic**: Area, and shape are distorted away from standard parallels. Directions are true in limited areas. Used for maps of North America.
- **Polyconic**: The polyconic projection was used for most of the earlier USGS topographic quadrangles. The projection is based on an infinite number of cones tangent to an infinite number of parallels. The central meridian is straight. Other meridians are complex curves. The parallels are non-concentric circles. Scale is true along each parallel and along the central meridian.

AZIMUTHAL PROJECTIONS

- **Azimuthal Equidistant**: These projections are sometimes used to show air-route distances. Distances measured from the centre are true. Distortion of other properties increases away from the centre point.
- **Lambert Azimuthal Equal Area**: Is sometimes used to map large ocean areas. The central meridian is a straight line, others are curved. A straight line drawn through the centre point is on a great circle.
- **Orthographic**: Are used for perspective views of hemispheres. Area and shape are distorted. Distances are true along the equator and other parallels.
- **Stereographic**: Are used for navigation in polar regions. Directions are true from the centre point and scale increases away from the centre point as does distortion in area and shape.

MISCELLANEOUS PROJECTIONS

- **Unprojected Maps**: Include those that are formed by considering longitude and latitude as a simple rectangular coordinate system. Scale, distance, area, and shape are all distorted with the distortion increasing toward the poles.
- **Mollweide**: Used for world maps, is pseudocylindrical and equal-area. The central meridian is straight. The 90th meridians are circular arcs. Parallels are straight, but unequally spaced. Scale is true only along the standard parallels of 40:44 N and 40:44 S.

- **Eckert IV Equal Area**: Used for world maps, is a pseudocylindrical and equal-area. The central meridian is straight, the 180th meridians are semi-circles, whereas other meridians are elliptical. Scale is true along the parallel at 40:30 North and South.
- **Eckert VI Equal Area**: Is also used for maps of the world, and is pseudocylindrical and equal area. The central meridian and all parallels are at right angles, all other meridians are sinusoidal curves. Shape distortion increases at the poles. Scale is correct at standard parallels of 49:16 North and South.
- **Robinson**: Is based on tables of coordinates, not mathematical formulas. The projection distorts shape, area, scale, and distance in an attempt to balance the errors of projection properties.
- **Sinusoidal Equal Area**: Maps in this projection have straight parallels at right angles to a central meridian. Other meridians are sinusoidal curves. Scale is true only on the central meridian and the parallels. Often used in countries with a larger north-south than east-west extent.

DATUMS AND ELLIPSOIDS OVERVIEW

An ellipsoid is a mathematical figure generated by the revolution of an ellipse about one of its axes. The earth is not a sphere but an ellipsoid distorted by rotation about its axis, with the globe bulging at the equator and flattened at the poles. The actual amount of the flattening is approximately 21.5 km difference between the polar and equatorial radii. Ellipsoidal earth models are required for accurate range and bearing calculations over long distances. For example GPS navigation receivers use ellipsoidal earth models to compute position and waypoint information. Ellipsoidal models define an ellipsoid with an equatorial radius and a polar radius. The best of these models can represent the shape of the earth over the smoothed, averaged sea-surface to within about 100 metres.

Reference Ellipsoids are usually defined by semi-major (equatorial radius) and flattening (the relationship between equatorial and polar radii). Other reference ellipsoid parameters such as semi-minor (polar radius) and eccentricity can be computed form these terms.

A datum is a mathematical model that describes the shape of the ellipsoid, and orientation of coordinate systems used to map the earth. A datum is a smoothed mathematical surface of the earth's mean, sea level surface. Different nations and agencies use different datums as the basis for coordinate systems in GIS.

Modern datums range from flat-earth models used for plane surveying to complex models used for international applications which completely describe the size, shape, orientation, gravity field, and angular velocity of the earth.

DATUM EXAMPLES

- **NAD27**: For many years the North American Datum of 1927 was the standard in the United States. NAD27 was based on the Clarke Ellipsoid of 1866, which was developed from ground survey in Europe and North America in the 19th Century. The centre point for NAD27 is Meades Ranch in Kansas, USA.
- **NAD83**: During the 1970's and 1980's satellites were able to measure the ellipsoid flattening more accurately (the World Geodetic System ellipsoid of 1984 or WGS84) and a new datum was developed from these measurements called the North American Datum of 1983. The Global Positioning System is based on WGS84. The centre point for NAD83 is the centre of the earth's mass and uses the GRS80 spheroid which factors in the earth's equatorial bulge.

MAPUBLISHER 6 PROJECTIONS

MAPublisher 6 contains choices from over 4500 supported coordinate systems, based upon a wide variety of projections, ellipsoids and datums. Coordinate systems are listed in the following categories inside the MAP View Editor and Source Projection dialogs. Note that some coordinate systems may exist in a number of categories.

-ALL PROJECTIONS-
(Lists all the projections in the database)

-CUSTOM-
(Lists projections added to the database via import)

-RECENTLY USED-
(The last 20 projections used)

-SEARCH _____-
(Lists the most recent results of a 'Search Projection')

BY CLASS ...
- ...Azimuthal
- ...Conic
- ...Cylindrical
- ...Polyconic
- ...Pseudoconic
- ...Pseudocylindrical

BY GEOGRAPHICAL AREA ...
- ...Africa
- ...Asia
- ...Australia & NZ
- ...Canada
- ...Common Global Projections
- ...Common Regional Projections
- ...EPSG
- ...Europe
- ...Pacific
- ...US (others)

BY PROPERTY ...
- ...Compromise
- ...Conformal
- ...Equal Area
- ...Equidistant
- ...Latitude/Longitude
- ...Perspective

BY SCOPE
- ...Continent
- ...Hemisphere
- ...Region
- ...World

BY USE ...
- ...Geological
- ...Navigation
- ...Presentation
- ...Thematic
- ...Topographic
- ...USGS-suitable

STATE PLANES ...
- ...State Planes (HPGN)
- ...State Planes (HPGN, FT)
- ...State Planes (HPGN, IFT)
- ...State Planes (NAD27)
- ...State Planes (NAD83)
- ...State Planes (NAD83, FT)
- ...State Planes (NAD83, IFT)

UTM ...
- ...UTM (ERP50-W)
- ...UTM (HPGN)
- ...UTM (HPGN,FT)
- ...UTM (HPGN,IFT)
- ...UTM (INTNL)
- ...UTM (NAD27)
- ...UTM (NAD27,FT)
- ...UTM (NAD27,IFT)
- ...UTM (NAD83)
- ...UTM (NAD83,FT)
- ...UTM (NAD83,IFT)

Abbreviations:

ERP50-W:	*European Datum, 1950, West*
EPSG:	*European Petroleum Survey Group*
FT:	*in Feet*
HPGN:	*High Precision Geodetic Network*
IFT:	*in International Feet*
INTNL:	*International*
NAD27:	*North American Datum, 1927*
NAD83:	*North American Datum, 1983*
UTM:	*Universal Transverse Mercator*

Custom Projections

WORKING WITH CUSTOM COORDINATE SYSTEMS

A coordinate system within MAPublisher defines a mathematical model of the conversion between a specific location on the earth and a set of coordinates. Coordinate system definitions are specified by a set of parameters that define this mathematical model, including the earth model (ellipsoid or datum), the units used to measure the coordinates, the projection type, and any parameters specific to the projection type. Coordinate systems may be extracted from input feature data sources, may come predefined or may be defined by MAPublisher users. MAPublisher allows output coordinate systems that are different than the input ones to be specified and performs the required coordinate conversions when necessary.

MAPublisher 6 currently contains 4515 coordinate systems which are defined by a wide range of differing projections, datums and ellipsoids. Even though the current list of selections is comprehensive there may be instances where the end user may wish to add a brand new coordinate system to meet their particular needs, or perhaps to modify an existing definition to change the units for example. In either case the coordinate system database files that accompany MAPublisher may be edited directly by the end user so that new/modifed entries can be permanently stored within the defined list of coordinate system options.

Before commencing the process of creating a custom coordinate system, ensure that Adobe Illustrator is closed.

CREATING A CUSTOM COORDINATE SYSTEM

The following pages will deal with the process of defining a custom coordinate system. For advanced users, please refer to the Safe document entitled *'**FME_CS_Support.pdf**'* which is located in the *Documentation* folder of the MAPublisher 6 CD, or at the following link: *http://www.avenza.com/support.docs.html*
Certain procedures in this section may require additional instructions which can be found in this PDF.

