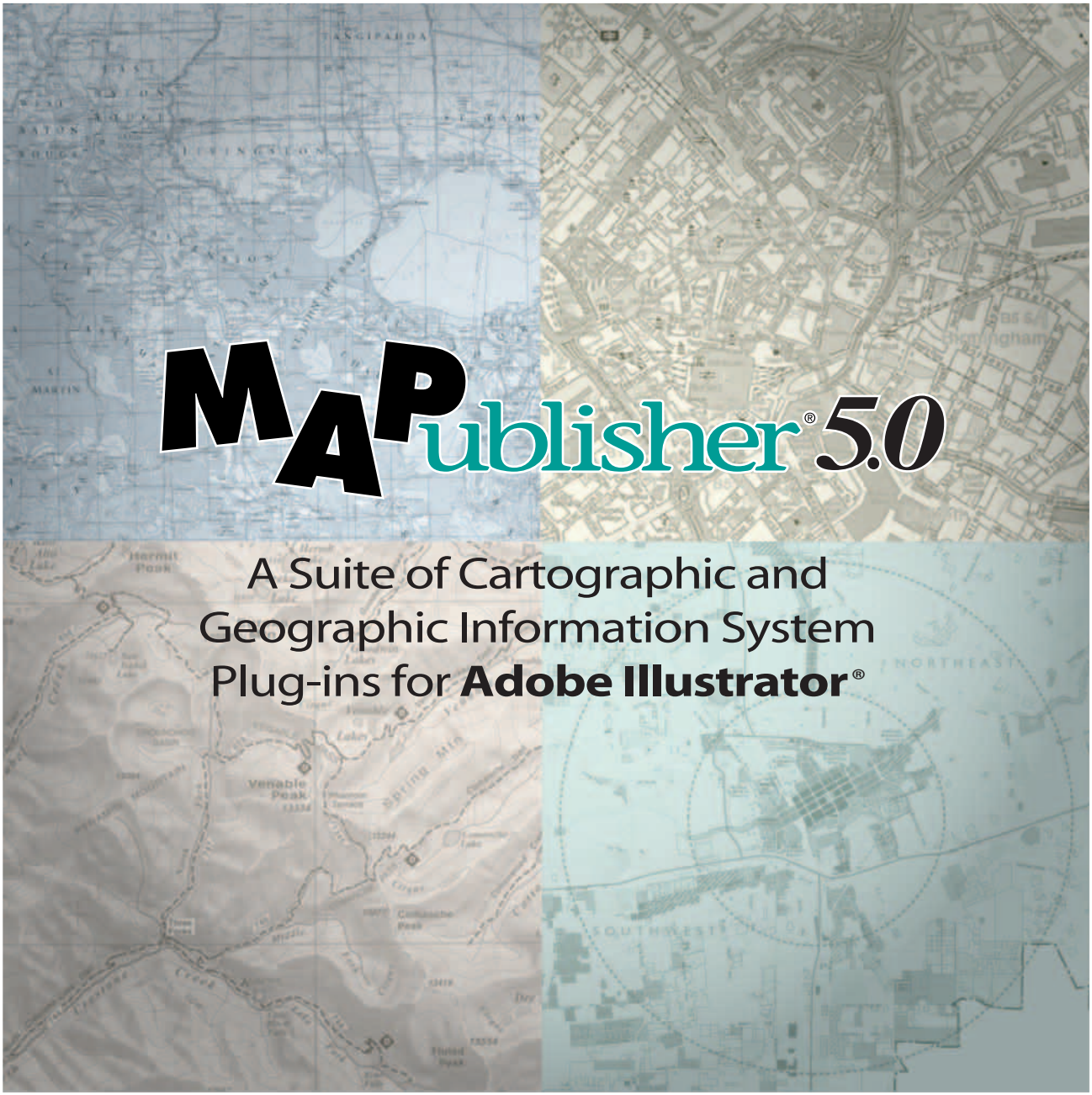

MAPublisher® 5.0

A Suite of Cartographic and Geographic Information System Plug-ins for **Adobe Illustrator®**

User Guide

Apple Macintosh OS9 / OSX

Microsoft Windows 98 / NT / 2000 / ME / XP

Avenza SYSTEMS INC.

When Map Quality Matters

AVENZA™ MAPublisher® 5.0 USER GUIDE

MAPublisher 5.0 for Adobe Illustrator User Guide for Windows and Macintosh.

Avenza Systems Inc.
6505-B Mississauga Road
Mississauga, Ontario, Canada
L5N 1A6
Tel: (905) 567-2811
Fax: (905) 567-5810
Support Phone: (905) 567-4469
Support email: support@avenza.com
Email: info@avenza.com
Web: http://www.avenza.com

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MAPublisher® 5.0

for Adobe® Illustrator®

User Guide

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 5.0 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 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 basic steps necessary to build a map and perform fundamental cartographic and GIS tasks. We have designed this guide to read like a tutorial so for best results, follow the examples step-by-step to begin with. A variety of GIS data has been provided on your MAPublisher 5.0 CD for use with this guide (see Appendix 3) however we encourage you to experiment with your own data to gain additional experience with MAPublisher 5.0's tools and functions. Combined with a basic understanding of Adobe Illustrator, MAPublisher becomes 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 5.0.

CONTENTS

GETTING STARTED

Before installing and using MAPublisher 5.0 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 5.0.

SYSTEM REQUIREMENTS

Macintosh

Casual User

- Adobe Illustrator 10.x
- Mac OS 9.1, 9.2 or Mac OS X 10.1
- Any G3 Processor
- 128 MB RAM
- 30MB hard disk space
- 800x600 colour display
- CD-ROM drive

Power User

- Adobe Illustrator 10.x
- Mac OS 9.1, 9.2 or Mac OS X 10.1
- Any G4 Processor
- 512 MB RAM
- 60MB hard disk space
- 1280x1024 colour display
- CD-ROM drive

Windows

Casual User

- Adobe Illustrator 10.x
- Windows 98, Windows NT, Windows 2000, Windows Me, Windows XP
- Pentium II or equivalent processor
- 128 MB RAM
- 30MB hard disk space
- 800x600 colour display
- CD-ROM drive

Power User

- Adobe Illustrator 10.x
- Windows 98, Windows NT, Windows 2000, Windows Me, Windows XP
- Pentium III or equivalent processor
- 512 MB RAM
- 60MB hard disk space
- 1280x1024 colour display
- CD-ROM drive

INSTALLATION INSTRUCTIONS

Macintosh

1. Make sure that you have Adobe Illustrator 10 installed on your computer.

2. If Adobe Illustrator is running, exit the program.

3. Remove any previous versions of MAPublisher from your Adobe Illustrator Plug-ins folder. This can be accomplished by selecting the MAPublisher folder from the Illustrator Plug-ins folder on your hard drive and dragging it to the trash.

4. Insert your MAPublisher 5.0 CD into your CD-ROM drive. Double-click on the CD icon on your desktop. When the MAPublisher 5.0 window appears, double-click on the Install MAPublisher icon.

5. Click **Continue** at the MAPublisher 5.0 splash screen.

6. Read the Software License Agreement, then click **Continue.**

7. Select the Adobe Illustrator 10 Plug-ins folder as the installation destination. You will have to specify the exact location of your Illustrator 10 Plug-ins folder as no default has been assigned.

8. Click the **Install** button and wait for the plug-ins to be installed.

9. Launch Adobe Illustrator. The MAPublisher filters will now appear under the “Filter” menu.

10. Open a new blank Illustrator document (File ➔ New) in order to enable the MAPublisher Enter Security Code filter.

11. Complete the installation by running the Enter Security Code filter (Filter ➔ 1. MAPublisher ➔ Enter Security Code...) and entering your MAPublisher keycode. Your MAPublisher key code can be found on the card in your MAPublisher 5.0 box or in the email receipt you received with your download if you have purchased an e-commerce version. ***When entering the security code please ensure that all letters are entered in uppercase and that the “-” is included.***

Note: It is EXTREMELY important that you install MAPublisher into the Adobe Illustrator 10 Plug-ins folder. MAPublisher will fail to appear in the Filter menu if it is installed anywhere else. Non US English versions of Adobe Illustrator may have the Plug-ins folder located differently than the US English version. You will have to determine where the Plug-ins folder resides on your system in order to correctly install MAPublisher.

Note: Please be sure to observe step 10 otherwise you will not be able to access the MAPublisher Enter Security Code filter in step 11.

Windows

1. Make sure that you have Adobe Illustrator 10 installed on your computer.

2. If Adobe Illustrator is running, exit the program.

3. Remove any previous versions of MAPublisher from your Adobe Illustrator Plug-ins folder. This can be accomplished using Windows Explorer by selecting the MAPublisher folder from the Illustrator Plug-ins folder and pressing the delete key or dragging it to the recycle bin. You may also run the Add/Remove Programs utility from the Control Panel to uninstall any previous versions of MAPublisher.

4. Insert your MAPublisher 5.0 CD into your CD-ROM drive. When the MAPublisher 5.0 window appears, double-click on the Setup.exe file in the MAPublisher50 directory to start the installation. (Note: If Autorun is disabled on your system, you will have to access your CD-ROM though Windows Explorer and run the Setup.exe file from there.)

5. Click **Next** at the first screen.

6. Read the Software License Agreement, then click **Yes.**

7. Read the installation instructions, then click **Next.**

8. Select the Adobe Illustrator 10 Plug-ins folder. The default install path is C:/Program Files/ Adobe/Illustrator 10/Plug-ins. If you have installed Illustrator in another location you will have to specify the location of your Plug-ins folder.

9. Check that you have set the correct install path and click **Next**. Wait for the files to be copied.

10. Launch Adobe Illustrator. The MAPublisher filters will now appear under the “Filter” menu.

11. Open a new blank Illustrator document (File ➔ New) in order to enable the MAPublisher Enter Security Code filter.

12. Complete the installation by running the Enter Security Code filter (Filter ➔ 1. MAPublisher ➔ Enter Security Code...) and entering your MAPublisher keycode. Your MAPublisher key code can be found on the card in your MAPublisher 5.0 box or in the email receipt you received with your download if you have purchased an e-commerce version. ***When entering the security code please ensure that all letters are entered in uppercase and that the “-” is included.***

Note: It is EXTREMELY important that you install MAPublisher into the Adobe Illustrator 10 Plug-ins folder. MAPublisher will fail to appear in the Filter menu if it is installed anywhere else. Non US English versions of Adobe Illustrator may have the Plug-ins folder located differently than the US English version. You will have to determine where the Plug-ins folder resides on your system in order to correctly install MAPublisher.

Note: Please be sure to observe step 11 otherwise you will not be able to access the MAPublisher Enter Security Code filter in step 12.

PREPARING YOUR 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 Adobe Illustrator Document

1. Create a new Illustrator document by selecting File ➔ New.

2. Select Files ➔ Document Setup.
   - The Adobe Illustrator Document Setup window appears

3. 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.

4. If you have changed the page orientation in the previous step, you should also select File ➔ Print Setup... and change the print settings to landscape as well.

5. Select your desired page units. The default unit type is points.

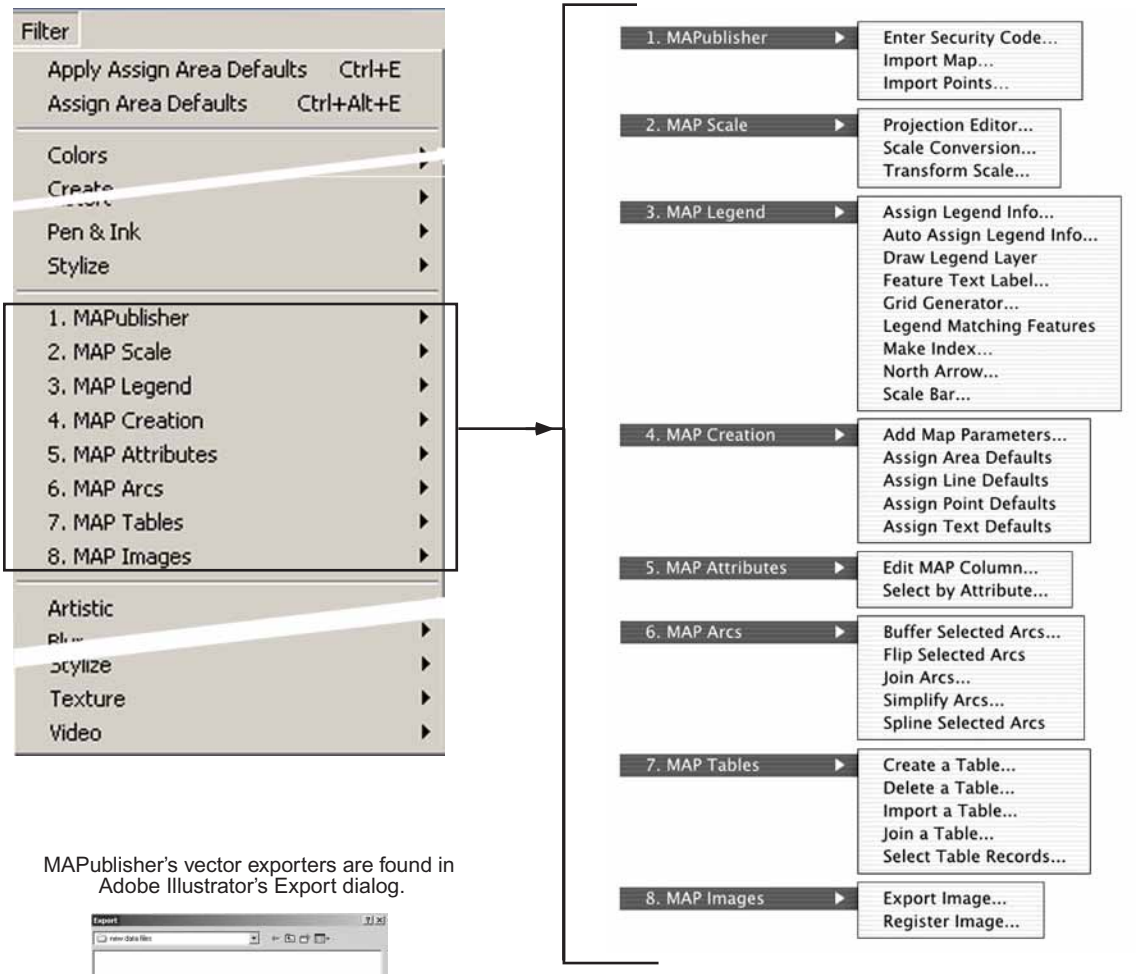
6. Set the page origin to 0,0. To do this, select View ➔ Show Rulers. Click the top left corner of the workspace where the vertical and horizontal rulers intersect and drag the cursor to the bottom left corner of the page. You may also double-click in the small square where the two page rulers intersect.