Creating new or modifying existing coordinate systems is a two step process based on the editing the following files, *"**LocalCoordSysDefs.fme**"*and *"**Coordsys.db**"*. The contents of these files may be viewed and edited in a simple text editor such as Notepad or SimpleText. ***It is strongly recommended that you backup the original versions of these files prior to attempting to edit or modify them.***

DEFINING THE NEW COORDINATE SYSTEM

In order for a new coordinate system to be recognized within MAPublisher, the coordinate system must first be defined within the *"**LocalCoordSysDef.fme**"* file. This file is typically located in the following directory:

Windows: *C:\Program Files\Avenza\MAPublisher\FME\reproject*

Macintosh: *Library : Frameworks : FMEObjects.Framework : Resources : FMECore.bundle* : Contents : Resources : FME_HOME : Reproject*

** Note that if this folder is 'packed', you must 'Ctrl-click' the icon, and select 'Show Package Contents' from the dropdown.*

Open this file in a text editor. This file contains the names and descriptions of all predefined coordinate systems. Within it are a series of lines entitled: *"COORDINATE_SYSTEM_DEF", "DATUM_DEF", "ELLIPSOID_DEF",* and *"UNIT_DEF"* which define additional, site-specific coordinate systems.

As an example, the NAD83 based UTM Zone 12 coordinate system, defined in the *"LocalCoordSysDef.fme"* file, would be similar to the text below. The meanings of these values are described in *(brackets)*.

COORDINATE_SYSTEM_DEF UTM12N83 \	*(Coordinate System Name)*
DT_NAME NAD83 \	*(Datum Name)*
PROJ TM \	*(Projection Type)*
UNIT METER \	*(Unit Type)*
DESC_NM "NAD83 based on UTM Zone, meter" \	*(Descriptive Name)*
SOURCE "Source description" \	*(Source of the definition)*
PARM1 -111.0 \	*(Additional parameter unique for this coordinate system)*
SCL_RED 0.9996 \	*(Additional parameter unique for this coordinate system)*
ORG_LAT 0.0 \	*(Additional parameter unique for this coordinate system)*
X_OFF 500000.0 \	*(Additional parameter unique for this coordinate system)*
Y_OFF 0.0 \	*(Additional parameter unique for this coordinate system)*
MAP_SCL 1.0	*(Additional parameter unique for this coordinate system)*

DEFINING COORDINATE SYSTEM VARIABLES

The following table provides an overview of the basic parameters required for defining a Local Coordinate System. Note that not all of the parameters shown above are required for all coordinate systems definitions. Please refer to pages 99-107 of the *'FME_CS_Support.pdf'* document for unique requirements of each projection type.

NAME	RANGE	DESCRIPTION	OPTIONAL?
<coordSysName>	Any string	The name of the coordinate system being defined may be used to identify the coordinate system of a reader or writer.	No
<unit name>	See supported Coordinate Units *(*page 84)*	The name of the units used to measure coordinates in the coordinate system.	No
<projType>	See supported Projection Types *(*page 85)*	The type of map projection used for this definition. Determines which additional parameters may need to be specified.	No
<parameter>	Dependent on the Projection Type selected	Each projection system makes use of a set of parameters.	No
<datumName>	See supported Datums *(*page 115)*	The datum to be used for the projection. Either a datum or an ellipsoid must be specified for each coordinate system.	Yes
<ellipName>	See supported Ellipsoids *(*page 136)*	The ellipsoid to be used for the projection Either a datum or an ellipsoid must be specified for each coordinate system.	Yes

**Refers to page number in the 'FME_CS_Support.pdf'*

NAME	RANGE	DESCRIPTION	OPTIONAL?
<quadrant>	-4..4	The quadrant of the Cartesian coordinate produced by the coordinate system. See Quadrant *(*page 140)*	Yes
<descript. name>	any string	A descriptive name of the definition.	Yes
<source>	any string	Person or agency supplying the definition.	Yes

**Refers to page number in the 'FME_CS_Support.pdf'*

REFERENCING THE NEW COORDINATE SYSTEM

Once the definitions are defined in the *"LocalCoordSysDef.fme"* they are then referenced by the *"**Coordsys.db**"* file. This file is typically located in the following directory:

Windows: *C:\Program Files\Avenza\MAPublisher\FME*

Macintosh: *Library : Frameworks : FMEObjects.Framework : Resources : FMECore.bundle* : Contents : Resources : FME_HOME*

** Note that if this folder is 'packed', you must Ctrl-click the icon, and select 'Show Package Contents' from the dropdown.*

The *"**Coordsys.db**"* file contains the names and descriptions of all predefined coordinate systems. This is where you need to reference the coordinate system defined in the *"LocalCoordSysDef.fme"* file. Special attention must be given to naming conventions and to ensuring that the definition name, coordinate system description, units, and datum variables all coincide with parameters specified in the associated coordinate system definition. If you do not adhere to these principles, conflicts will occur during the startup process.

As an example, the NAD83 based UTM Zone 12 coordinate system, defined in the *"Coordsys.db"* file, would be similar to the text below.

UTM12N83 | NAD83 based on UTM Zone, meter | WORLD | NAD83 | | TM | METER *[* CR]*

[CR] You must enter a carriage-return here*

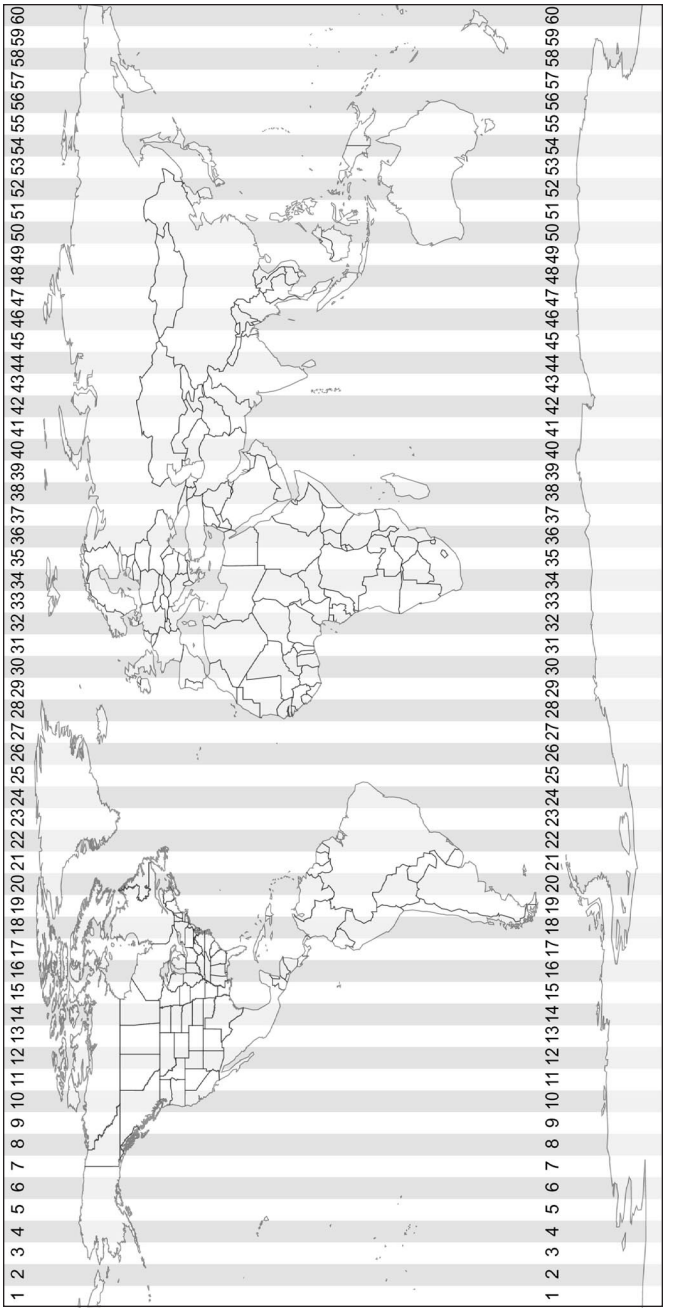
The meanings of these values, in the same order as the text above, are as follows.
<Coordinate System Name> | *<Description of Coord System>* | *<Group>* | *<Datum>* | *<Ellipsoid>* | *<Projection>* | *<Units>*

ACCESSING THE NEW COORDINATE SYSTEM

Once the definition has been successfully created and saved in the *"**LocalCoordSysDef.fme**"* and *"**Coordsys.db**"* files, restart Illustrator to access the new definition as a selectable choice in the coordinate systems dropdown list.

UTM Zone Map

UTM Zone	Central Meridian	Longitude Range
1	177W	180W-174W
2	171W	174W-168W
3	165W	168W-162W
4	159W	162W-156W
5	153W	156W-150W
6	147W	150W-144W
7	141W	144W-138W
8	135W	138W-132W
9	129W	132W-126W
10	123W	126W-120W
11	117W	120W-114W
12	111W	114W-108W
13	105W	108W-102W
14	99W	102W-96W
15	93W	96W-90W
16	87W	90W-84W
17	81W	84W-78W
18	75W	78W-72W
19	69W	72W-66W
20	63W	66W-60W
21	57W	60W-54W
22	51W	54W-48W
23	45W	48W-42W
24	39W	42W-36W
25	33W	36W-30W
26	27W	30W-24W
27	21W	24W-18W
28	15W	18W-12W
29	9W	12W-6W
30	3W	6W-0
31	3E	0-6E
32	9E	6E-12E
33	15E	12E-18E
34	21E	18E-24E
35	27E	24E-30E
36	33E	30E-36E
37	39E	36E-42E
38	45E	42E-48E
39	51E	48E-54E
40	57E	54E-60E
41	63E	60E-66E
42	69E	66E-72E
43	75E	72E-78E
44	81E	78E-84E
45	87E	84E-90E
46	93E	90E-96E
47	99E	96E-102E
48	105E	102E-108E
49	111E	108E-114E
50	117E	114E-120E
51	123E	120E-126E
52	129E	126E-132E
53	135E	132E-138E
54	141E	138E-144E
55	147E	144E-150E
56	153E	150E-156E
57	159E	156E-162E
58	165E	162E-168E
59	171E	168E-174E
60	177E	174E-180E



Tips and Hints

CREATING ASCII DELIMITED POINT FILES

There may be times when you wish to add a point or a series of points to your map but you do not have a GIS or ASCII file containing these points ready for import. Provided you have the real-world coordinates for the locations you wish to plot*, you can manually create a delimited ASCII file using a text editor (ex. Notepad, BBEdit, SimpleText, Ultra Edit etc.) or a spreadsheet program (ex. Excel, Lotus 123 etc.). This file can then be imported using either Simple or Advanced Import using the ASCII Point Data import format.

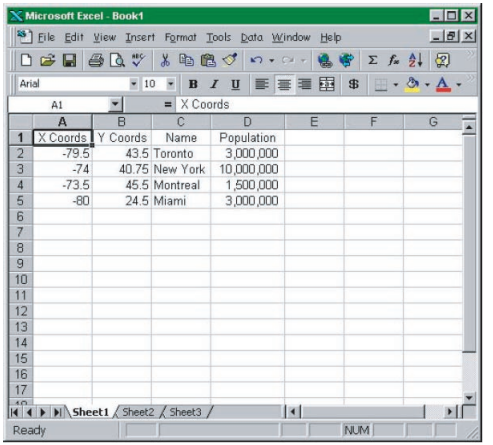
One column in the file must contain the X coordinates of the points and another must contain the Y coordinates. You can add as many additional columns as you wish containing additional information to be imported as attribute data.

If you are using a text editor, you can simply type in your data in the following format:

"Column 1 Header","Column 2 Header","Column 3 Header"...etc
"Column 1 Value 1","Column 2 Value 1","Column 3 Value 1"...etc
"Column 1 Value 2","Column 2 Value 2","Column 3 Value 2"...etc

Note that negative values for the X and Y coordinates denote west longitudes and south latitudes, respectively. Also make sure to enter a carriage return using the "enter" key on your keyboard after the last line of data otherwise the last line may be ignored by the MAPublisher Point Importer.

If you are using a spreadsheet application you can enter your point information as a table and save the file in a text format, preferably .csv or .txt, choosing either comma or tab delimiting. The spreadsheet application will format the text automatically. The screenshot below illustrates an example of such a table in Microsoft Excel prior to exporting as a .csv or .txt for import into Adobe Illustrator using MAPublisher 6.



	A	B	C	D
1	X Coords	Y Coords	Name	Population
2	-79.5	43.5	Toronto	3,000,000
3	-74	40.75	New York	10,000,000
4	-73.5	45.5	Montreal	1,500,000
5	-80	24.5	Miami	3,000,000

**Note the MAP Location Tool can be used to generate the X and Y coordinate values suitable for building ASCII Point Files.* *See page 37 for more information.*

JOINING SDTS TABLES

The following information should be used in conjunction with the MAPublisher Join a Table function.

When working with United States Geological Survey SDTS files it is necessary to join tables frequently in order to obtain the map attribute table you require to make the map you want. This is due to the fact that SDTS data is constructed such that the primary vector data is held separately from the various attribute tables that one might want to use for a particular mapping purpose. The attribute table that comes as part of the vector file usually contains a unique identifier (RCID) for each map element that is used to join it with the other data tables. For example, a particular vector file containing the geography of rivers would contain a data column called RCID. Various data tables containing information such as vegetation, fish counts or flow rates might be available each also with an RCID column. The desired tables are then joined to the initial map attribute table by RCID value using the techniques described in the previous pages.

To find the SDTS tables to join with the vector map file look for the files which have names that start with the same character string as the name of the vector file. MAPublisher 6 imports SDTS files that have the characters "CATD" at the end of the file name. A typical table to import and join with this file might be called HY01CATD.ddf.

Use the MAPublisher table importer with SDTS file type chosen to import these files. When you join layer and table, you do the join based on the column from the layer matched to the RCID column of the table. Several SDTS sample files can be found on your MAPublisher CD in the SDTS_samples folder. Note that the CATD catalog file found amongst the SDTS files explains what each table is.

ROTATING OBJECTS INDIVIDUALLY IN ADOBE ILLUSTRATOR

On some occasions you may wish to rotate selected objects about their own centres rather than as a group about a common origin. This can be accomplished using the native Adobe Illustrator ***Transform Each*** function. To use this function, first select the objects you wish to rotate. Then go to *Object* > *Transform* > *Transform Each*. In the "Rotate" box enter a desired rotation value and click OK. Each of the selected objects will be rotated individually about their own centres.

You may also use the Edit Column filter to individually rotate point symbols or text items based on a specified variable or by the contents of an attribute column. See pages 43-44 for guidelines on how to use this function.

BUILDING COLOUR-RAMP LEGENDS

You can enhance the look of your maps by using colour ramps, rather than random colours, for your legends.

1. Build a vertical set of filled legend elements on a *Legend Layer*.
2. Assign legend information to the elements using either *Assign Legend Info* or *Auto Assign Legend Info* (see pages 64-68)
2. Colour the first (top) and last (bottom) elements with the two extreme end colours for the ramp.
3. Marquee select the complete set of legend elements.
4. Select *Filter* > *Colors* > *Blend Vertically* and the legend elements will be blended between the two end colours.
5. You can then select *Filter* > *MAP Legend* > *Draw Legend Layer* to update your map.

GEOREFERENCING AN ADOBE ILLUSTRATOR FILE

If you are using an existing Illustrator file that was created without the use of MAPublisher and as such does not contain any geographic parameters or attribute data, the following steps will enable you to georeference your Illustrator file and ultimately create an attribute-rich and accurate scale and world grid structure for your map. Please note that the steps that follow refer to functions that are outlined in more detail in the body of this user guide. Please familiarize yourself with the main MAPublisher functions and in particular those under the MAP Views section (pages 45-53) before proceeding.

Before beginning to georeference an Adobe Illustrator file you must be in possession of the following information:

1. The real-world scale of your data
2. Details of the coordinate system the data is in (i.e. Projection, Datum etc)
3. The X-Y coordinates of one tie-in point in the coordinate system of your data

When you have this information please use the following guidelines in order to georeferencing data with MAPublisher in Adobe Illustrator.