For more information and details regarding these operations please refer to your Adobe Illustrator user guide.

Note: In step 2 the default page size of 8.5” x 11” is for North American versions of Adobe Illustrator. European and other foreign language versions of Adobe Illustrator may have different default page sizes. Consult your Adobe Illustrator user guide for more information.

THE FILTERS

MAPublisher's main functions install as a suite of plugins under the Adobe Illustrator Filter menu.The individual plugins are grouped into 8 categories under the Filter menu.

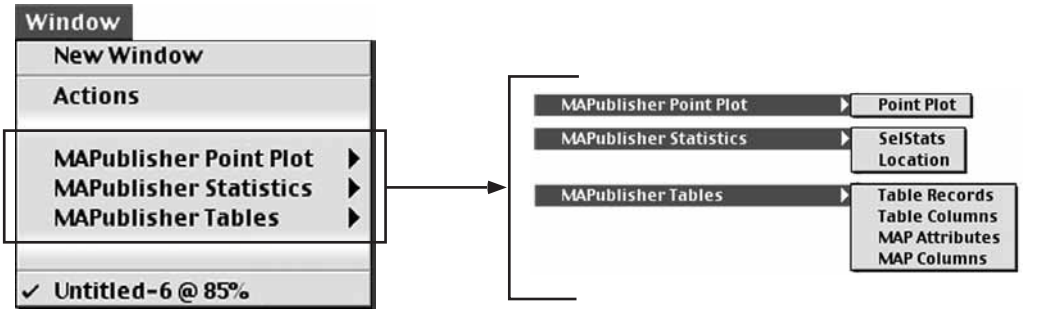


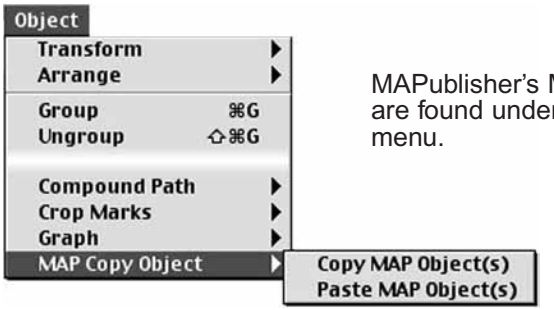
List of MAPublisher plugin categories found under Adobe Illustrator filters menu.

MAPublisher's vector exporters are found in Adobe Illustrator's Export dialog.

The map vector file types that MAPublisher can export to are: ArcInfo e00, ArcView Shapefile and MapInfo mid/mif.

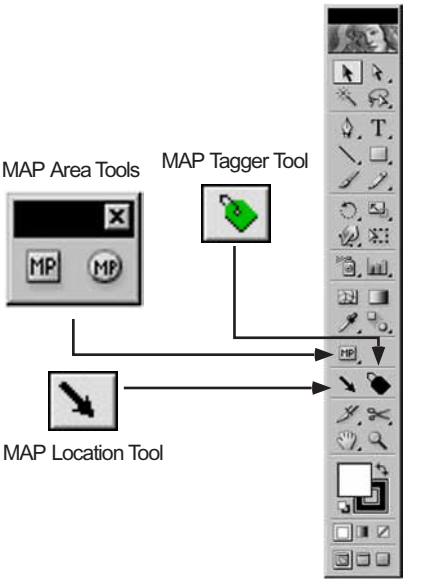
MAPublisher's floating dialog palettes are found under the Adobe Illustrator Window menu.





MAPublisher's MAP Copy and Paste functions are found under Adobe Illustrator's Object menu.

MAPublisher's three plugin tools are located on the Adobe Illustrator Tools palette.



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

MAPublisher 5.0 imports several of the industry leading vector file formats:

- ArcInfo™ Export (.e00)
- ArcInfo™ Ungenerate (.lin, .pnt, or .pol)
- ArcView® Shapefile (.shp + .dbf + .shx)
- AutoCAD® (.dxf)
- MapInfo™ (.mid + .mif)
- MicroStation DGN (.dgn)
- USGS DLG – Optional (.opt, .do)
- USGS DLG – SDTS (????LE##.ddf)

ArcInfo™ Export and Ungenerate

ArcInfo files are created by ESRI's ArcInfo product. MAPublisher will import files with the extensions .lin, .pnt, .pol and .e00. ArcInfo Export files (.e00) are sometimes compressed. Your MAPublisher 5.0 CD contains a special decompression utility, AvzDecompress (Mac) and e00decompress.exe (Windows) which must be run prior to importing such files via the MAPublisher Import filter. Both files can be found in the utilities folder on your MAPublisher 5.0 CD. Please see below for details on running the decompression utility. MAPublisher 5.0 supports many of the most common projections used in .e00 files as well as text rotations during import.

New to MAPublisher 5.0 is import support for .e00 files that contain a combination of areas, lines, points and text in the same .e00 file. Previously in MAPublisher, area features superseded lines and points in this type of .e00 file. MAPublisher 5.0 will now create a separate Illustrator layer for each feature type contained in a single imported .e00 file.

e00 Decompression (Mac)

Run the AvzDecompress program by double-clicking on the program icon. Click **Input File** and navigate to the compressed .e00 file you wish to expand. Click **Save As** and name the new decompressed .e00 file you wish to import using MAPublisher.

e00 Decompression (Windows)

Run the e00decompress.exe program by double-clicking the program icon. Select the compressed .e00 file by clicking on the "•••" next to the empty "Input Filename" box and navigate to the file you wish to decompress. Next, click on the "•••" next to the "Output Filename" box, navigate to the location where you wish to save the decompressed file, and enter a name for the decompressed file. Click the **Go** button to complete the operation.

ArcView® Shapefile

Shape files are most commonly created by ESRI's ArcView product although other products, including MAPublisher 5.0 are capable of generating files in this format. Shapefiles exist as triplets where each file has the same name but ends in one of the extensions .shp, .shx or .dbf. All three files are required in order to successfully import a shapefile into Adobe Illustrator using MAPublisher. ***The important thing to remember when importing shapefiles is that the .shp file must be the one that is selected through the MAPublisher import filter and that all 3 files must be in the same folder.*** MAPublisher will automatically locate and deal with the .dbf and .shx files. At this time, projection information stored in .prj files as well as styles, fonts and colours are not supported.

ESRI shapefiles that contain 3D linear data have an attribute called "PolyLineZ" in the shape column of the attribute table. ShapePolyLineZ lines will not import with MAPublisher as MAPublisher only supports data that is constrained to an x,y Cartesian co-ordinate system. You can amend this problem by converting the data to 2D in ArcView. To do so open the shapefile in ArcView and run the xyz2xy.ave script. The xyz2xy.ave script is included in the samples that come with ArcView. See your ArcView user guide for further details on this procedure.

AutoCAD® .dxf

Drawing Exchange Format (dxf) files are most commonly created by Autodesk's AutoCAD product however other software programs such as Bentley MicroStation and various other computer-aided design (CAD) programs are capable of creating files in this format. This version of MAPublisher will import .dxf files up to and including revision 14 format while preserving all layering, colours, line weights and text. Please note that text is imported using the currently selected Illustrator font however sizes, positions and angles are maintained in most cases. ***It is very important to note that when exporting dxf files from AutoCAD for use in Illustrator with MAPublisher the "Explode Blocks" command must be run in AutoCAD prior to exporting the file.*** DXF files are formatted in either ASCII text or binary format. MAPublisher only supports the ASCII format. Care must be taken when transferring such files on a mixed platform network. If you use ftp be sure to transfer the files with the text option selected.

MapInfo Interchange Format

Files of this type are most commonly created by MapInfo's MapInfo Professional® product. Other products, including MAPublisher 5.0, 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 .mif or .mid. Both files are required in order to successfully import a file of this format to Adobe Illustrator using MAPublisher. ***The important thing to remember when importing MapInfo files is 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.

MAPublisher 5.0 supports the import of line weights (0-7), colours (24 bit RGB), pattern styles for fills (1-8 & 12-71) and strokes (1-71). It also supports fonts (family, style, justification) for text. Colours applied to area boundaries are not supported and will be imported as black. In order to use line patterns and fill patterns you must have opened or accessed the brush library equivalents. Two library files have been created, "pens_midmif.ai" and "brushes_midmif.ai", which provide support for all 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 palettes. MAPublisher will not apply both a colour and pattern to an object. If both exist for a particular object only the pattern will be applied. MAPublisher 5.0 does not support

the MapInfo SYMBOL clause and due to a proprietary MapInfo font naming convention, you may experience inconsistencies when re-importing files exported from MAPublisher. MAPublisher also supports projection information contained in MapInfo mid/mif files. Please note that not all mid/mif files contain projection information.

MicroStation® DGN Format

MicroStation Design Files or DGN (.dgn) are the native files created by Bentley Systems Inc.'s MicroStation product. MAPublisher 5.0 supports the import of MicroStation J, SE and 95 version DGN files. This version of MAPublisher does not support MicroStation V8 DGN files. Users of MicroStation V8 who wish to use their files in MAPublisher must save them in dxf format as MicroStation V8 does not support export of earlier version DGN files.

MAPublisher 5.0 supports the import of 2D MicroStation DGNs, with line weights, fills, and colours maintained. DGN files are imported in their master co-ordinate systems. Colour index numbers (0-255) are translated into Illustrator colours during the import process, where the first primary colour table used in the DGN file is the one utilized in the import to Illustrator. Line weights (0-31) are translated to stroke width on import. Text is imported at the currently selected Illustrator font and size, with any assigned DGN text rotations applied.

DGN files will be imported to a single Adobe Illustrator layer. However, all MicroStation level information is retained as an attribute on the resultant map layer in a MAPublisher attribute column called "level". MAPublisher's Select by Attribute and Map Copy/Paste functions can be used to easily separate features into individual Illustrator layers based on MicroStation levels.

In MicroStation, an "active angle" can be set for a given document. This is a rotational value that is applied to the entire geographic co-ordinate setup for the DGN document. MAPublisher 5.0 will recognize the active angle in a DGN file upon import and draw the resulting Illustrator artwork relative to the active angle.

Caution should be used when importing files containing complex shapes. Complex shapes that exist in a DGN file may be imported with a stroke colour only. If problems are encountered with scaling to fit the page you may be required to place a bounding box (rectangle) in the DGN file which will ultimately represent the page extents.

USGS Formats (optional & SDTS)

The United States Geological Survey (USGS) maintains and disseminates vector map data in two major formats, optional and SDTS. Files in the optional format have the extensions .opt and .do and files in the SDTS format have the extension .ddf. MAPublisher 5.0 imports SDTS files that have the characters "LE" in the fifth and sixth positions of the file name (ex.TR01**LE**06.ddf). The LE stands for line entities and it is files of this nomenclature that contain the actual lines and vertices. They are usually the largest file of a given data set. MAPublisher supports projection information contained in SDTS files. ***When downloading and decompressing dlg files from the USGS websites you may encounter files that have two periods (.) in their file name (ex. 506875.HY.opt). In order to import such files with MAPublisher all periods except the last one must be removed by renaming the file (ex. 506875HY.opt). Also, when decompressing DLG files, check the decompression settings. Some decompression utilities automatically default to "Smart TAR CR/LT translation". This setting must NOT be used as it may introduce errors to the data. Prior to decompressing the archive you should disable the "Smart TAR CR/LT translation" option.***

ADDITIONAL MAPUBLISHER CONSIDERATIONS

The following items are additional important data and file considerations when working with MAPublisher. Please read the following recommendations carefully in order to get the most out of MAPublisher and improve your overall mapmaking experience.

Importing

It is advisable to import GIS files from your local hard drive or removable media source such as a CD-ROM, DVD or ZIP disk, etc. If your data resides on a LAN or other data network, you should copy the files to a folder on a local drive before importing. When moving or copying data remember to move or copy all the file components that comprise the GIS data file type that MAPublisher requires for a successful import (see pages 15-17). In addition you should ensure that each file name does not contain any spaces, extra periods (beyond the one that precedes the file extension) or other illegal characters.

MAPublisher does not support three-dimensional GIS data. Many GIS applications that support 3D data offer export support in 2D formats. Please consult your GIS application's documentation or product vendor for details on facilitating a conversion from 3D to 2D prior to attempting an import operation with MAPublisher. See also ArcView Shapefile, page 16, for more information.

Many GIS data files come in compressed archive formats such as .zip, .sit or .tar. Be sure to decompress such files before attempting an import with MAPublisher. Care should be taken when data is decompressed. Decompression utilities may generate extra periods in filenames. For example some files may contain two periods (ex. "123456.HY.opt"). Rename these files so that the only period in the filename is the one immediately preceding the file extension (ex. "123456HY.opt"). If you download DLG files from the USGS, you must check your decompression settings. Some decompression utilities, such as WinZip, automatically default to "Smart TAR CR/LF translation". This setting must not be used as it will introduce errors in the data. In WinZip, navigate to Options ➔ Configuration, click the "Miscellaneous" tab, and switch off "TAR file smart CR/LF conversion", to unzipping your files.

Exporting

It is advisable to export or save files to your local hard drive or removable media source. When using Windows NT, 2000 or XP it is further advisable to avoid exporting or saving directly to the desktop. Do not export or save to folders which contain periods or spaces. In addition you should ensure that each file name does not contain any spaces, extra periods (beyond the one that precedes the file extension) or other illegal characters.

When saving or exporting files that contain map attribute information make sure that the width of each attribute column is sufficient to hold all the attribute information (ie. ensure that the width of each column is at least as wide as the longest string of data contained in that column). If a character string exceeds the width of the column in which it is contained, the attribute value will be truncated.

Adobe Illustrator Compatibility

This version of MAPublisher has been specially engineered to operate with Adobe Illustrator 10. Illustrator 10 files that contain MAPublisher information are backwards compatible with Illustrator 9 format only. Saving to a version of Adobe Illustrator prior to version 9.0 may result in the loss of geo-referencing information from your Illustrator 10/MAPublisher 5 file. Always make a backup copy in Illustrator 10 format before saving to an earlier version of Adobe Illustrator.

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 Import Map filter (see pages 15-17). In cases where the file format native to a particular mapping application is not supported by the Import Map filter you can often request the data provider to export a file in one of the supported formats.

When receiving data it is especially important to obtain as much meta-data about the files as possible, especially concerning projections. You must first determine if the data is projected. The majority of the data you receive will be unprojected (ie. in lat/long). 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 must be aware of the following. MAPublisher will import projected data with a true scale and appropriate map anchors only. Unlike unprojected data, these map anchors will not be in lat/long, but rather in a co-ordinate system appropriate for the particular projection. When importing projected data you should select the same units as were used in the reprojection process. Therefore a key piece of information you obtain from your data supplier is the units that were used when the data was reprojected (ie. meters, km, miles etc.). In the Import Map dialog select your file, select your units, then click **Defaults**. This will ensure correct area and perimeter values in MAPublisher. In order to optimize the use of MAPublisher's tools, such as Point Plot, you will be required to enter all the projection parameters of the file after the file has been imported. For most file formats the name of the projection will not be recognized by MAPublisher. In order to enter projection details accurately you must be supplied with the projection name, and the additional parameters which are necessary for the projection in question. This information should be entered in the 'Store Proj Info' section of the Projection Editor (see Page 52).

In summary, when obtaining map data the following information should accompany the data files:

- units of measure (ie. meters, kilometers, miles etc.)
- projection name
- state plane*
- ellipsoid (named or custom parameters)
- central meridian & central parallel
- UTM zone*
- 1st & 2nd latitudes*
- latitude of true scale*
- false northing & easting*

* if appropriate

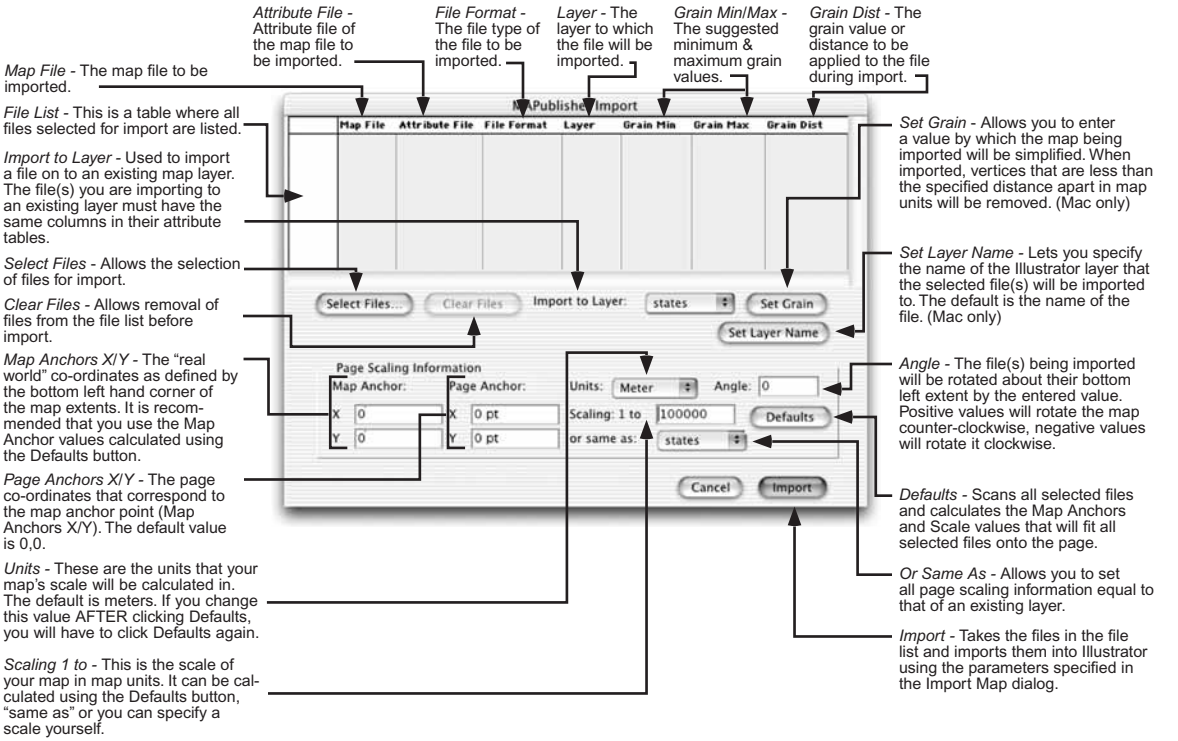
IMPORTING MAP DATA

IMPORT MAP

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

The MAPublisher Import Map Dialog

Below is a diagram of the MAPublisher Import Map dialog along with an explanation of each of its controls and boxes. Please familiarize yourself with this diagram before continuing to the examples on the following pages.



Tip: Avoid importing files over a network connection on the Macintosh platform. Occasionally shape files and mid/mif files may fail to import correctly under such conditions. If you are in a network environment we advise you to copy the desired files to a local drive before using the MAPublisher Import Map dialog.

Tip: Avoid using the period character (.) in folder names as the MAPublisher Import Map dialog may fail to correctly interpret the map attribute file name and as such will not be able to import the file correctly.

Importing a Single Map File (Basic Import)

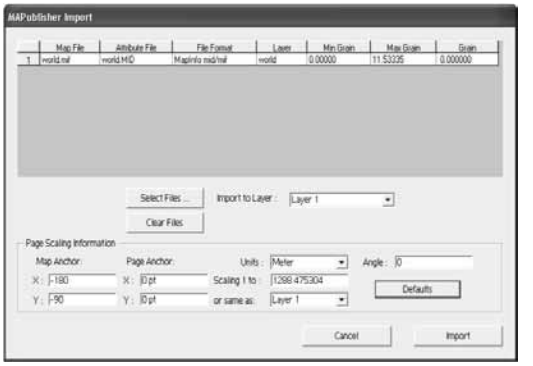
The following steps will acquaint you with the method of importing single map files by using sample data which can be found on your MAPublisher 5.0 CD in the tutorial_data folder. Please locate that folder on your CD before proceeding.

1. Start by creating a new Illustrator page in landscape orientation. Be sure to reset the rulers so that the 0,0 point is at lower left corner of the page (see page 12).

2. Select Filter ➔ 1. MAPublisher ➔ Import Map.
   - *The MAPublisher Import Map dialog appears.*

3. Click the **Select Files** button.
   - *The file selection dialog appears.*

4. Locate and select the world.mif file from the tutorial_data folder on your MAPublisher CD and click **Open**.
   - *The dialog closes and the selected file appears in the file list in the MAPublisher import window.*



MAPublisher import window after clicking **Defaults**.

5. Click **Defaults** to automatically calculate the map anchors and the map scale that will best fit the map to your page. The scale is automatically based on meters. If you want to base the map on another set of units (ie. kilometers, miles etc.), select the new units from the "Units" drop-down list and click **Defaults**.
   - *The Map Anchors and Scale are calculated and displayed in the appropriate text boxes in the MAPublisher Import window.*

6. If desired, set the Page Anchors and Angle values. The Page Anchors are based on the page units and identify the page location that corresponds to the Map Anchor location. These will offset the map from the page origin by the values entered. The Angle value will rotate the map around the map's origin. A positive value will rotate the map counter-clockwise; a negative value will rotate the map clockwise. After checking all of your values to see that they are correct, click the **Import** button.
   - *The Import Map dialog closes and the selected map file is imported based on the specifications entered in the dialog box.*


Adobe Illustrator after multiple file import of world.mif file.

Importing Multiple Map Files at Once

The MAPublisher 5.0 import filter allows for the import of multiple map files at a single time. Mixed formats (ex. shape and mid/mif at the same time) are not supported however mixed feature types (ex. areas and lines) are supported. ***When importing multiple files, all files must be in the same projection.***

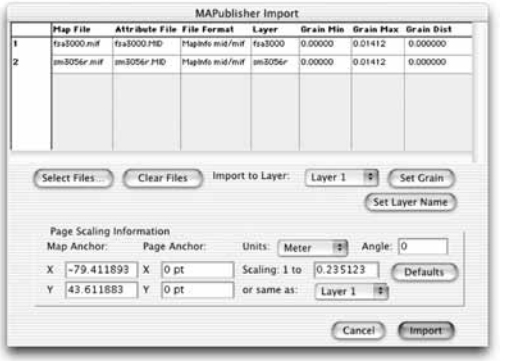
1. Select Filter ➔ 1. MAPublisher ➔ Import Map.
   - The MAPublisher Import Map window appears.

2. Click on the **Select Files** button.
   - The File Selection dialog appears.

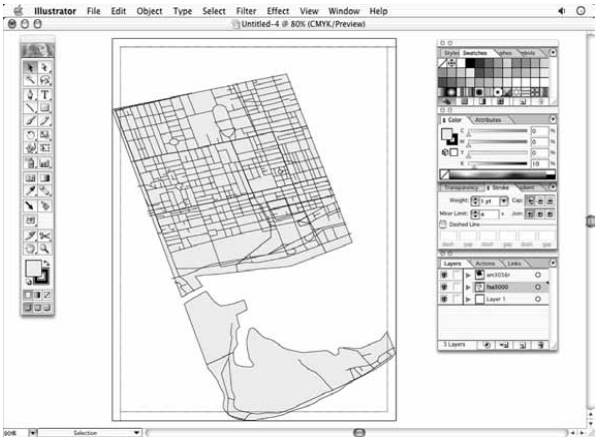
3. Locate and select the fsatoronto.mif and torontostreets.mif files from the tutorial_data folder on your MAPublisher CD and click **Open**. Use the Shift key (Mac) or the Control key (Windows) to select the two files. Files may also be added to the import list one at a time by clicking on the **Select File** button again and selecting additional files. Files may be removed from the list by selecting them and clicking **Clear Files**.
   - The selected files are added/removed from the import list.

4. Click on the **Defaults** button to automatically calculate the map anchors and the scale that will best fit the map to your page. The values will be calculated based on all the files in the list so that they will all fit onto the page and tile or overlap correctly with each other.
   - The Map Anchors and Scale are calculated and displayed in the appropriate text boxes.

5. If desired, set the Page Anchors and Angle values. After checking all of your values to see that they are correct, click on the **Import** button.
   - The Import Map dialog closes and the selected map files are imported.



Import window showing multiple file import



Adobe Illustrator after multiple file import of fsatoronto and torontostreets files.

Setting the Illustrator Layer Name for Imported Files

With MAPublisher 5.0 you can pre-name the Illustrator layer to which one or more of your map files will be imported. The default layer name that MAPublisher uses is based upon the actual map file name but this is not always appropriate. For example, you may wish to have a road file called ou812.mif imported to a layer called “roads” rather than a layer called “ou812”.

After selecting the file or files you wish to import and having them appear in the import list you can name the import layer or layers as follows:

Mac Users

Select a file by clicking on the number to the very left of the file name in the file list. Next, click on the **Set Layer Name** button. Enter the layer name you wish to use (ie. roads) in the dialog box that appears and click **OK**.
- The “Layer” column of the selected files is updated to reflect the specified layer name.

Windows Users

Change the import layer name by double-clicking directly in the box in the “Layer” column associated with the map file for which you want to change the layer name. Enter the desired layer name accordingly.
- The “Layer” column of the selected file now displays the specified layer name.

After the desired layer names have been applied, click on the **Defaults** button or use “same as” to calculate the scale and map anchors. The values will be calculated based on all the files in the list so that they will all fit onto the page.
- The Map Anchors and Scale are calculated and displayed in the appropriate text boxes.

If desired, set the Page Anchors and Angle values. After checking all of your values to see that they are correct, click on the **Import** button.
- The Import Map dialog closes and the selected map file is imported based on the specifications entered in the dialog box. The layers that are created will reflect the layer names specified in the Import Map dialog.

Importing Map Files to Match an Existing Map Layer

It is often necessary to import map data files to pre-existing map documents so that a common scale is maintained. With MAPublisher it is possible to import new map files with a scale and map anchors as defined by an existing map layer. This is done to ensure that common geography is maintained and that the layers tile or overlap properly. The following example illustrates how to import map data based on the parameters of an existing layer.

1. Follow the example on page 21 to import the fsatoronto.mif file to a new Illustrator document.

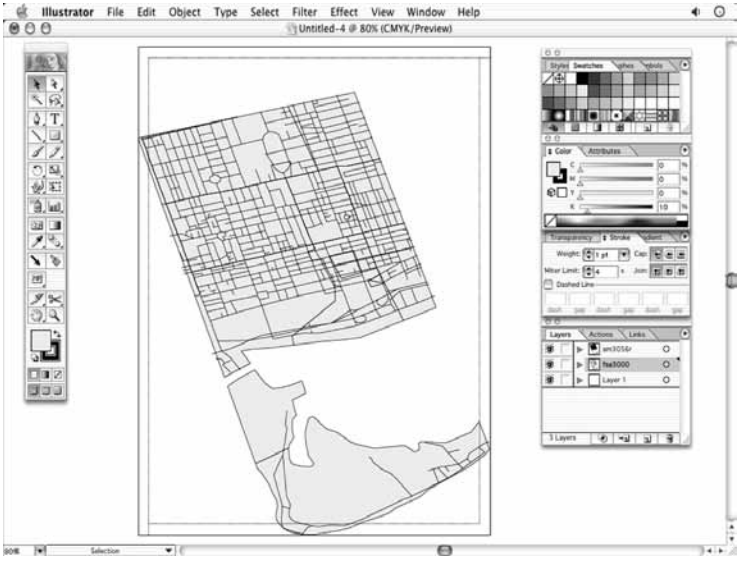
2. Select Filter ➔ 1. MAPublisher ➔ Import Map.
   - The MAPublisher Import Map dialog appears.

3. Select the torontostreets.mif file from the tutorial_data folder on your MAPublisher CD.
   - The selected file is placed in the import list.

4. Click the “or same as” dropdown list and select the “fsatoronto” layer you imported in step 1.
   - All page scaling information is updated to reflect that of the selected layer. The ***Defaults*** *button is also disabled.*

5. Check that all values are correct and click on the **Import** button.
   - The Import Map dialog closes and the selected map file is imported based on the specifications entered in the dialog box. In this case, the two layers will geographically match up on the page.

Note: This process produces the exact same result as the Importing Multiple Map Files at Once process described on page 22.



Adobe Illustrator after “same as” file import.

Note: When importing map files to match an existing map layer, both the file being imported and the existing map layer must be in the same geographic projection.