1. Go to *View* > *Show Rulers*. Set the 0,0 point to the lower left hand corner of the page by double-clicking on the cross hairs in the upper right corner.
2. If you have a completed Illustrator vector file go to step 3. Otherwise, place and digitize your raster image.
3. Identify a registration or 'tie-in' point in your document. This should be a specific location in your document for which a real-world coordinate location is known or can be easily determined. Record the location of this point in real world coordinates on a piece of paper.
4. Locate the same tie-in point on the Illustrator document page and determine its X,Y coordinates in page units. Record this number as well using *Window* > *Info*.
5. You should now have the location of your tie-in point in both map and page units (e.g. –79.5, 43.5 in Lat/Long is located at 4cm, 2cm in the document).
6. Open the *MAP Views* palette, navigate to the *Options* section and select *New MAP View*.
7. Enter a name for the MAP View. Set the *Scale* to the proper scale of the map (i.e. a set distance in document units divided by a set distance in ground units).
8. Click the *Source Projection* button. Choose a projection which matches that of your vector data and click OK.
9. Click *OK* in the MAP View Editor to apply the information to the new MAP View.
10. In the *MAP Views* palette, navigate to the *Options* pullout, and then click on *Specify Anchors*.
11. Set the *Map Anchors* to the value of the tie-in location in map units using the values determined in step 3 (e.g. –79.5, 43.5).
12. Set the *Page Anchors* to the value of the tie-in location in Page Units using the values determined in step 4 (e.g. 4, 2). Then click OK.
13. If you have not previously done so, ensure that each layer in your Adobe Illustrator file contains only one feature type (*Point, Area, Line, Text, Legend*).
13. In the *MAP Views* palette drag each of the layers which contain your data in to your new MAP View, ensuring that you set the appropriate Feature Type in the *Undefined Layer* dialog.
14. Repeat steps 1-13 for any other coordinate systems which exist in your document (such as inset maps for example).
15. Your document is now a georeferenced MAPublisher file wherein each feature is also georeferenced and capable of accepting attributes using the MAP Attributes function (see pages 38-39). You can also use the MAPublisher *Export* function to create a GIS file from this newly georeferenced Illustrator map.

TIPS ON EXPORTING TO OTHER GIS SOFTWARE WITH MAPUBLISHER

These strategies do not focus on how to do the procedures, as these are discussed in the Export section (page 52), but more on what you need to know and understand for successful export results.

First and most importantly you need to understand that the MAPublisher export was designed to export MP imported or created data one layer and one feature at a time. Why is it important to know this? MAPublisher only recognizes objects that have been imported by or created with its filters. If a layer was not imported with MAPublisher or is not hosted by a designated MAP View, then MAPublisher will not allow you to export the layer.

If you have an entire layer that was not created by MAPublisher then:
1. Ensure that your layer contains only a single feature type (*Point, Area, Line* or *Text*).
2. In the *MAP Views* palette, check that you have a designated MAP View with a matching coordinate system. If you do not, create a new MAP View (see page 47).
3. Select the layer in the MAP Views palette.
4. Drag the layer to the MAP View containing the matching coordinate system to georeference the layer.

There are also a couple of additional considerations to be aware of when exporting:

Since the current exported vector formats are GIS formats that do not support the concept of Bezier curves you need to compensate for this. If you have Bezier curves in your Adobe Illustrator file they will not be recognized in the GIS software. In order for these features may be represented correctly you will need to add points to these lines in Illustrator first. Simply identify and select any objects that use Bezier curves and then select *Object* > *Path* > *Add Anchor Points*. Repeat this command until the line has a sufficient number of anchor points that the shape of your curves will not be lost on export.

Adobe Illustrator stores the origin of text that has been applied along paths differently from other text objects. We have found the following steps to be the most successful way to get such Text exported to GIS files:
1. Create a new Illustrator layer
2. Select any text that has been created along paths.
3. Drag this text to the new Illustrator layer
4. Select *Type* > *Create Outlines*. The text will be converted to vector objects.
5. In the *MAP Views* palette, drag this layer back into your MAP View, specifying Area as the feature type

You can now export your Text as Area objects. Since the text is no longer text, you can no longer modify the fonts. We recommend that you make a copy of the original text objects before you do this process. These hints on how to transfer Illustrator files are necessary because the graphics environment handles text and curves differently and they need some modification in order for the GIS software to represent these accurately.

IRREGULAR TEXT ALONG LINES AND HOW TO FIX IT

Sometimes when text is applied along lines the results are less than optimal, with text elements falling off the line. This happens because there are two or more nodes in one place. The following steps should help fix this in your document. The solution is to run the MAPublisher *Spline Lines* filter on the lines to quickly eliminate the redundant nodes before applying text. If there is a concern about modifying the source, you can run the *Join Lines* filter on the layer (with the label field as the join field) to make a second joined layer that can then can then be splined. The first layer is for unmodified linear feature symbolization and the second layer is used only for the text labeling. Remove the splined vectors after you apply the text, and before adjusting positioning of your text.

DOUGLAS-PEUCKER LINE SIMPLIFICATION

The Douglas-Peucker algorithm was primarily designed to reduce the number of points required to represent a vector line. A common problem in digital cartography and geographic information systems can occur when lines are generated automatically from a mathematical function, which records points at a fixed interval regardless if they are all lying along a straight line. A reduction of the number of points makes for a cleaner and more readable cartographic line. As well in cartographic work within Adobe Illustrator the removal of points along a path can significantly improve the speed of file redraws and reduce the overall file size.

The Douglas-Peucker Algorithm was created in Fortran 66 by David H. Douglas and Thomas K. Peucker at the University of Ottawa in 1970-71. It was extensively tested in 1972 and was publicly communicated in the following article: "Algorithms for the Reduction of the Number of Points Required to Represent a Digitized Line or Its Caricature", 'Canadian Cartographer', Vol. 10, No. 2, December 1973.

There are a number of online resources where more information may be found on the Douglas-Peucker algorithm including *http://citeseer.nj.nec.com/hershberger92speeding.html* and *http://www.cs.unc.edu/~mantler/safesimp/safeset/sld004.html*.

TIPS ON EXPORTING DATA TABLES

You can export any data tables that are linked to physical features in MAPublisher.

a) To export as a comma-delimited data table, export the desired features as MapInfo mid/mif format. The export file with the extension .mid will contain your attribute data in comma delimited form.
b) To export as a DBF data table, export the desired features as Arcview shape files format. The export file with the extension .dbf will contain your attribute data in standard DBF format.

BEZIER CURVES AND OTHER MAPUBLISHER OPERATIONS

Bezier curves are defined using four control points. Two of these are the end points of the curve, while the other two effectively define the gradient at the end points. These two points control the shape of the curve. The curve is actually a blend of the control points. This is a recurring theme of approximation curves; defining a curve as a blend of the values of several control points.

Most GIS formats do not usually support bezier curves used in graphics packages such as Adobe Illustrator. As such you will typically find that curved sections of GIS data will be composed of a series of small line segments rather than an actual curve. This is also how such features will first appear in Illustrator when imported with MAPublisher. The MAPublisher *Simplify Lines* filter can be used to convert this type of feature into a Bezier curve (see page 92).

If Bezier curves are exported from Illustrator using any of the MAPublisher Export filters they will be converted to link and node topology (i.e. the end points of the curve will simply be joined as straight lines). It is therefore necessary to create additional points to curves to retain their true shape. This can be done globally by using the Illustrator's *Add Anchor Points* function via *Object > Path > Add Anchor Points*.

This version of MAPublisher supports Bezier curve features during the following operations:

- Scale and Projection transformations via the MAP View Editor
- Area and length calculations

CREATING SYMBOLS FOR USE IN POINT STYLESHEETS

A MAPublisher Symbol Library and a National Parks Symbol Library are supplied in the Utilities folder on the MAPublisher 6 CD. You may also find that a search on the internet may be useful for finding additional libraries. Please refer to *Tutorial 7-iii: 'Creating a Point Stylesheet'* for information on using such libraries for use in MAP Stylesheets. If you are required to create new symbols, the steps below will help you to quickly create symbols manually in Adobe Illustrator.

1. Use Adobe Illustrator's tools for the manual creation of artwork that will comprise the new symbol. If you wish to use a character that are contained in a font library, select the text character instance and go to *Type* > *Create Outlines* to convert the text to vector art.
2. Open the Illustrator ***Symbols*** palette *(Window* > *Symbols*).
3. Select the artwork that will comprise the new symbol and drag it into the Illustrator *Symbols* palette. Double click the symbol in this palette to assign a name.
4. When *Edit MAP Stylesheet* is accessed for Point Stylesheets, this symbol will be available in the *Style* column.

CREATING A LEGEND TEMPLATE

You can create template files with legends to automate the production of a series of similar maps.

The procedure when using MAP Stylesheets is as follows:

1. Create a prototype map using the MAPublisher Stylesheet function to create the desired "look".
2. Make a copy of your prototype map file. Delete all the layers from the file so that only the designated Stylesheets exist
3. Save it to a new template file.
4. Use this template file as a base for future maps as follows:

a) Make a copy of the template file.
b) Import all map layers into the template file and do any needed processing.
c) In the MAP Stylesheets palette, drag your MAP Layers into the desired MAP Stylesheets.
d) Your new layers will be symbolized by the previously defined Stylesheet.