Importing Files to an Existing Layer

MAPublisher 5.0 allows for GIS map data to be imported to a pre-existing map layer. This can be very useful if, for example, roads from neighbouring areas are contained in separate data files but you want them to appear on the same Illustrator layer.

Note: When importing GIS data to an existing layer the attribute tables of the file to be imported and of the existing layer must match (ie. they must have the same number of attribute columns and the same column names). In addition, the file being imported must be in the same projection as the existing map layer.

Note: DXF files and e00 files cannot be imported to an existing Illustrator layer as these two formats often contain multiple layers themselves with different topologies and attribute structures. A warning will appear if you attempt such an operation.

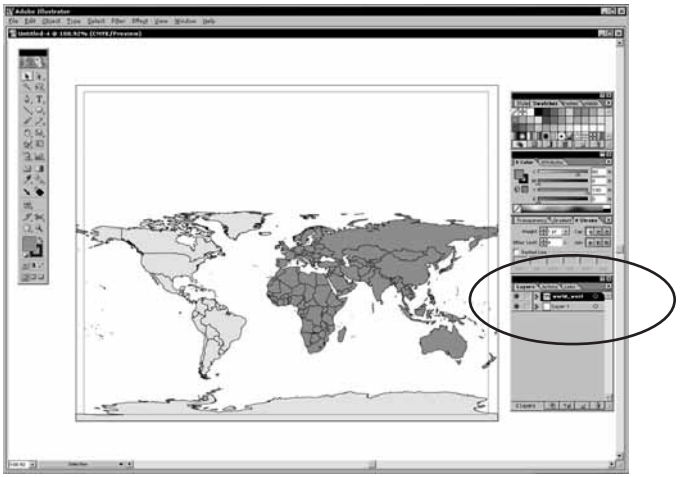
1. Follow the example on page 21 to import the world_west.mif file to a new Illustrator document.

2. Select Filter ➔ 1. MAPublisher ➔ Import Map.
   - The MAPublisher Import Map dialog appears.

3. Locate and select the world_east.mif file in the tutorial_data folder on your MAPublisher CD.
   - The selected file is placed in the import list.

4. Select the world_east.mif file in the import list by clicking on the number to the very left of the file name in the import file list. Click on the "Import to Layer:" dropdown list and select the "world_west" layer you just imported to in step 1.
   - The Page Scaling information is updated to reflect the layer being imported to and the "Layer" column of the file to be imported in the import list is updated to match the layer name you are importing to.

5. Check that all values are correct and click the **Import** button.
   - The Import Map dialog closes and the selected map file is imported to the selected layer.



Adobe Illustrator after importing to an existing layer. Note that although 2 different files were imported individually, only one layer name appears in the layers palette.

Importing Map Files with a Grain

When importing a very complex map file with a large number of points or vertices you may wish, or find it necessary, to simplify the file by culling some of these features. MAPublisher accomplishes this with the Grain function. The MAPublisher import engine automatically calculates minimum and maximum values for the grain, or "file thinner", and displays them in the import map dialog table. When using the grain function it is a good idea to experiment with different values in order to obtain the desired results. The basic idea is to enter as low a value as possible while still retaining the accuracy of the view.

Note: When importing USGS DLG .opt and .do files no grain values will be calculated and none will be applied to the file during the import process.

1. Select Filter ➔ 1. MAPublisher ➔ Import Map.
   - The MAPublisher Import Map dialog appears.

2. Locate and select the greenland.mif file from the tutorial_data folder on your MAPublisher CD and click **Open**.
   - The selected file is added to the list. Suggested Min/Max grain values are calculated and displayed in the file import table. Suggested Min/Max grain values will vary depending on the complexity and the scale of the file.

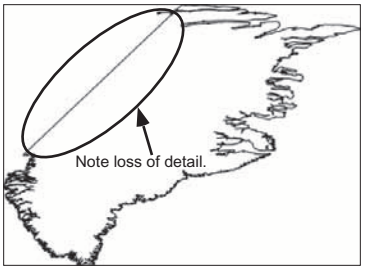
3. ***Mac:*** Select the desired file in the import list and click the **Set Grain** button. Enter a value into the text box (for best results use a value between the Suggested Min/Max in the file list, such as 0.01) and click OK.

   Windows: Double-click on the cell in the Grain column of the import list of the file to which you want a grain value applied. The desired grain value may be entered directly into the cell just as one would do with a spreadsheet program. Enter a value into the text box (for best results use a value between the Suggested Min/Max in the file list, such as 0.01).

   Different grain values can be added to different files and not every file in the list must have a grain value assigned to it.
   - The "Grain" column in the File List is updated as you enter grain values for the selected files.

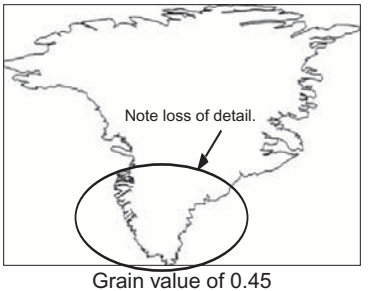
4. Click on the **Defaults** button to calculate the Scale and Map Anchors and click **Import**.
   - The Import Map dialog closes and the file is imported based on the Page Scaling information. It is also simplified based on the assigned grain values.

The images below show how grain values of .01 and .45, as well as no grain, affect the greenland.mif file. The file is originally 1,372KB in size. Importing it with a grain of .01 and then exporting it back to mid/mif format will produce a file of size 662KB with little reduction in detail.



No Grain


Grain value of 0.01



Grain value of 0.45

IMPORTING POINTS

The MAPublisher Import Points filter allows the import of delimited ASCII text files as point data provided they contain co-ordinate values. The Import Points filter can be found at Filter ➔ 1. MAPublisher ➔ Import Points.

A typical file of this nature might be set up as follows:

```
"X value","Y value","Name","Population"
"3.4","5.4","Metropolis","2345000"
"6.54","21.4","Gotham City","1234000"
"6.32","66.6","Smallville","54"
```

Notice how the first row contains column headers. MAPublisher can usually determine whether the first line of the file contains column headers. If the file does not appear to contain column headers, MAPublisher will assign the default headers "Column1", "Column2" and so on.

Please familiarize yourself with the Import Points filter by reviewing the diagram below.

Select File - Allows you to select the file you wish to import.

New Layer - The new layer name is placed here. The default is the name of the file but it can be changed if you wish.

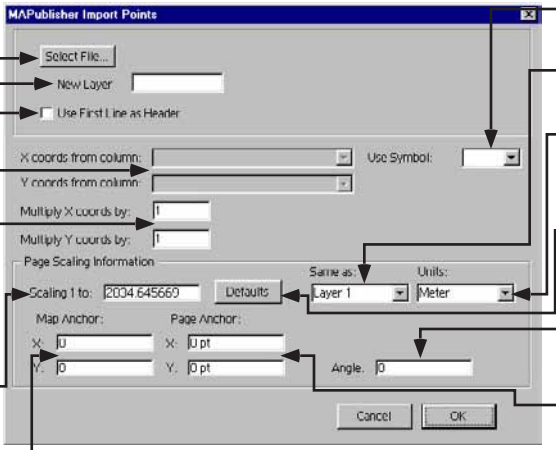
Use First Line as Header - If the first line of the text file you are importing contains column headings, check this box.

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

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

Scaling 1 to - This is the scale of your map in map units. It can be calculated using the Defaults button or "same as" or you can specify a scale yourself.

Map Anchors X/Y - The "real world" co-ordinates as defined by the bottom left hand corner of the map extents. It is recommended that you use the Map Anchor values calculated using the Defaults button.



Use Symbol - Allows you to choose one of three symbols that will be used to represent the points on the page.

Same As - Allows you to set all page scaling information equal to that of an existing layer.

Units - These are the units that your map's scale will be calculated in. The default is meters. If you change this value AFTER clicking Defaults, you will have to click Defaults again.

Defaults - Scans the selected file and calculates the Map Anchors and Scale values that will fit the selected file onto the page.

Angle - The file being imported will be rotated about its bottom left extent by the entered value. Positive values will rotate the map counter-clockwise, negative values will rotate it clockwise.

Page Anchors X/Y - The values entered in the Page Anchors boxes will offset the map from the page origin by the entered value (in page units). Page Anchors are the page co-ordinates that correspond to the Map Anchors location.

The MAPublisher Import Points filter supports the import of delimited ASCII files that contain any of the following delimiters between data values: comma, return, end of line and tab.

Note: MAPublisher imports point data as text when using either the Import MAP or Import Points filters. The default font and font size used to display imported points immediately after import is whichever font and size are currently selected when the import operation is performed. The default symbol used is the plus sign (+). Although the symbol can be changed prior to import when using the Import Points filter, this is not possible when importing a GIS point file using the Import MAP filter. The symbols (fonts) particular to any set of points can be changed using the MAPublisher legend filters (see Point Legends, page 63).

Note: The text anchor, not the centre of the symbol, is placed over the geographic co-ordinate of the point. Adjustments can be made using the steps for Repositioning Point Symbols on page 33.

Importing a Delimited ASCII File as Point Data

1. Select Filter ➔ 1. MAPublisher ➔ Import Points.
   - The Import Points dialog box appears.

2. Click on the **Select File** button.
   - The File Selection dialog appears.

3. Select the az_deci(partial).txt file from the tutorial_data folder on your MAPublisher 5.0 CD and click on the **Open** button.
   - The file's name appears next to the **Select File** *button and a layer name is placed in the "New Layer" box. You may change the layer name if desired.*

4. Select the column of the file to be used as the points' X co-ordinates and Y co-ordinates using the "X/Y Coords from column:" dropdown lists. The dropdown lists are filled with all of the column names found in your ASCII file. For this file, use "Column 10" for the X co-ordinates and "Column 9" for the Y co-ordinates.

5. Choose the symbol that will be used to represent your points on the page using the "Use Symbol" dropdown list.

6. *(Optional)* Set the values by which the X and Y co-ordinates will be multiplied by before they are imported by entering values in the "Multiply X/Y coords by" text boxes. You can multiply the X co-ordinates by a different value than the Y co-ordinates if you want. The default for each is 1, which will not change your values at all.

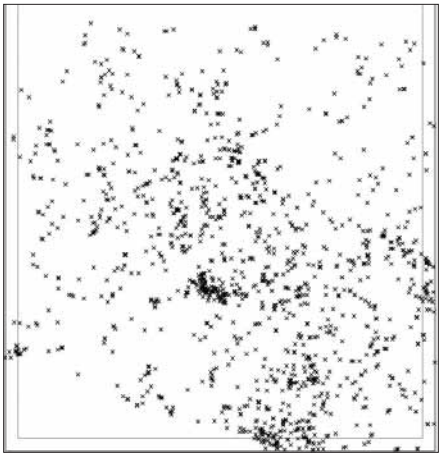
7. To set the Scale and Map Anchors, click on the **Defaults** button to calculate values based on the points' co-ordinates. Enter Page Anchors and Angle values as desired and click **OK**.

   OR

   You can also use the "Same as Layer:" dropdown list to set the Page Scaling information to that of another layer and then click **OK**.

   OR

   Enter all values manually and click **OK**.
   - The Import Points dialog closes and the points are placed on the page as specified. All columns that were in the file are imported as attribute data for the created points.



Imported AZ_Deci(partial).txt file as point data.

Creating a Delimited ASCII Point File

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 co-ordinates 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.). One column in the file must contain the X co-ordinates of the points and another must contain the Y co-ordinates. You can add as many additional columns as you wish containing additional information to be imported as attribute data.

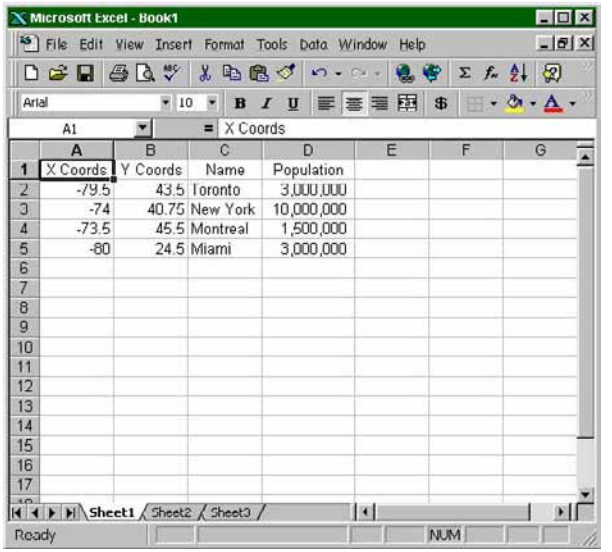
If you are using a text editor, you can simply type in your data in the following format:

```
"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: Negative values for the X and Y co-ordinates denote west longitudes and south latitudes, respectively.

Note: Make sure to enter a carriage return using the "enter" key on your keyboard after the last line of data otherwise the last line will be ignored by the MAPublisher Import Points filter.

If you are using a speadsheet 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 speadsheet 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 5.0.



Microsoft Excel window showing user-created point file for use in Adobe Illustrator with MAPublisher 5.0

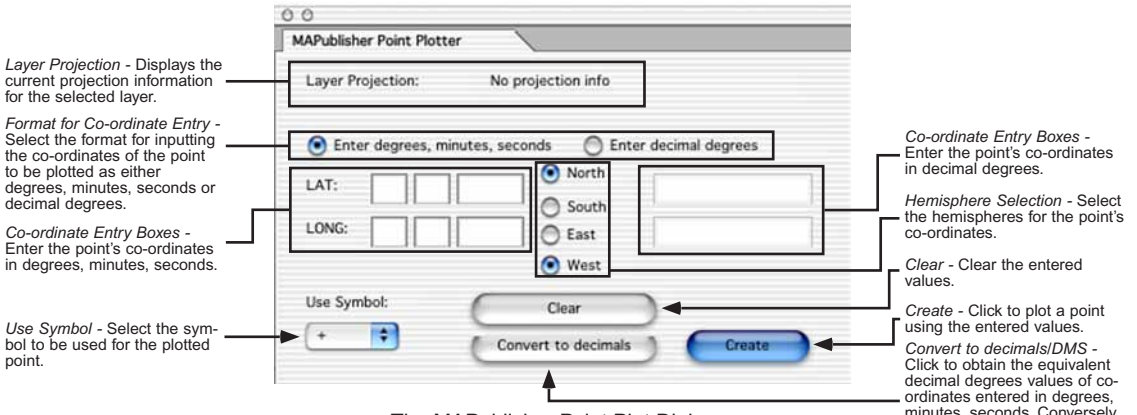
POINT PLOT

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. Or your map may in be a projection such as UTM or Albers and the co-ordinates for your point locations are in a lat/long format such as degrees, minutes, seconds (DMS) or decimal degrees.

Provided you have the real-world co-ordinates, in either DMS or decimal degrees, for the locations you wish to plot, you can use the MAPublisher Point Plotter to have your points automatically plotted at their correct locations on your map. The MAPublisher Point Plotter supports the input of co-ordinates in either DMS or decimal degrees and will create a point for each entered co-ordinate pair using the selected symbol. If your map layers are already projected, the MAPublisher Point Plotter will convert your entered DMS or decimal degrees co-ordinates into the co-ordinates of your projected map layer and plot the points in their correct locations.

Note: The MAPublisher Point Plotter will only create a point on a projected layer if the layer is recognized by MAPublisher as being in a particular projection. If the layer was originally projected using MAPublisher then the projection will be recognized. If the data file was projected outside of MAPublisher prior to import to Illustrator the projection may not be recognized. You can determine if the projection is recognized by referencing the top section of the MAPublisher Point Plotter dialog window. If the projection is not recognized by MAPublisher you can use the MAPublisher Projection Editor (see page 52) to assign the known projection, after which the MAPublisher Point Plotter may be used.

The MAPublisher Point Plotter may also be used as a DMS to decimal degrees and decimal degrees to DMS conversion calculator for quickly determining the equivalent values for co-ordinates in one expression format or the other.



The MAPublisher Point Plot Dialog

Note: Points created using the MAPublisher Point Plot function will have the anchor point of the text symbol (lower left corner of the bounding box) placed at the actual geographic co-ordinate location of the point. Adjustments can be made by following the procedure for Repositioning Point Symbols found on page 33.

Plotting a Point Using the MAPublisher Point Plotter

1. Open the USA.ai file from the tutorial_data folder on your MAPublisher 5.0 CD.

Follow steps 2-4 if you wish to plot your points on a new layer. If you wish to plot the points on the existing USA layer proceed to step 5.

2. Create a new Illustrator layer and rename it “cities”.

3. Add MAP Parameters to the “cities” layer by following the steps on page 77 using the “or same as” option and referencing the “USA” layer.

4. Set the projection for the “cities” layer by following steps 4 and 5 on page 53 using the “or same as” option and referencing the “USA” layer.

5. Select the desired font and font size for the point you will plot using the Illustrator text tools. For this example we used an 8pt font size.

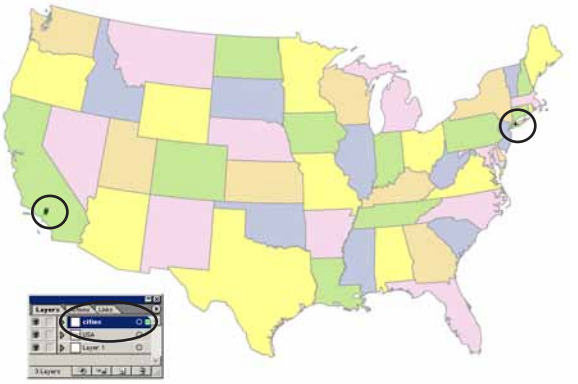
6. Select the desired layer for the points to be plotted and open the MAPublisher Point Plot window by selecting Window ➔ MAPublisher Point Plot ➔ Point Plot.

7. Click the “Enter degrees, minutes, seconds” radio button to signify that you want to enter the point co-ordinates in DMS. To plot a point for New York City, enter 40, 40 & 14 in the LAT (latitude) boxes and click the “North” radio button and then enter 73, 56 & 39 in the LONG (longitude) boxes and click the “West” radio button. Select a desired symbol from the “Symbol” dropdown menu and click **Create**.
   - At point will be plotted at the location of New York City (40°41’14”N, 73°56’39”W).

8. Click on the “Clear” button to remove the previous entries.

9. Click the “Enter decimal degrees” radio button to signify that you want to enter the next point co-ordinates in decimal degrees. To plot a point for Los Angeles, enter 34.1151 in the LAT (latitude) box and -118.4183 in the LONG (longitude) box. Select a desired symbol from the “Symbol” dropdown menu and click **Create**.
   - At point will be plotted at the location of Los Angeles (34.1151 degrees, -118.4183 degrees).

Note: When entering co-ordinate values in decimal degrees, positive values indicate north and east locations and negative values indicate south and west locations.



Results of using the MAPublisher Point Plotter to create points for New York CIty and Los Angeles.

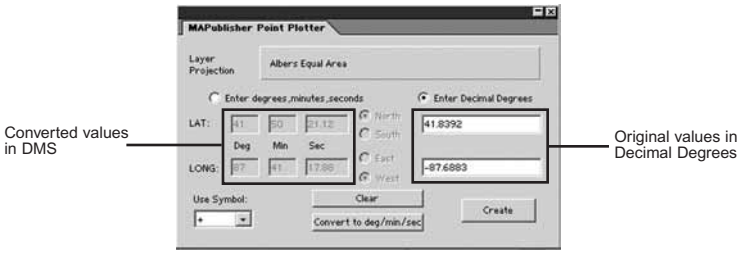
Converting Between Degrees, Minutes, Seconds and Decimal Degrees

Using MAPublisher's Point Plot you can easily convert between degrees, minutes, seconds and decimal degrees formats and also retain the ability to plot points in either format.

1. Follow steps 1 through 6 of the example on the previous page for Plotting a Point Using the MAPublisher Point Plotter.

2. Click on the "Enter decimal degrees" radio button and enter 41.8392 in the LAT box and -87.6883 in the LONG box.
   - These figures represent the decimal degrees co-ordinates for Chicago.

3. Click on the "Convert to deg/min/sec" button.
   - The values entered in the previous step will now be converted to DMS and the converted values will be displayed in the DMS value boxes.



MAPublisher Point Plotter showing conversion from decimal degrees to DMS.

4. To plot the point for Chicago using the entered decimal degrees values click the **Create** button.

5. To plot the point for Chicago using the converted DMS values click the "Enter degrees, minutes, seconds" radio button and then click the "Create" button.

Note: Steps 4 and 5 will yield the same result.

Note: To use the Point Plotter as a simple DMS to decimal degrees or decimal degress to DMS conversion calculator omit steps 4 and 5.

Note: If a layer is reprojected while the Point Plotter window is open, the Point Plotter dialog must be closed and reopened before any points are plotted to that layer in order to allow the new projection to be recognized by the Point Plotter.

REPOSITIONING POINT SYMBOLS

As mentioned throughout this manual when discussing point data and point symbols, points that have been imported using either the Import Map or Import Points filters or created using the Point Plotter, will be initially positioned with the text anchor point (lower left corner of the bounding box) of the default symbol placed directly over the geographic location of the point. This means that the actual centre of the symbol will not be over the geographic co-ordinates as is often desired. As such it is often necessary to reposition point symbols so that the absolute centre of the point is over the actual geographic co-ordinates location.

To reposition a point symbol with the absolute centre of the symbol over the point's actual geographic location it is necessary to perform the following steps.

1. Open the Adobe Illustrator Character palette under Window ➔ Type.

2. Select the points you want to reposition and edit the font and font size as desired.

3. With the points still selected, click on "Show Options" in the Illustrator Character palette to expose the additional character options.

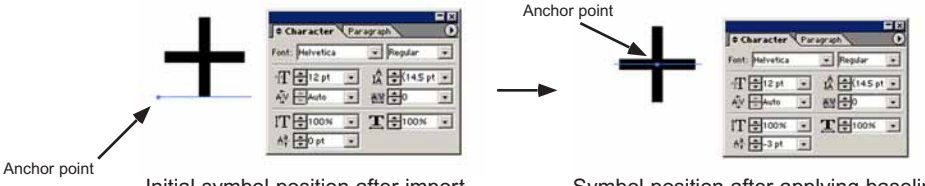
4. Enter a baseline shift of negative one-quarter of the font size for the selected points. For example, point symbols with a font size of 12 should have a baseline shift of -3.

Note: Dividing the font size by 4 in order to obtain the baseline shift value is a general rule of thumb which will apply to most TrueType fonts. When working with non-TrueType fonts and specialized symbol sets it may be necessary to experiment with various baseline shift values in order to find the one that is the most precise.

5. With the points still selected, click on the **Paragraph** tab of the Character palette and then click the **Align Center** button (second button from the left).

Note: This process must be redone whenever a change is made to a symbols font size.

Note: When creating point legends (see page 63), the baseline shift and paragraph centering functions may be applied to the legend elements before applying the legend settings. This will automatically place the new legend symbols for each point directly over the co-ordinates location.



Initial symbol position after import.

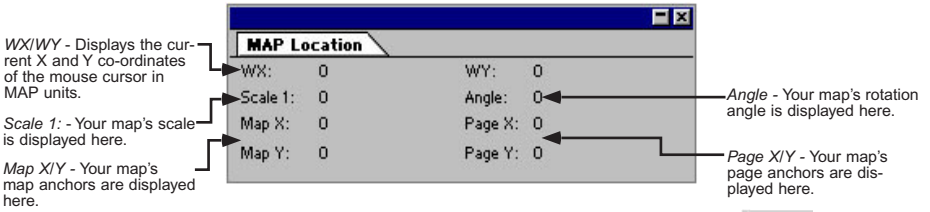
Symbol position after applying baseline shift and paragraph centering.

Note: MAPublisher does not apply rotation transformations to point symbols. It will however reposition the symbol's anchor point during a projection or scale transformation. In order to apply a rotation to point symbols use the Illustrator transform function (Object ➔ Transform ➔ Transform Each) and enter the designed rotation angle.

MAP LOCATION TOOL

The MAPublisher Location Tool displays the co-ordinates of the mouse cursor in map units. When no map units are present (ie. the layer has no geo-referencing information) the window will display the co-ordinates in page units. The window will also display the map and page anchors, the scale and the angle of rotation of the map.

Please familiarize yourself with the elements of the MAPublisher Location Tool dialog by reviewing the diagram below.



The MAPublisher Location Tool can be accessed by clicking on the Location icon in the Illustrator toolbar or by selecting Window ➔ MAPublisher Statistics ➔ Location.

Determining the Co-ordinates of a Specific Location

1. Import any map file from the tutorial_data folder on your MAPublisher CD.

2. Click on the MAP Location Tool button in the Adobe Illustrator toolbar or select Window ➔ MAPublisher Statistics ➔ Location.
   - The MAP Location Tool window appears.

3. Move the mouse cursor to the location whose geographic co-ordinates you wish to see.
   - The WX and WY fields will constantly be updated with the co-ordinates of the mouse cursor as you move the mouse around the map document.

Note: 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).

MAP ATTRIBUTES

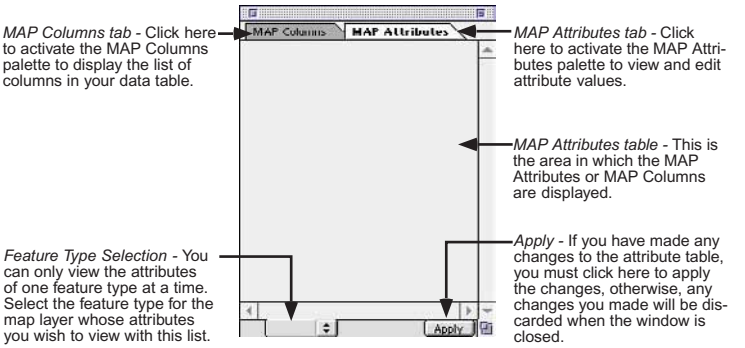
The attribute table that forms part of a GIS map file is one of the most important parts of any data set. It is in the attribute table that we find important information such as street names for lines, zoning or zip code numbers for areas and elevations for points to go along with our vector line, area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

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. MAPublisher also provides tools and dialogs for accessing, viewing, editing and adding to map attribute tables.

MAP ATTRIBUTES WINDOW

The MAP Attributes window lets you display the attribute records for your map layer or for selected parts of it. These attribute records are linked to the map's graphic elements. Only the attributes of selected map features will be displayed in the window at a given time. Also, only one type of feature from a single layer can be displayed at once (ie. you cannot view attributes for lines and areas at the same time).

The MAP Attributes window can be accessed by selecting Window ➔ MAPublisher Tables ➔ MAP Attributes.



MAP Attributes window with no items selected

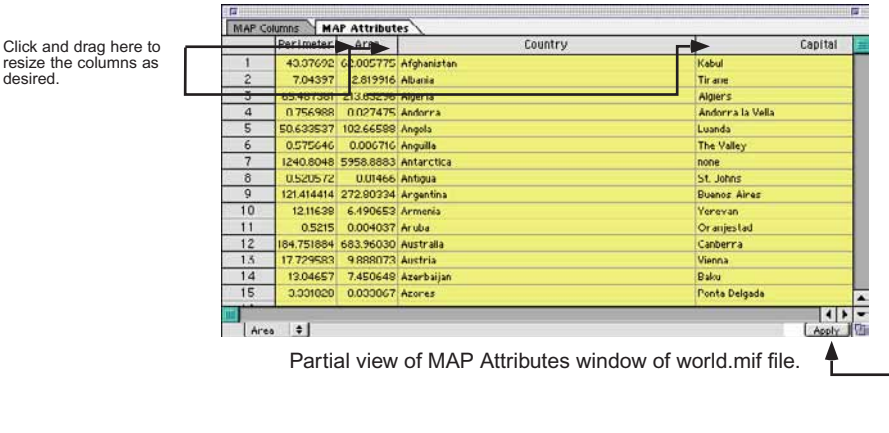