The procedure when using Assign Legend Info or Auto Assign Legend Info is as follows:

1. Create a prototype map using the MAPublisher Legend filters to create the desired "look".
2. Make a copy of your prototype map file. Delete all the map objects except the Legend Layer elements.
3. Save it to a new template file.
4. Use this template file as a base for future maps as follows:

a) Make a copy of the template file.
b) Import all map layers into the template file and do any needed processing.
c) Drag the Legend Layer into the MAP View that contains the features you wish to apply the legend to.
d) With the appropriate legend elements selected, select Filter > MAP Legends > Draw Legend Layer.
e) Your new layers will be symbolized by the previously defined legend elements.

USGS Data Backgrounder

The U.S. Geological Survey offers many different types of map products including the following:

- Antarctic
- Geologic
- Hydrologic
- Land Use
- National Atlas
- Photo-image
- Planets and Moons
- Satellite Image
- Special Maps
- Topographic
- Topographic-Bathymetric

ANTARCTIC

Antarctic maps are available in four different scales:

1:250,000
A topographic reconnaissance and a geologic reconnaissance series at this scale has contour intervals of 200 meters and show Bathymetric information for coastal areas. The topographic series is the primary map source for the planning, logistic support, and multi-disciplinary investigations of the U.S. Antarctic Research Program.

1:500,000
Three series of maps - topographic reconnaissance shaded-relief, satellite image, and sketch - are published at this scale. The satellite imagery was recorded by NASA's Landsat.

1:1,000,000
Topographic maps and Landsat maps are published at this scale. Topographic maps in the International Map of the World (IMW) format have contours at 100, 300, or 500 meters.

1:2,188,800
A reconnaissance sketch and topographic map of the Ross Ice Shelf at this scale was made in support of the Ross Ice Shelf Geo-physical and Glaciological Program.

GEOLOGIC

The USGS makes many kinds of geologic maps as a part of a continuing program to fulfill one of its missions: to examine the geological structure, mineral resources, and products of the national domain. USGS maps that portray the geology of regions or local areas are available for over 50% of the United States.

HYDROLOGIC

Hydrologic Investigations Atlases (HA Series) are either black-and-white or multicoloured maps showing a wide range of water-resources information, such as depth to ground water, floods, irrigated acreage, producing aquifers, availability of water on Indian lands, surface-water discharge to the oceans, chemical or mineral content of water, surface impoundments, and water temperature. Flood-prone area maps (scale of 1:24,000) are available by quadrangle name, from the Water Resources Division District Office in the State of interest.

LAND USE

Land use refers to human uses of the land (for example, for housing and industry). Land cover describes the vegetation, water, natural surfaces, and construction on the land surface. Standard base map features include boundaries, cities and towns, railroads, roads and highways, rivers and lakes - but no contours. Land use and land cover maps are available for most of the United States. Land use and land cover data are shown on USGS base maps at a scale of 1:100,000 for a few maps in Western States or at 1:250,000 (most maps).

NATIONAL ATLAS

The National Atlas of the United States of America (1970) contains 765 maps and charts on 335 pages. This Atlas is now out of print, but can be found in many libraries. Separate sheets of selected reference maps and thematic maps from the Atlas are available from the USGS. Some of the sheets have been updated.

PHOTO-IMAGES

Orthophoto Maps are multicoloured, distortion-free, photographic image maps. They show subtle topographic detail in areas of very low relief, such as marshlands and coastal zones. They are produced in standard 7.5 minute quadrangle format from aerial photographs. Scale of 1:24,000 or 1:25,000.

Orthophotos Quads are multicoloured, distortion-free, photographic image maps. They have no contours, minimal cartographic treatment, and only a few names and symbols. Orthophoto quads are available for selected areas along the east coast of the United States.

Border Maps are natural colour photoimage maps. They are available for the USA-Mexico border and the USA-Canada border.

PLANETS AND MOONS

In 1960, the USGS established an astro-geology program on behalf of NASA to support lunar and planetary exploration. A prime activity of the program is the systematic mapping of the stratigraphy and structure of the Moon, Mars, Venus, Mercury, and the moons of the outer planets. Many USGS maps of the Moon, Mars, Venus, Mercury, and the moons of Jupiter and Saturn are now available for purchase by the public. The maps include geologic, topographic, photomosaic, and shaded-relief maps. The scales, projections and sheet sizes vary widely.

SATELLITE IMAGES

Satellite image maps are multicolour or black-and-white photograph-like maps made from data collected by Earth resources satellites. They are a diverse group of experimental maps printed in a standard edition and in a variety of scales and sizes. Many standard editions have topographic maps printed on the reverse side. Most image maps are printed to simulate colour-infrared photography by combining imagery that was scanned in red, green, and infrared wave lengths of light.

On colour-infrared imagery, healthy vegetation appears in shades of red. Unhealthy vegetation appears in shades of pink, blue, or white. Clear water appears dark blue or black. Sediment laden water takes on a light-blue tone. Most cultural features appear as a steely blue-gray. Satellite images are available for selected areas in about half of the States and such areas as Antarctica, the Bahamas, and Iceland.

SPECIAL MAPS

A wide variety of special maps are available for purchase from the USGS:

- Geologic Map of the United States
- Basement Rock Map of the United States - Exclusive of Alaska and Hawaii
- Coal Fields of the United States
- World Seismicity Map
- Generalized Tectonic Map of North America
- Surface Water and Related Land Resources Development in the United States and Puerto Rico

Many other special USGS maps are published from time to time. The USGS has also published several planimetric maps of the United States, North America, and the World. Most of these maps show political boundaries, major cities and capitals, and many rivers and lakes.

TOPOGRAPHIC

Most USGS topographic maps use brown contours to show the shape and elevation of the terrain. Elevations are usually shown in feet, but on some maps they are in meters. Contour intervals vary, depending mainly on the scale of the map and type of terrain. The maps show and name prominent natural and cultural (man-made) features.

7.5-Minute Maps
The best known USGS maps are those of the 7.5-minute, 1:24,000-scale quadrangle series. On such maps, 1 inch = 2,000 feet. The scale of these maps is used for areas where much detail must be shown.

15-Minute Maps
From 1910 to about 1950, maps showing an area within 15 minutes of latitude and longitude were the USGS standard for topographic coverage of the United States. These maps were at a scale of 1:62,500 (1 inch = about 1mile) and are still available. Features shown on these maps are similar to those on 7.5-minute maps, but some detail is omitted or generalized at the smaller scale.

U.S. 1:100,000-Scale Series
Much of the United States is covered by 30- by 60-minute quadrangle maps at a scale of 1:100,000. Most of these maps are derived from 1:24,000-scale maps, but they show distances and contour intervals in meters. Contours are at intervals of 5, 10, 20, or 50 meters depending on terrain relief.

County Map Series
A county map may consist of one or more sheets, depending on the size of the county. County maps are available in scales of 1:50,000 and 1:100,000.

U.S. 1:250,000 - Scale Series
Maps in the 1:250,000-scale (1 inch = about 4 miles) series are available for the entire United States. They were originated by the U.S. Army Map Service during the 1950s, but are now maintained by the USGS. This series serves as base maps for aeronautical charts and geologic maps, for geographic reference, and in planning regional land use, transportation, and utility systems.

State Map Series
The state maps in this series are usually published in three separate editions: base map, highway and contour map, and shaded-relief map. Most are at a scale of 1:500,000. The features shown are limited to areas within the State. No areas adjoining States are shown except for shorelines and other water areas that form State boundaries.

U.S. 1:1,000,000 - Scale Series
This series of topographic maps has been discontinued by the USGS and will not be reprinted when the existing stock is depleted. The ground area shown ranges from 73,734 to 122,066 square miles (123,000 to 204,000 square kilometers). The maps show principal cities and towns, railroads, and political boundaries in black, roads in red, water features in blue, topography in brown, contour lines and gradient tints.

National Park Map Series
Each of these topographic maps, some of them with shaded relief, feature a national park, national monument, or national historic site at a range of scales. The maps are much like the standard quadrangle maps at the same scale, but they highlight recreational features.

Shaded-relief Maps
USGS publishes shaded-relief editions of certain topographic maps to accentuate physiographic features of special interest, and for some state, Antarctic, and national park maps. These maps use shaded relief, as well as contour lines, to represent the shape of the terrain.