Note: The attribute values displayed in the MAP Attributes window may be sorted by column value by double-clicking on the column heading.

Viewing Map Attributes

1. Import the world.mif file from the tutorial_data folder on your MAPublisher CD (see Import Map, page 20).

2. Select all or some of the map's features.

3. Select Window ➔ MAPublisher Tables ➔ MAP Attributes.
   - The Map Attributes window appears.



Editing Map Attributes

MAPublisher's MAP Attributes window is a fully editable "spreadsheet-like" environment. All attribute values, except for those created by MAPublisher (Area, Perimeter, Length) can be edited by the user.

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 (ie. 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 MAP Attributes window you must click anywhere else in the MAP Attributes window BEFORE clicking the Apply button otherwise the edits may not be recorded.

Note: The widths of the columns in the MAP Attributes window may be changed by clicking on the column separator and dragging it left or right as desired.

MAP COLUMNS

The MAP Columns window allows you to view, edit, and create new map attribute columns.

Adding a New Column to a Map Attribute Table

1. Import the world.mif file from the tutorial_data folder on your MAPublisher CD.

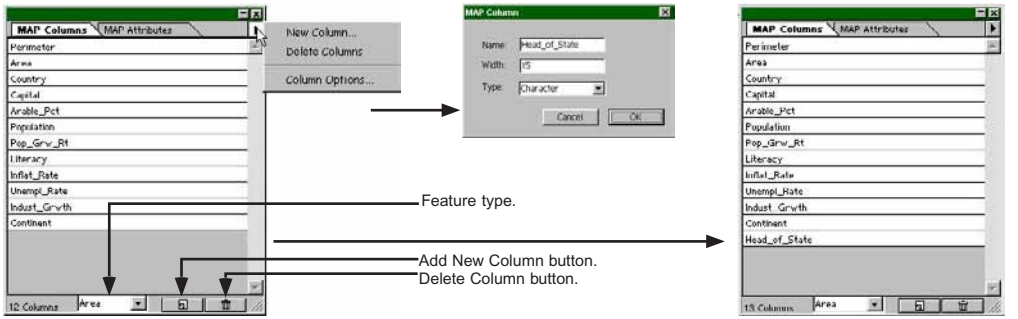
2. Select Window ➔ MAPublisher Tables ➔ MAP Columns.
   - The Map Columns window appears displaying the columns associated with your map attribute records.

3. Click on the **New Column** button or Option (▸) ➔ New Column.
   - The Map Column window appears.

4. Enter a column name, such as “Head_of_State”, as well as a type and a maximum width. In this case, Head_of_State, the type should be ‘character’.

Note: Column names cannot include spaces. Use the underscore (_) instead.

5. Click **OK**.
   - The new column is created and can be given values using the Map Attributes filter (see Map Attributes, page 35).



MAP Columns window before (left) and after adding the “Head_of_State” column.

Changing an Existing Column's Properties

1. Open the MAP Columns window and select the column name of the column whose properties you wish to edit. Select Option (▸) ➔ Column Options. To access the Option menu click on the small black triangle at the top of the vertical scrollbar.

2. Change the Name and Width fields as desired. You cannot change the column type once it has been created.

3. Click **OK**.
   - The column now has a new name and width.

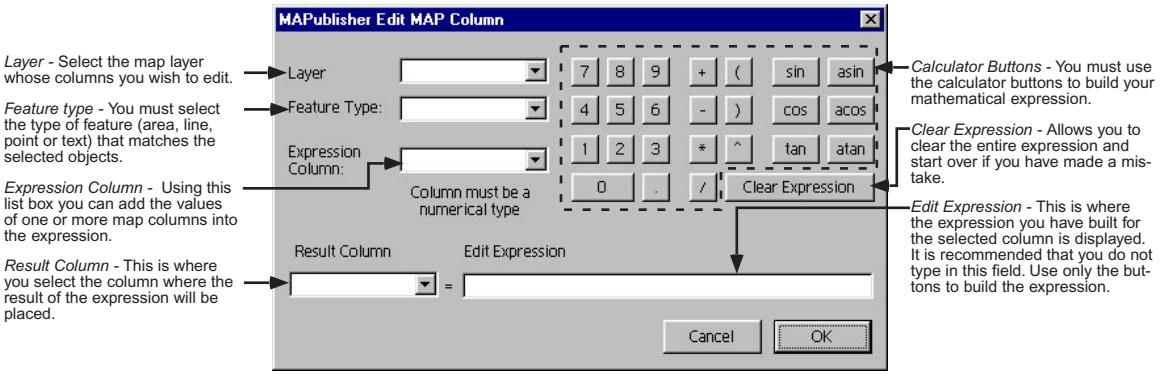
Removing a Column from a Map Attribute Table

To remove a column from a map attribute table simply select the column name and click on the remove icon (trash can symbol) at the bottom of the MAP Columns window. Columns may also be deleted by selecting Option (▸) ➔ Delete Columns. The second option may be used to delete multiple columns at one time.

EDIT MAP COLUMN

The MAPublisher Edit MAP Column 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 attribute data using this filter can be done by building an expression that accesses and manipulates values from other columns. Only numeric columns can be edited using this filter. The Edit MAP Columns filter is located at Filter ➔ 5. MAP Attributes ➔ Edit MAP Column.

Please familiarize yourself with the MAPublisher Edit MAP Column dialog by reviewing the following diagram.



Note: When using the Edit MAP Column filter to populate a new column with values based upon calculations using existing columns, the new column must be created before running the Edit MAP Column filter.

Note: The expression MUST be created using the buttons in the Edit MAP Column dialog and not your keyboard.

Editing the Values of a Map Column

1. Import the world.mif file from the tutorial_data folder on your MAPublisher CD.

2. Using the Map Columns filter, add a new column, “Annual_Increase”, to the world.mif attribute table. Make the width of the column 10 and set the type to Integer (see Map Columns, page 37).

3. Select the “world” layer from the Adobe Illustrator layers palette.

4. Select the countries for which you wish to calculate the annual population increase.

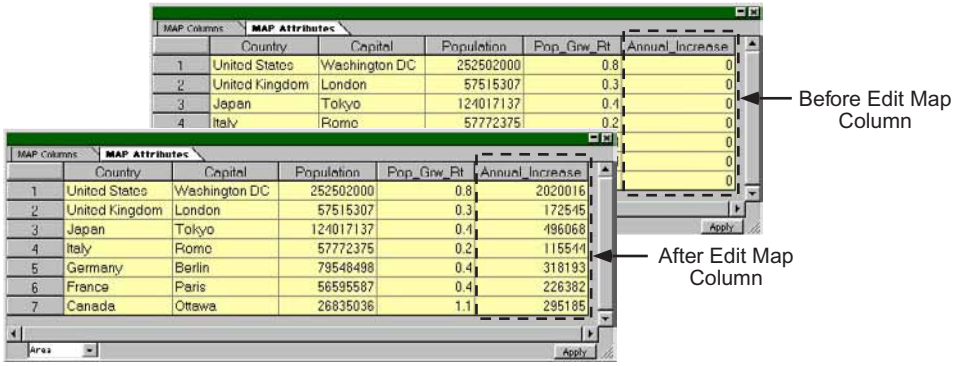
5. Select Filter ➔ 5. MAP Attributes ➔ Edit MAP Column.
   - *The Edit MAP Column window appears.*

6. Set the Layer to “world” and Feature Type to “Area”.

7. Select the Result Column to be updated/edited. In this case, use Annual_Increase.

8. Start building the expression using the calculator buttons and Expression Column list. Using the Expression Column dropdown list, select the Population column, Click the “*****” button and then the “**(**“ button. Using the Expression Column dropdown list again, select the Pop_Grw_Rt column. Click “*/*”, then enter 100 using the numeric buttons. Finally, click “**)**”.
   - *The expression in the Edit Expression box should now look like this:*
   *Population * (Pop_Grw_Rt / 100)*

9. Click **OK**.
   - *The selected features’ attributes will be updated. Use the Map Attributes window to view the changes (see Map Attributes Window, page 35).*



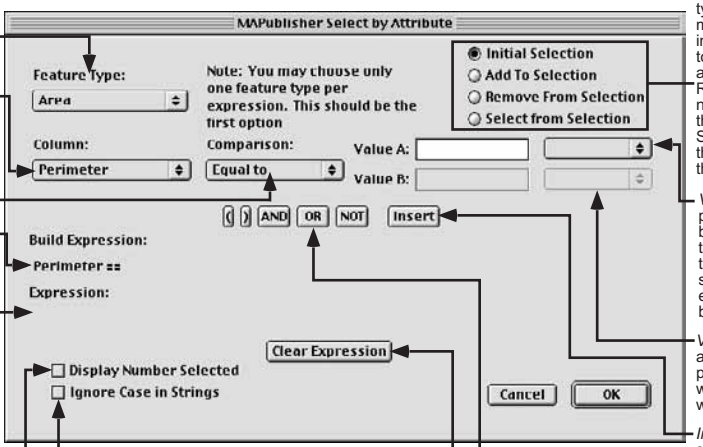
Your new column’s values should look something like those above. Of course they will vary depending on which countries you chose. Also, in the illustration above, a number of the attribute columns have been resized so that only 5 columns are visible.

SELECT BY ATTRIBUTE

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 kilometers long'. The kinds of queries you can make depends upon the attribute data associated with your map layer.

This filter has four options: Initial Selection, Add to Selection, Remove from Selection and Select from Selection. Initial Selection is intended to be used when nothing has been selected. 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 and Select from Selection will only query those features that have already been selected.

Please familiarize yourself with the MAPublisher Select by Attribute dialog by reviewing the following diagram.



Feature Type - Select the type of feature (line, area, point or text) that you will be selecting.

Column - Select the attribute column that you wish to base your query on.

Comparison - A list of comparison operators to help you build your expression - ie. Equal to, Greater than, Less than etc.

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

Expression - After clicking Insert, the Build Expression is moved into this box. This is the final expression that will be assigned to the selected elements when you press OK.

Display Number Selected - When this option is enabled, the SelStats window will be opened after the Select by Attribute 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).

Value A - There are two parts to this parameter - a text-box 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 text-box.

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.

Insert - Moves the build expression into the Expression box.

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.

Note: The MAPublisher Select by Attribute dialog will remember the feature type and column selections from the previous selection when performing additional selections on the same layer. It will not do so across multiple layers.

Making an Initial Selection

1. Import the burl_roads.lin file from the tutorial_data folder on your MAPublisher CD.

2. Select Filter ➔ 5. MAP Attributes ➔ Select by Attribute.
   - *The MAPublisher Select by Attribute window appears.*

3. Click the “Initial Selection” radio button.

4. Set the “Feature Type” dropdown list to “Line”.

5. Set the “Column” dropdown list to “code”.

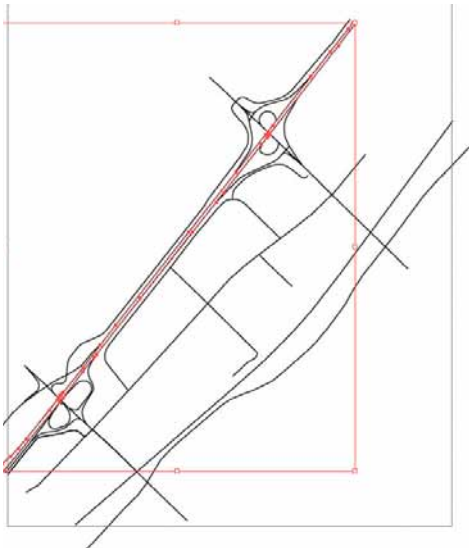
6. Set the “Comparison” dropdown list to “Equal to”.

7. Set the Value A to 2 from the drop down list near the entry field for “Value A:”. You can also type 2 into the entry field. Code 2 represents all roads that are classified as highways.

8. Click **Insert** to set the selection expression. If you realize you made an error after clicking Insert, just click on the **Clear Expression** button.
   - *The Build Expression is moved into the Expression box.*

9. Click the “Display Number Selected” check box to bring up the SelStats window if desired.

10. Click **OK**.
    - *The features that match the expression are selected and the MAPublisher Selection Statistics window appears (See “SelStats”, page 79).*



Result of Select by Attribute for lines with a code value equal to 2 in the burl_roads.lin file.

Adding to/Removing from/Selecting from an Existing Selection

1. Perform all the steps from the previous example and leave all resultant features selected.

2. Select Filter ➔ 5. MAP Attributes ➔ Select by Attribute.
   - *The MAPublisher Select by Attribute window appears.*

3. Click the “Add to Selection” radio button.

4. Set the “Feature Type” dropdown list to Line.

5. Set the “Column” dropdown list to code.

6. Set the “Comparison” dropdown list to Equal to.

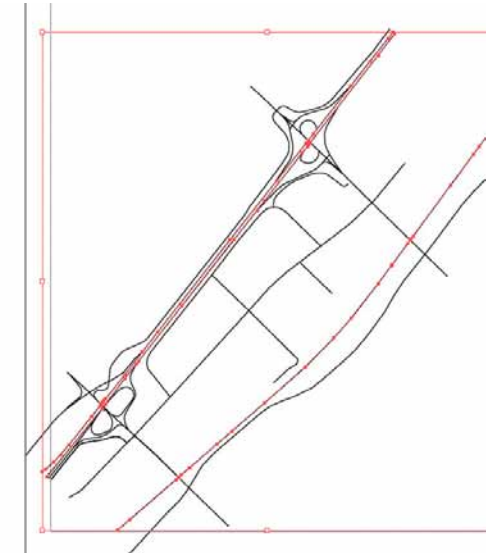
7. Set the Value A to 3 from the drop down list near the entry field for “Value A:”. You can also type 3 into the entry field. Lines with this code value are railways,

8. Click **Insert** to set the selection expression. If you realize you made an error after clicking Insert, just click on the **Clear Expression** button.
   - *The Build Expression is moved into the Expression box.*

9. Click the “Display Number Selected“ check box to bring up the Selection Statistics window if desired.

10. Click **OK**.
    - *The features that match the expression are selected and the MAPublisher Selection Statistics window appears (See ”SelStats”, page 79).*

Using the Remove from/Select from Selection options can be done the same way as Add to Selection.



Result of Select by Attribute for lines with a code value equal to 3 added to previous selection for lines with a code value equal to 2 in the burl_roads.lin file.

WORKING WITH IMAGES

MAPublisher 5.0 contains tools for working with geographic raster images such as aerial photographs and satellite imagery. This section describes the functions that MAPublisher provides for these purposes.

REGISTER IMAGE

The Register Image filter allows you to accurately position or register geo-referenced raster images with your vector map data. The geo-referencing information for such images is often stored in a separate text file that can be read by the MAPublisher Register Image filter.

Common geo-reference file types include:

- .irp - Image Report File
- .tfw/.jfw - TIFF/JPEG World File
- .tab - Table File
- .lgo - Listgeo File
- .tif - GeoTIFF File (contains both image and reference data)

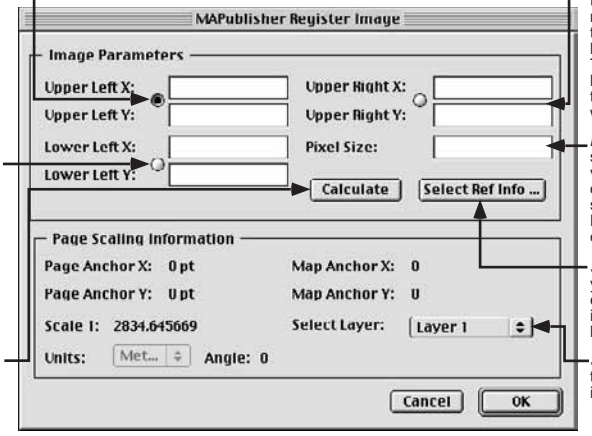
MAPublisher can read the geo-referencing information from GeoTIFF files which are files that contain both the geo-referencing data and actual image in a single file. Reading the data from such a file is done the same way as with an external referencing file except that the .tif file is used as both the image and the reference files.

Please familiarize yourself with the elements of the MAPublisher Register Image dialog by reviewing the diagram below.

Upper Left X/Y - The co-ordinates (in map units) of the upper left corner of the raster image. If the Upper Left X/Y radio button is selected this indicates that these are known values and must be entered in the corresponding fields. The values for the other 2 corners will be automatically calculated based on the entered values and the pixel size when the Calculate button is pressed.

Lower Left X/Y - The co-ordinates (in map units) of the lower left corner of the raster image. If the Lower Left X/Y radio button is selected this indicates that these are known values and must be entered in the corresponding fields. The values for the other 2 corners will be automatically calculated based on the entered values and the pixel size when the Calculate button is pressed.

Calculate - Automatically calculates the co-ordinates of the remaining (unknown) corners based upon the known input co-ordinates and the pixel size.



Upper Right X/Y - The co-ordinates (in map units) of the upper right corner of the raster image. If the Upper Right X/Y radio button is selected this indicates that these are known values and must be entered in the corresponding fields. The values for the other 2 corners will be automatically calculated based on the entered values and the pixel size when the Calculate button is pressed.

Pixel Size - The value for the pixel size should be specified by the image vendor. This is the relationship between one pixel in the image and its corresponding real world measurements. Pixel Size cannot be automatically calculated like the co-ordinates can.

Select Ref Info - This button will allow you to choose a file containing the reference information for the selected raster image. The information from the file will be inserted into the appropriate fields.

Select Layer - This allows you to select the layer that you wish to register the image to.

Note: When registering an image with MAPublisher it is important to remember that in order for an image to register correctly with a set of vector data, both the image and the vector data must be in the same geographic projection.

Registering an Image with a Reference File

1. Import the regional_south_china_sea.shp file from the tutorial_data folder on your MAPublisher CD.

2. Create a new Illustrator layer called “image” in the Layers palette.

3. Make sure the new “image” layer is highlighted in the Illustrator layers palette and select File ➔ Place.
   - *The Place File dialog box appears.*

4. Select the sample raster image file, borneo.tif, from the tutorial_data folder on your MAPublisher CD.

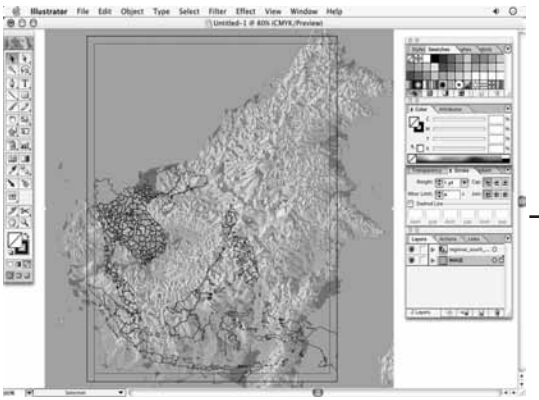
5. Click **Place** to bring the file into your Adobe Illustrator workspace.
   - *The raster image is brought in at a default position and scale in the centre of the screen.*

6. With the image selected, Select Filter ➔ 8. MAP Images ➔ Register Image.
   - *The Register Image dialog appears.*

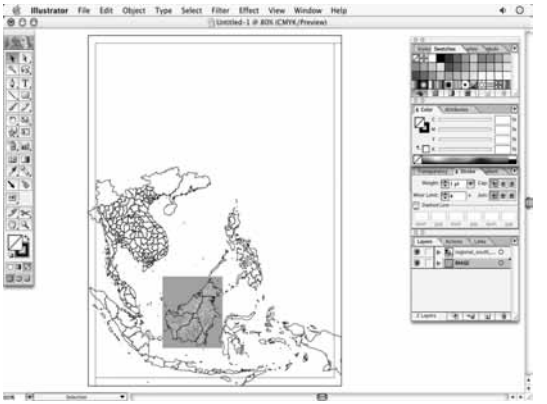
7. Use the “Select Layer” dropdown list to select the layer that the image will be registered to. In this case choose the layer called regional_south_china_sea.
   - *The Page Scaling information is updated to match the selected layer.*

8. Click on the **Select Reference Info** button and select the borneo.tfw file from the tutorial_data folder on your MAPublisher CD.
   - *The fields are all updated to reflect the data contained in the reference info file.*

9. Click **OK**.
   - *The image is registered to the selected layer.*



This is what your map should look like after the image has been placed but before it has been registered.



This is what your map should look like after the image has been registered.

Note: When working with GeoTIFF files remember to use the same file (ie. the .tif itself) in steps 4 and 8.

Registering an Image without a Reference File

1. Import the regional_south_china_sea.shp file from the tutorial_data folder on your MAPublisher CD.

2. Create a new layer called “image” in the Layers palette and add map parameters to that layer (see page 77).

3. Make sure the new “image” layer is highlighted in the Illustrator layers palette and select File ➔ Place.
   - The Place File dialog box appears.

4. Select the sample raster image file, borneo.tif, from the tutorial_data folder on your MAPublisher CD.

5. Click **Place** to bring the file into your Adobe Illustrator workspace.
   - The raster image is brought in at a default position and scale.

6. With the image selected, Select Filter ➔ 8. MAP Images ➔ Register Image.
   - The Register Image dialog appears.

7. Use the “Select Layer” dropdown list to select the regional_south_china_sea layer. This is the layer that the image will be registered to.

8. Click the radio button beside the map extent that you want MAPublisher to use as your image’s anchor point (Upper Left .X/Y, Lower Left X/Y or Upper Right X/Y).

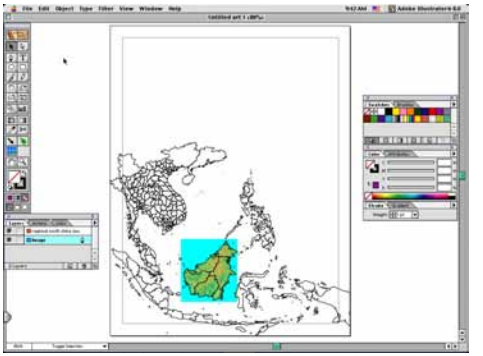
9. Enter the appropriate values into the selected textboxes, leaving the others empty. The registration values for the borneo.tif image are: Upper Left = (108.337561, 7.781662), Upper Right = (119.245702, 7.781662), Lower Left = (108.337561, -4.442099).

10. Enter 0.012773 for the Pixel Size.

11. Click the **Calculate** button to automatically calculate the two remaining co-ordinate values.
    -The anchor point and pixel size are used to calculate the values for the other co-ordinates.

12. Click **OK** to register the image.
    - The image is registered to the selected layer.

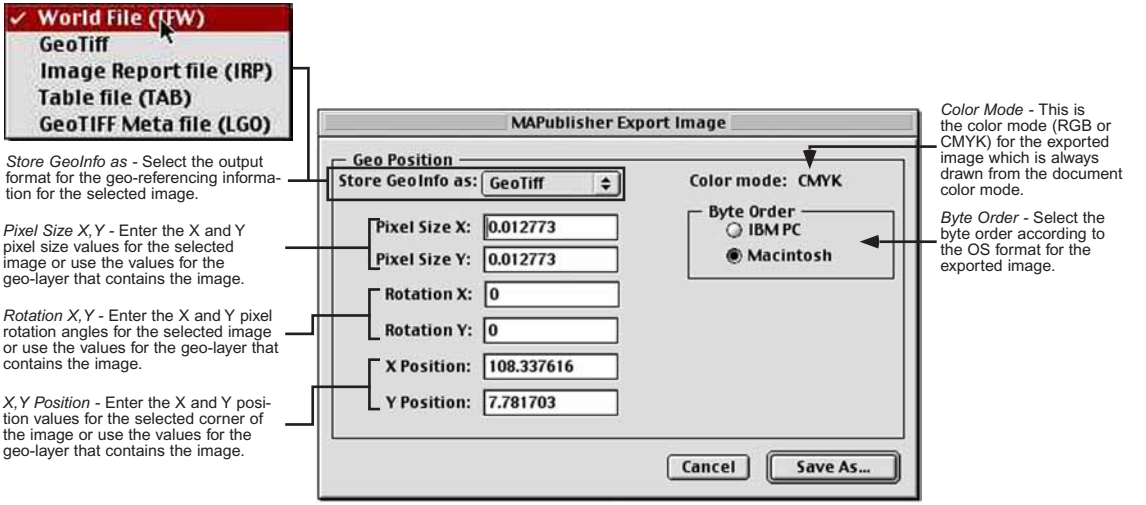
This is what your map should look like after the image has been placed but before it has been registered.



This is what your map should look like after the image has been registered.

EXPORT IMAGE

MAPublisher 5.0 offers the ability to export previously placed raster files as geo-referenced 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 file for which there is no geo-referencing file you can use the MAPublisher Export Image function to create a GeoTiff or other geo-referenced image file based upon the MAPublisher scale and co-ordinate system for vector data of the same area.



The MAPublisher Export Image Dialog

Note: Any image exported using the MAPublisher Export Image function will be created using the colour mode of the existing document, either RGB or CMYK. Please pay careful attention to this when exporting as some other software packages may not be able to open one colour mode or the other.

Note: The MAPublisher Export Image function only allows the export of previously placed image files. It will not directly convert vector layers into geo-referenced raster images. To turn vector mapwork into a geo-raster file see page 48.

Exporting a Placed Image as a Geo-Referenced Raster File

1. Import the italy.mif file from the tutorial_data folder on your MAPublisher CD.

2. Apply a fill of “none” to the data and change the stroke colour to red with a line weight of 0.25 pt.

3. Create a new Illustrator layer called “image” and add Map Parameters to that layer by following the steps on page 77 using the “same as” option and referencing the “italy” layer.

4. Move the “image” layer below the “italy” layer in the layers hierarchy.

5. Select the “image” layer in the Illustrator layers palette and select File ➔ Place to open the Illustrator Place dialog.

6. Browse to the sicily.tif file in the tutorial_data folder of your MAPublisher CD and click **Place**.
   - The image of the Italian island of Sicily appears on the 'image' layer of your document.

7. Manually drag the image of Sicily until it fits inside the box around the vector outline of Sicily on the "italy" layer.

Note: The box around the vector outline of Sicily is meant to be a guide for the purpose of this example only. It is not a normal part of the vector layer. If you do not have the parameters required to position the image using the Register Image filter it will be necessary to manually position the image until the correct location is achieved. In most cases it will also be necessary to scale the image to fit the vector layer. When scaling an image it is imperative that the X:Y proportions be maintained in order to preserve the integrity of the exported copy.

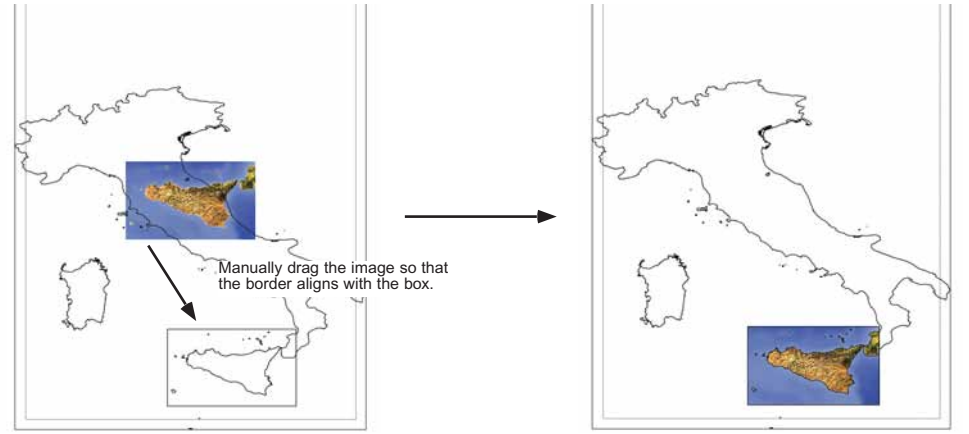
8. Set the colour mode in which you wish to export the image. MAPublisher will export the image in the colour mode of the document, RGB or CMYK. If a change is necessary it can be done using the Illustrator File ➔ Color Mode menu.

9. With the image selected, select Filter ➔ 8. MAP Images ➔ Export Image.
   - The MAPublisher Export Image dialog appears.

10. Select the desired geo-referencing output format from the "Store GeoInfo as" dropdown menu. For this example we used "GeoTiff". Leave the "Byte Order" at the default value.

Note: It is advisable to leave the Export Image settings at the default values when exporting. Exporting as GeoTiff will result in the creation of a single .tif file containing both the image and the geo-referencing data. Other GeoInfo formats create separate image and geo-referencing files. See page 43 for more details.

11. Click **Save as** to name the exported image and complete the operation.
    - The image of Sicily has been exported as a GeoTiff file using the geo-parameters of the "image" layer. This image can be used in other GIS applications or in other Illustrator documents using MAPublisher.



Position of placed image before moving to the correct position.

Correct position of placed image for execution of Export Image function.

Converting an Illustrator Vector Layout to a Geo-Image

The MAPublisher Export Image filter can be used to easily create a geo-referenced raster image such as a geotiff or .tif with .tfw from any Illustrator map document. In simple terms the procedure involves first exporting your document to a .tif or other raster file format using the native Illustrator export options and then placing and re-exporting your image using the steps in the previous section.

1. Complete the Illustrator map document you wish to use to create the geo-image

2. In your Illustrator document, make all the layers visible that you wish to be present in your raster image and turn off any unwanted layers.

3. Select File ➔ Export and choose the desired raster export format (.tif, .gif, .jpg etc.) as well as a filename and destination directory. If appropriate enter additional raster options you desire, such as resolution and compression settings.

4. Click **OK** to export your map as a standard, non-geo-referenced raster image.

5. While your original vector document is still open, create a new layer called “image”.

6. With the “image” layer selected, go to Map Creation ➔ Add Map Parameters, and choose a geo-referenced layer from the “or same as” dropdown list.
   - This will be the geo-referencing used during the creation of the geo-image.

7. With the “image” layer selected in the layers palette, go to File ➔ Place and select the image you exported in steps 3 and 4 and click **Place**.
   - The image will be placed at a default position on the “image” layer.

8. Manually reposition the image so that it is coincident with your vector linework as in step 7 of the previous section.

9. Set the colour mode in which you wish to export the image. MAPublisher will export the image in the colour mode of the document, RGB or CMYK. If a change is necessary it can be done using the Illustrator File ➔ Color Mode menu.

10. With the image selected, select Filter ➔ 8. MAP Images ➔ Export Image.
    - The MAPublisher Export Image dialog appears.

11. Select the desired geo-referencing output format from the “Store GeoInfo as” dropdown menu. Leave the “Byte Order” at the default value.

12. Click **Save as** to name the exported image and complete the operation.
    - The visible vector artwork has now been exported as a geo-referenced raster image suitable for use in other geographic software. You can check alignment by using the MAPublisher Register Image filter.

PROJECTIONS & TRANSFORMATIONS

PROJECTION EDITOR

Map projections are a way of visually presenting the world globe on a flat surface. There are literally hundreds of projections in use today all of which are based upon complex mathematical formulae that convert the spatial relationships between points on the globe to points on a flat page. The MAPublisher Projection Editor filter lets you easily convert maps from one projection to another using simple dialogs and menus. MAPublisher currently supports over 120 projections.