TOPOGRAPHIC-BATHYMETRIC

These USGS maps show in one format and one edition the data for a land-water area previously shown separately as a topographic map and a bathymetric map. On topographic-bathymetric maps, contour lines show elevations of the land areas above sea level, and isobaths (depth contours) show the form of the land below the water surface. Some bathymetric maps show magnetic and gravitational data in addition to water depths. Because coastal zones include both land and water, maps of such areas must include both topographic and bathymetric data. To produce these coastal maps, the National Ocean Service provides bathymetric data to be added to USGS topographic maps. The combined map serves the needs of oceanographers, marine geologists, land use planners, physical scientists, conservationists, and others having an interest in management of the coastal zone, the wetlands, and the offshore environment.

Appendix 2: Data List

The following is a list of the data included in the *Tutorial Data* folder on this CD. These files are used in the example exercises in the *Tutorials.pdf*.

avginc.csv	ASCII comma-delimited table of income statistics for downtown Toronto
azdeci.txt	ASCII comma-delimited file containing point data for part of Arizona
borneo.tfw	World file containing registration information for the borneo.tif image
borneo.tif	A relief image of the island of Borneo in Tiff format
burlroads.mif	A MapInfo file of a few of the major roads, highways and railways of Burlington, Canada
canada.shp	A Shapefile of the provinces of Canada in Latitude/Longitude
capeverde.e00	An ArcInfo Export file of the Cape Verde Islands
fcstreets.mif	A MapInfo file of major roads in Falls Church County, Virginia
fsatoronto.mif	A MapInfo file of the forward sortation areas (postal zones) of downtown Toronto
greenland.mif	A MapInfo file of Greenland
hypoint.e00	An ArcInfo Export file of Alberta, Canada containing elevation points and values
income.mif	A MapInfo file of downtown Toronto containing various income statistics
italy.mif	A Mapinfo file of the outline of Italy
sicily.tif	A relief image of the island of Sicily in Tiff format
southchinasea.shp	A Shapefile containing a map of the South China Sea and surrounding area.
toronto.ai	An Adobe Illustrator file of streets and postal areas in downtown Toronto
torontostreets.mif	A MapInfo file containing road data for downtown Toronto.
torontostreetsjoined.mif	A version of the torontostreets file containing lines joined by street name
ukpoly.shp	A Shapefile of the outline of the United Kingdom
ukrail.gen	An ArcInfo Generate file of railways in the United Kingdom
usa48.ai	An Adobe Illustrator file of the conterminous United States
usa.tab	A MapInfo Table file of the United States
world.mif	A MapInfo file containing a political map of the world with statistical information
worldeast.shp	A Shapefile containing the continents of Africa, Antarctica, Asia, Europe and Oceania
worldwest.shp	A Shapefile containing the continents of North America and South America

Appendix 3: Utilities List

The following utility programs and files are included on the MAPublisher 6 CD for your reference and convenience. They can all be found in the *Utilities* folder. Please ensure you consult the Readme files before using these tools.

MACINTOSH UTILITIES

Utilities > MAP Actions

MAP_Actions.aia	Custom action set for the quick loading of MAPublisher windows and palettes

Utilities > MAP Styles and Symbols

MAP_AreaStyles.ai	A custom library of 99 styles, used for Area Stylesheets.
MAP_LineStyles.ai	A custom library of 99 style, used for Line Stylesheets.
MAP_PointSymbols.ai	A custom library of 99 symbols, used for Point Stylesheets.
MIF_AreaStyles.ai	A library of MapInfo MIF/MID area styles 1-71, used for Area Stylesheets.
MIF_LineStyles.ai	A library of MapInfo MIF/MID line styles 1-77, used for Line Stylesheets.
DGN_LineStyles.ai	A library of Microstation DGN line styles 1-7, used for Line Stylesheets.
NP_PointSymbols.ai	The National Park font library converted to symbols, used for Point Stylesheets.
IAN Symbol Sampler.ai	Sample Symbol library for Point Stylesheets, created by the Integration and Application Network, University of Maryland Center for Environmental Science, USA.

WINDOWS UTILITIES

Utilities > MAP Actions

MAP_Actions.aia	Custom action set for the quick loading of MAPublisher windows and palettes

Utilities > MAP Styles and Symbols

MAP_AreaStyles.ai	A custom library of 99 styles, used for Area Stylesheets.
MAP_LineStyles.ai	A custom library of 99 style, used for Line Stylesheets.
MAP_PointSymbols.ai	A custom library of 99 symbols, used for Point Stylesheets.
MIF_AreaStyles.ai	A library of MapInfo MIF/MID area styles 1-71, used for Area Stylesheets.
MIF_LineStyles.ai	A library of MapInfo MIF/MID line styles 1-77, used for Line Stylesheets.
DGN_LineStyles.ai	A library of Microstation DGN line styles 1-7, used for Line Stylesheets.
NP_PointSymbols.ai	The National Park font library converted to symbols, used for Point Stylesheets.
IAN Symbol Sampler.ai	Sample Symbol library for Point Stylesheets, created by the Integration and Application Network, University of Maryland Center for Environmental Science, USA.

Utilities > Shapechecker

shapechk.exe	A utility for checking the validity of shapefiles.

Utilities > MapInfo scripts

BulkLayerExport	A script for MapInfo Professional for batch exporting of mid/mif files.

Appendix 4: Acknowledgements

Avenza Systems Inc. would like to acknowledge and thank the following companies and individuals for their contributions to MAPublisher 6 for Adobe Illustrator and for data and other files that may appear on the MAPublisher 6 for Adobe Illustrator CD. In addition to those mentioned below we wish to thank the many beta-testers who helped us design and test this product. Please note the maps used for the chapter intro pages are credited on the first page of this guide.

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Appendix 5: Glossary

If you have difficulty with some of the GIS terminology used, you can also access the following for more information:

http://srmwww.gov.bc.ca/gis/glosstxt.html
http://www.avenza.com/glossary.html

A

Accuracy
The closeness of results of observations, computations or estimates to the true values or the values accepted as being true. Accuracy relates to the exactness of the result, and is distinguished from precision, which relates to the exactness of the operation by which the result is obtained.

AGI
Association for Geographic Information.

Algorithm
A set of rules for solving a problem.

ASCII
American Standard Code for Information Interchange, a widely used industry standard code for exchanging alphanumeric codes in terms of bit-signatures.

ANSI
American National Standards Institute, an association formed by the American Government and industry to produce and disseminate widely used industrial standards.

Analog / Analogue
A continuously varying electronic signal. Also refers to traditional paper mapping products and aerial photographs.

Annotation
The explanatory or descriptive alphanumeric text or labels on a map (or artwork), such as street or place names.

Application
A set of computer programs designed for a specific task.

ArcInfo Export
File format with the extension .e00 for files exported from ArcInfo.

Area
A bounded continuous two-dimensional object, which may or may not include its boundary. Usually defined in terms of an external polygon or in terms of a set of grid cells. A fundamental unit of geographical information. See polygon.

Aspect
Individual azimuthal map projections are divided into three aspects: the polar aspect which is tangent at the pole, the equatorial aspect which is tangent at the Equator, and the oblique aspect which is tangent anywhere else. (The word 'aspect' has replaced the word 'case' in modern cartographic literature).

Attribute
Non-graphic alphanumeric textual information associated with a point, line, or area element in a GIS data set; tabular data associated with geographic features.

Azimuth
The angle measured in degrees between a base line radiating from a center point and another line radiating from the same point. Normally, the base line points North, and degrees are measured clockwise from the base line.

B

Bezier Curve
A Bezier curve consists of two anchor points connected by a curved segment, with at least one direction point and direction line attached to each anchor point.

Binary
A number system of base 2. Numbers are represented simply as a series of 0's or 1's in contrast to base 10 number systems that represent numbers using the characters 0-9. For example, the base 10 number 65535 translates to the base 2 number 1111111111111111. Binary numbers are the fundamental basis of computing.

Bitmap
A grid of small squares, cells or pixels stored in memory and used to generate an image.

Boolean
There are two types of values: true and false. True/false or yes/no usually represent these.

C

CAD(D)
Computer-Aided Drafting (Design).

Cadastre
A public register or survey that defines or re-establishes boundaries of public and/or private land for purposes of ownership and taxation.

Cartography
The organization and communication of geographically related information in either graphic or digital form. It can include all stages from data acquisition to presentation and use.

CAST
Centre for Advanced Spatial Technologies, University of Arkansas.

Cell
The basic element of spatial information in a raster image.

Clipping
A graphic process of cutting lines and symbols off the edge of a display area.

Colour Ramp
A graduated range of colours between two extreme colour selections.

Conformal
A map projection is conformal when at any point the scale is the same in every direction. Therefore, meridians and parallels intersect at right angles and the shapes of very small areas and angles with very short sides are preserved. The size of most areas, however, is distorted.

Contour
A line connecting points of equal elevation.

Curvature
The amount of curve in line as defined by a series of points.

D

Data model
An abstraction of the real world which incorporates only those properties, being relevant to the application at hand. The data model would normally define specific groups of entities, and their attributes and the relationships between these entities. A data model is independent of a computer system and its associated data structures.

Database
A collection of data organized according to a conceptual structure describing the characteristics of the data and the relationships among their corresponding entities.

Database management system (DBMS)
A set of computer programs for organizing the information in a database usually containing routines for data input, verification, storage, and retrieval.

DEM
Digital Elevation Model. DEM is a raster format used by the USGS to record elevation information. Unlike other raster file formats, DEM cells do not represent colour brightness values but rather the elevation of points on the earth's surface.

Demographics
Statistics of birth, death, population, etc.

Developable surface
A developable surface is a simple geometric form capable of being flattened without stretching. Many map projections can then be grouped by a particular developable surface: cylinder, cone, or plane.

DGN
Native file format of MicroStation from Bentley Systems Inc.

Digital
The ability to represent data in discrete units or digits.

Digital Line Graph
USGS standard output file format. These files can be in either Optional (.opt, .do) or SDTS (.ddf) form.

Douglas-Peucker Line Simplification Algorithm
A method of simplifying line data by removing unnecessary vertices.

Drag
To hold down the mouse button while you move the mouse cursor on the screen.

Drag and drop
The act of dragging a file with the mouse over another executable file to cause some action on the first file.

DTP
Desktop Publishing.

DWG
AutoCAD Drawing file.

DXF
AutoCAD Drawing Exchange Format.

E

Element
A fundamental geographical unit of information, such as a point, line, area, or pixel.

EPS
Encapsulated Post Script file format The EPS format is used to transfer PostScript language artwork between applications - also see PostScript.

Equal areas
A map projection is equal area if every part, as well as the whole, has the same area as the corresponding part on the Earth, at the same reduced scale. No flat map can be both equal area and conformal.

Equidistant
Equidistant maps show true distances only from the center of the projection or along a special set of lines. For example, an Azimuthal Equidistant map centered at Washington shows the correct distance between Washington and any other point on the projection. It shows the correct distance between Washington and San Diego and between Washington and Seattle. But, it does not show the correct distance between San Diego and Seattle. No flat map can be both equidistant and equal area.

F

FAQ
Frequently Asked Question.

Feature
A set of points, lines or polygons in a spatial database that represent a real-world entity. The terms feature and object are often used synonymously.

Feature code
A set of characters (alpha, alphanumeric or numeric) within the GIS, which uniquely identifies a feature class or group of features.

File
A collection of related information that can be accessed by an assigned name.

Filter
See Plug-in filters.

Folder
A storage area for files within the Macintosh OS, the equivalent of a DOS or UNIX directory.

Format
The way in which data is arranged for storage and for transmission between software and computers.

FTP
File Transfer Protocol.

G

Geographic features
Points, lines, and areas that comprise a map.

Geographic Information System (GIS)
Any system designed for the capturing, storing, checking, integrating, analyzing and displaying of spatially referenced data about the earth.

Georeference
To establish the relationship between page coordinates on a planar map and known real-world coordinates.

GeoTIFF
An industry-wide standard for specifying information in TIFF tags which was developed by several organizations within the GIS community. GeoTIFF files are raster images that contain georeferencing information as well as image information in a single file.

GIR
Geographic Information Retrieval.

GIS
Geographic Information Systems.

GPS
Global Positioning Systems.

Grain
The frequency of vertices or points forming a line.

Graticule
The spherical co-ordinate system based on lines of latitude and longitude.

Great Circle
A circle formed on the surface of a sphere by a plane that passes through the centre of the sphere. The Equator, each meridian, and each other full circumference of the Earth forms a great circle. The arc of a great circle shows the shortest distance between points on the surface of the Earth.

Grid
A set of regularly spaced sample points or an exact set of reference lines over the earth's surface.

H

Header File
A file associated with an image that contains georeferencing information for the image. File extensions may be TFW or JPW (tiff, jpeg World Files), IRP (Image Report Files) or TAB (Table files).

Hydrography
In its most general definition, hydrography is the description and study of seas, lakes, rivers, and other bodies of water with regard to: the measurement of flow and investigation of the behaviour of streams; the measurement of tides and currents, and the surveying, sounding, and charting of those bodies of water (Webster's Third New International Dictionary, 1993).

Hypsography
Lines or points which depict the relief of the land or contours or spot elevations.

I

Icon
An image representing a software function or tool.

Image
A graphic representation or description of a scene, typically produced by an optical or electronic device. Examples include remotely sensed or satellite data, scanned data, and photographs.

Import sequence
The order of steps required to import data.

Integer
A number without a decimal. Integer values can be less than, equal to, or greater than zero.

Isoline
A line on a surface connecting points of equal value for any of the characteristics used in the representation of the surface.

J

Join Lines
A function in MAPublisher for joining a set of linear features based on a common value such as street name.

JPEG
Joint Photographic Experts Group, is a lossy compression technique for raster file formats.

L

Label
Text used to identify a map feature.

LANDSAT
The generic name for a series of earth resource scanning satellites launched by the United States of America.

Latitude
Angular distance, expressed in degrees and minutes, along a meridian north or south of the equator.

Lat/Long
Latitude/Longitude. Unprojected.

Layer
A designated level in artwork used for storing, organizing and editing graphic or mapping data.

Legend
The section of the map that explains the meaning of the symbols used to depict graphic or geographic elements.

Legend element
A legend key combined with its associated text.

Legend key
The graphic symbol used to illustrate attributes in a legend.

Longitude
The angular distance east or west from a standard meridian to another meridian on the earth's surface; expressed in degrees and minutes.

Line
One of the basic geographical elements, defined by at least two pairs of X,Y co-ordinates; usually too narrow to be an area. See also arc, path and vector.

Linear scale
The relation between a distance on a map and the corresponding distance on the Earth. Scale varies from place to place on every map. The degree of variation depends on the projection used in making the map.

Lossless/Lossy
Lossless techniques compress image data without removing detail; lossy techniques compress images by removing detail.

M

MacOS
Apple Macintosh operating system.

Map
A graphic representation of features of the earth's surface or other geographically distributed phenomena.

Map Anchor
The minimum X and Y coordinates of the data files.

Map Coordinates
The X,Y representations of ellipsoidal earth locations on a mapping plane.

Map Extent
The geographic extent of a geographic data set specified by the minimum bounding rectangle.

MAP Layer
A MAPublisher term for an Illustrator Layer containing Georeferencing Information.

Map Projection
A map projection is a systematic representation of a round body such as the Earth on a flat (plane) surface. Each map projection has specific properties that make it useful for specific purposes. Also see Projection.

MAP Stylesheet
A MAPublisher Stylesheet, containing styles based on attribute information.

MAP View
A MAPublisher term for a distinct coordinate system. A MAP Layer must reside within a MAP View.

Marquee
A dashed rectangle drawn with a selection tool used to select multiple objects.

Meridian
A line of longitude running vertically from the north pole to the south pole.

Meta-Data
Data about data typically including information such as currency, accuracy, and extent. Meta-data is typically stored in data models or data dictionaries.

MIF
The MapInfo Map Interchange Format

Mid/Mif
An ASCII file format pair exported from MapInfo GIS software. The .mif file contains the vector data and the .mid file contains the attribute data

MrSID
MrSID is a file format developed by LizardTech that reduces the size of large, high-resolution images to a fraction of their original size while maintaining the original image quality and integrity.

N

NAD
North American Datum.

Network
Two or more interconnected computer systems for implementation of specific functions or a set of interconnected graphic lines defining some spatial features.

Node
The point or intersection at which areas or lines are joined; endpoints of an arc.

NSDI
National Spatial Data Infrastructure.

O

OS
Operating System.

Orthophoto
A modified copy of a perspective photograph of the earth's surface with distortions due to tilt and relief removed.

Overlay
A set of graphical data that can be superimposed on another set of graphical data through registration to a common co-ordinate system. The process of laying one set of digital spatial data over another for analysis purposes.

P

Page Anchor
The location on the page where the map anchor is placed.

Page Extent
Defines a rectangular portion of the graphics page to be displayed.

Page Size
The size of the drawing page.

Parameters
Variable options or choices; boundaries of operations or of an object.

Path
A line/vector defined by a series of points (a string of X,Y coordinates).

PDF
Portable Document Format. Developed by Adobe, a PDF is a file type, which can be used to cross Macintosh, Windows, DOS, and UNIX platforms.

Pixel
The smallest unit of information in a grid cell map or raster image.

Plug-in filter
A module or modules supplied separately from the Adobe Illustrator program, usually for creating special effects in artwork. The MAPublisher application plug-in filters are modules that enable the incorporation of GIS and mapping capabilities within the Adobe Illustrator graphics environment.

PMS
Pantone™ Matching System.

Point
A discrete location represented by a symbol or label; usually too small to be displayed as an area or line.

Polygon
Any area bounded by a straight or irregular closed line representing a map component or any other graphic feature.

Polyline
A line made up of a sequence of line segments.

Positional Accuracy
The degree to which a position is measured or depicted, relative to its correct position as established by either other features or by other accurate processes.

Postscript
A page description language built into many desktop printers and virtually all high-end printing systems. See the Adobe Illustrator User Guide for more details.

PPC
Power PC (e.g., Macintosh PowerPC processor).

Precision
That which relates to the exactness of the operation by which the result is obtained. The exactness with which a value is expressed, whether the value be right or wrong.

Projection
The representation on a plane surface of any part of the surface of the earth. Also see Map Projection.

R

Raster
A method for the storage, processing and display of spatial data. Each given area is divided into rows and columns, which form a regular grid structure. Each cell must be rectangular in shape, although not necessarily square. Each cell within this matrix contains an attribute value as well as location coordinates. The spatial location of each cell is implicitly contained within the ordering of the matrix, unlike a vector structure which stores topology explicitly. Areas containing the same attribute value are recognized as such, however, raster structures cannot identify the boundaries of such areas as polygons. Also raster structures may lead to increased storage in certain situations, since they store each cell in the matrix regardless of whether it is a feature or simply 'empty' space.

Record
A set of attributes relating to any entity; a set of related, contiguous data.

Redundancy
The duplication of data in a database.

Remote Sensing
The technique of obtaining data about the environment and the surface of the earth from a distance, for example, from aircraft or satellite.

Render
To cause to be or to become, to draw.

Resolution
The number of dots per inch displayed on screen or printed to an output device.

Rhumb line
A line on the surface of the Earth cutting all meridians at the same angle. A rhumb line shows true direction. Parallels and meridians, which also maintain constant true directions, may be considered special cases of the rhumb line. A rhumb line is a straight line on a Mercator projection. A straight rhumb line does not show the shortest distance between points unless the points are on the Equator or on the same meridian.

RS
Remote Sensing.

Rubber sheeting
A procedure to adjust the co-ordinates all of the data points in a dataset to allow a more accurate match between known locations and a few data points within the dataset. Rubber sheeting, also known as rubber banding, preserves the interconnectivity or topology, between points and objects through stretching, shrinking or re-orienting their interconnecting lines.

S

SAIF
Spatial Archive and Interchange Format. SAIF is a Canadian Draft National Standard for Geomatics data interchange. It is a specification for data, which includes an object-oriented data model, and a language for describing both spatial and non-spatial data.

Scale
The relation between the size of an object on a map and its size in the real world.

Scanner
A device for converting images from maps or photographs of part of the real world into digital form automatically.

SDTS
Spatial Data Transfer Standard - a standardized format used by the USGS for transferring earth-referenced spatial data between dissimilar computer systems that includes support for the inclusion of spatial data, attribute, georeferencing, data quality report, data dictionary, and other supporting meta-data within a single file transfer format.

SEA
Self-Extracting Archive, a file compression format for reducing the size of large files for archival or transfers.

Shapefile
The shape file format is a public format that is the native file format for ESRI's ArcView product. This format can be used to export data with attributes from both ArcInfo and ArcView. From ArcInfo the command at the ARC level to create a shape file is arcshape

Sliver
A gap formed when two lines, which should be contiguous, are slightly separated in a graphical representation or map.

Spaghetti Data
Vector data composed of line segments which are not topologically structured or organized into objects and which may not even be geometrically clean. Spaghetti data can be useful however, if all that is required is a visual image or plot of a map and no spatial analysis is to be performed.

Spatial
Of space, a two or three-dimensional position in space.

Spatial Data
Any information about the location and shape of, and relationships among, geographic features. This includes remotely sensed data as well as map data.

Sphere Coordinates
X,Y locations on the ellipsoidal earth, usually expressed in degrees and minutes.

Spline
A function in MAPublisher that improves the smoothness of curved lines, drops redundant points from paths and changes the anchor points on paths to direction points for further manual modifications.

SPOT
An earth resource satellite with high-resolution sensors launched by France in January 1986.

Static Graphic Files
Unchanging and uneditable graphic files.

T

Thematic Map
A map displaying selected kinds of information relating to specific themes, such as soil, land-use etc.

Theme
A user-defined perspective on a geographic dataset specified, if applicable, by a name and feature class or dataset name, attributes of interest, or data classification scheme.

Thiessen Polygon
A polygon bounding the region closer to a point than to any adjacent point. The polygons are drawn so that the lines are of equal distance between two adjacent points. Thiessen polygons, also known as Voronoi diagrams and Dirichlet tessellations, are sometimes used as a crude form of interpolation, particularly within the geosciences.

Thinning
Reducing the number of points defining a line while preserving the essential shape of the line. Common weeding algorithms include: distance traversed algorithm, Nth point selection algorithm, angle selection algorithm, William's point relaxation algorithm and Douglas-Peucker algorithm.

TIFF
Tagged Image File Format, a common raster graphic file format.

Tile
A discrete part of the earth's surface. By splitting a study area into tiles, considerable savings in access times and improvements in system performance can be achieved.

Topographic map
A map showing natural and man-made features as well as relief, often in the form of contours.

Topography
The study of the relief of a given area on the Earth's surface, usually on a large scale, including both natural and man-made features.

Topology
The way in which geographic features relate to each other.

Toponym
The place names of a region or map feature.

Transform
The process of changing the scale, projection, or orientation of a mapped image.

TRIM
A GIS data file format from the Terrain Resource Information Management of British Columbia, Canada.

U

Ungenerate
The file format created by the ArcInfo Ungenerate function.

UNIX
A general-purpose, multi-user computer operating system.

URL
Universal Resource Locator or Internet address.

USGS
United States Geological Survey.

UTM
Universal Transverse Mercator, a common map projection.

UTM Grid
A grid system based upon the Transverse Mercator projection. The UTM grid extends North-South from 80oN to 80oS latitude and, starting at the 180o Meridian, is divided eastwards into 60, 6 degree zones with a half degree overlap with zone one beginning at 180 degrees longitude. The UTM grid is used for topographic maps and georeferencing satellite images.

V

Vector Linework / Artwork
One method of data type, used to store spatial data. Vector data is comprised of lines, defined by beginning and end points, which meet at nodes. The locations of these nodes and the topological structure are usually stored explicitly. Features are defined by their boundaries only and curved lines are represented as a series of connecting arcs. Vector storage involves the storage of explicit topology, which raises overheads, however it only stores those points which define a feature and all space outside these features is 'non-existent'.

Vector Data
An abstraction of the real world where positional data is represented in the form of coordinates. In vector data, the basic units of spatial information are points, lines and polygons. Each of these units is composed simply as a series of one or more coordinate points, for example, a line is a collection of related points, and a polygon is a collection of related lines.

Vertex
One of a set of ordered X,Y coordinates that constitute a line. A points representing spatial X,Y coordinates that occur along a line between the nodes and help define the shape of the arc.

VPF
Vector Product Format. A binary format used by the US Defense Mapping Agency. It is well documented and can be sued as an internal format and as a transfer format. It carries geographic and attribute information but no display data. VPF files are sometimes referred to as VMAP products. MAPublisher 6 does not support VPF files.

W

World file
A file associated with an image that contains georeferencing information for the image. File extensions may be TFW or JPW (tiff, jpeg World Files), IRP (Image Report Files) or TAB (Table files).

WWW
World Wide Web.

Z

Zone
Any well-defined region of more or less belt-like form.

Zoom
To magnify or reduce the current view of a document.

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