Three parameters are common to all geographic projections. These are the Central Meridian and the Cartesian offsets for the respective X and Y axis (False Easting and Northing). The Central Meridian is a simple translation of the longitude axis which is normally used to center a projection at a particular longitude. A fourth parameter, latitude, is used to designate a central parallel and associated Y axis for some projections. Unless you specify a value for any of these parameters, MAPublisher will assume a value of "0".

When specifying a Central Meridian or parallel use the following syntax. To specify 45 degrees, 25 minutes, 30 seconds North, use 45d25'30"N. If the latitude value is in the Southern hemisphere then either -45d25'15.22" or 45d25'15.22"S are acceptable. West longitude and South latitude are expressed as negative values. For example: 120W = -120 = 120d0'0"W and
50S = -50 = 50d0'0"S

Before proceeding to the examples on the following pages please familiarize yourself with the MAPublisher Projection Editor dialog.

Input/Output Parameters - You must specify whether you are entering the input or output projection values for your map. If you are projecting your map and it is already in a projection, you must enter the specifications of the current projection before setting the new output parameters.

Projection - The list from which you select the desired projection.

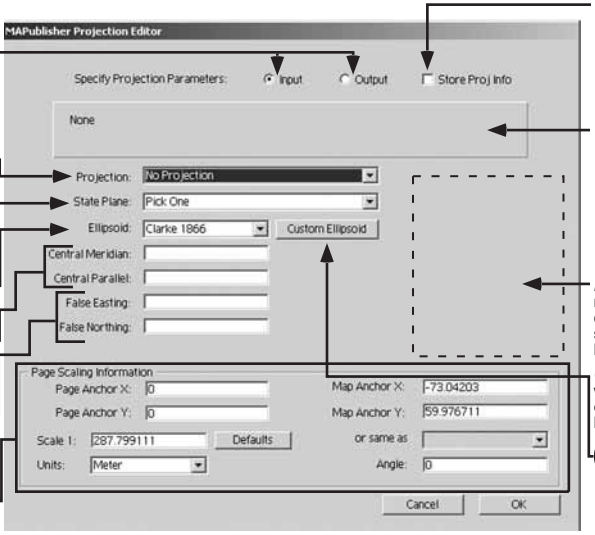
State Plane - Auto-loads projection settings for specific US states. The projection is either Lambert Conformal Conic or Transverse Mercator (depending on the state).

Ellipsoid - You can select from a variety of pre-defined ellipsoids using this list.

Central Meridian/*Central Parallel* - These values specify the co-ordinates around which your projection will be centered.

False Easting/*False Northing* - Allows you to modify the cartesian X/Y offsets of your data, shifting it either east (False Easting) or north (False Northing).

Page Scaling Information - The controls in this area function the same way as they do in other dialogs.



The MAPublisher Projection Editor window

Store Proj Info - Check this box to indicate that the projection values are for an imported file that has already been projected and you want to make the projection info recognizable by MAPublisher WITHOUT actually performing a projection transformation.

Projection Info Display - This is where the existing projection information is displayed. If the layer you are working with has already been projected the name of the existing projection will be shown here. Also, if you imported a mid/mif, .e00 or SDTS file that contains projection information, the file's projection will be displayed here.

Extra Input Fields - Some projections require additional information to function correctly. When certain projections are selected, supplementary input fields will be displayed in this area.

Custom Ellipsoid - Brings up another window where you can specify parameters for a custom ellipsoid. (See image below)

The Custom Ellipsoid window

Tip: Not all projections are valid for all areas of the globe so make sure that the projection you wish to output is appropriate for the area of the world you are working with.

Projecting an Unprojected Map (ex. Lat/Long to UTM)

1. Import the fsatoronto.mif file from the tutorial_data folder on your MAPublisher CD.

2. Select the “fsatoronto” layer and select Filter ➔ 2. MAP Scale ➔ Projection Editor.
   -The MAPublisher Projection Editor window appears.

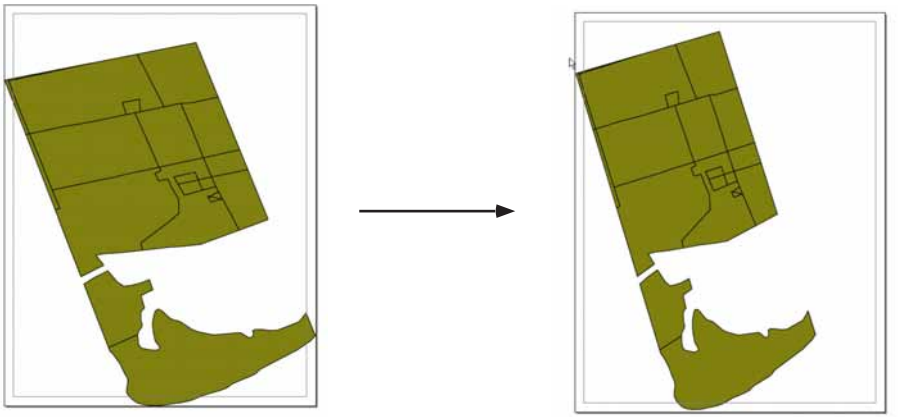
3. Click the “Output” radio button. Input parameters are not required in this case because the map is initially in latitude/longitude (ie. unprojected or no projection).

4. Set the “Projection” dropdown list to Universal Transverse Mercator (UTM).
   - The MAPublisher Projection Editor Window now displays additional input boxes reflecting the requirement of additional input data for the UTM projection.

5. fsatoronto.mif is a postal zones map of Toronto. Toronto falls in UTM zone 17 so choose 17 from the UTM Zone selection list. (See Appendix 2 for the UTM zones map). As Toronto is not in the southern hemisphere, the “Southern Hemisphere” check box should be left unchecked.
   - The Central Meridian is automatically updated.

6. Click **Defaults** in the Page Scaling Information section to calculate a new scale for the map in this projection and round the scale to 35000. (It is not necessary to round the scale but in many cases it is more desirable to work with rounded scale values)
   - The Map Anchors and Scale are updated.

7. Click **OK**.
   - The map layer you have just projected is redrawn UTM.



Unprojected (lat/long) display of fsatoronto layer.

fsatoronto layer after projecting into UTM.

Tip: The same projection transformation can be applied to additional map layers by selecting the desired layer in the Illustrator layers palette and choosing Filter ➔ Apply Projection Editor.

Changing a Map's Projection (ex. Robinson to Albers Equal Area)

1. Import the states.mif file from the tutorial_data folder on your MAPublisher CD.

2. Select the states layer and select Filter ➔ 2. MAP Scale ➔ Projection Editor.
   - *The MAPublisher Projection editor dialog appears.*

3. Check the top section of the Projection Editor dialog. If the current projection is recognized by MAPublisher it will be displayed there and you can skip to step 7. If the current projection is not recognized by MAPublisher you must first enter it as the input projection by continuing to step 4.

4. Click the "Input Parameters" radio button.

5. As the states.mif file is known to be already in Robinson projection set the "Projection" dropdown list to Robinson to identify the existing projection of the file.

6. Set the "Central Meridian" to 96W or 96d0'0"W or -96, to represent 96 degrees west longitude.

7. Click the "Output Parameters" radio button.

8. Set the "Projection" dropdown list to Albers Equal Area.
   - *The MAPublisher Projection Editor Window now displays additional input boxes reflecting the requirement of additional input data for the Albers Equal Area projection.*

9. Set the "Central Meridian" to 96W or 96d0'0"W or -96. "Central Parallel" to 37d30'0"N, "1st Latitude" to 29d30'0"N and "2nd latitude" to 45d30'0"N.

10. In the Page Scaling Information section click **Defaults**.
    - *You will see the Map anchors and the Scale values update.*

11. Round off the scale and set the page anchors as desired.

12. Click **OK**.
    - *The projection of your map will change to Albers Equal Area.*

states layer in Robinson Projection.

states layer after projecting to Albers Equal Area.

Storing a Map's Projection

In many cases map data may have already been projected prior to being imported into Illustrator with MAPublisher. In some of these cases MAPublisher will recognize the projection on import of the file but in other cases it may not, such as shapefiles (shp) which do not natively store projection data unless accompanied by a .prj file. In instances where MAPublisher does not recognize the existing projection of an imported file it may be desirable to be able to tell MAPublisher what projection a layer is in. In order to use some of MAPublisher's functions, such as Point Plot, it is mandatory that the existing projection be recognized by MAPublisher. In other cases you may simply want to embed the projection information into the Illustrator file as a record should you want to reuse an existing map file at a later date and may need to project it.

New in MAPublisher 5.0 is the ability to enter projection information for an existing Illustrator layer, without actually performing a projection operation, so that the layer's projection is henceforth recognized by MAPublisher.

Note: In order to correctly and accurately use the Store Projection function you must be aware of ALL the projection parameters of your map file including the map units used in the creation of the data file. If you are unsure of the parameters of your file check with your data provider as incomplete and incorrect entries can damage the geo-integrity of your map.

Using the MAPublisher Projection Editor to Store a Map's Projection

1. Import the canada.shp file from the tutorial_data folder on your MAPublisher CD.

2. Select the "canada" layer and select Filter ➔ 2. MAP Scale ➔ Projection Editor.
   - The MAPublisher Projection Editor dialog appears. Notice that the area at the top of the dialog does not display any recognized projection information for this layer.

3. Click the "Store Proj Info" radio button.
   - The "Store Proj Info" button will only be available when the existing projection is unknown.

4. As the canada.shp file is known to be in Albers Equal Area projection set the "Projection" dropdown list to "Albers Equal Area". In this case the ellipsoid is the default Albers Equal Area ellipsoid, Clarke 1866, so leave the "Ellipsoid" dropdown at "Clarke 1866".

5. Set the "Central Meridian" to 96W or 96d0'0"W or -96 to represent 96 degrees west longitude and set the "Central Parallel" to 60N or 60d0'0"N or 60 to represent 60 degrees north latitude.

6. Set the "First Latitude" and "Second Latitude" to values representing 42 degrees north latitude and 80 degrees north latitude, respectively.

7. Check all the entered values carefully and click **OK** to embed the projection information.
   - The projection of the canada layer is now set at Albers Equal Area and will be recognized by all appropriate MAPublisher functions.

Tip: Once a projection has been incorrectly stored the only way to correct it is to perform an actual projection from the incorrect one to the correct one.

8. Re-open the MAPublisher Projection Editor and notice that the Albers Equal Area projection is now recognized and appears at the top of the dialog with the appropriate values displayed in the "Input" section.

Copying a Projection From One Layer to Another

In some cases you may have a projected map layer in Illustrator, wherein the projection is recognized by MAPublisher, and you want to copy the projection parameters of that layer to another Illustrator layer.

In order to achieve exact duplication of projection parameters between layers, the MAPublisher Projection Editor provides a “or same as” function which allows a layer to have projection information assigned to it by referencing an already projected layer.

1. Open the USA.ai file from the tutorial_data folder on your MAPublisher 5.0 CD.
   - The single layer, “USA”, in this file is already in Albers Equal Area projection.

2. Create a new Illustrator layer and rename it “cities”.
   - At this point, the “cities” layer is a basic Illustrator layer without any geographic parameters or projection details.

3. Add MAP Parameters to the cities layer by following the steps on page 77 using the “same as” option and referencing the “USA” layer.
   - The scaling information from the “USA” layer has now been applied to the “cities” layer.

4. Select the “cities” layer and open the MAPublisher Projection Editor (Filter ➔ 2. MAP Scale ➔ Projection Editor).

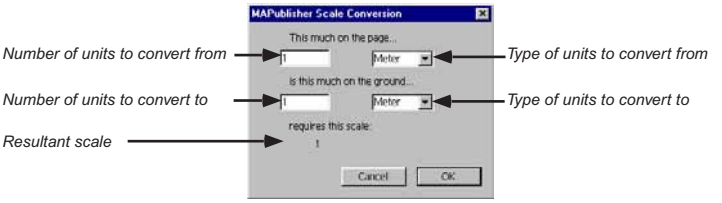
5. Apply the “USA” layer’s projection to the “cities” layer by clicking the “Output” radio button and selecting the “USA” layer from the “or same as” dropdown list.
   - The Albers Equal Area projection information from the “USA” layer has been successfully applied to the new “cities” layer.

Tip: Projection parameters can be applied to subsequent layers in immediate succession by selecting Filter ➔ Apply Projection Editor.

Note: In order to copy a projection from an existing layer to a layer that already has projection information assigned to it you must enter the existing projection input projection between steps 4 and 5 (see Changing a Map’s Projection, page 51).

SCALE CONVERSION

The Scale Conversion filter is a scale conversion calculator, that allows you to perform conversion calculations to use with other MAPublisher filters and dialogs.



Calculating a Scale

1. Select Filter ➔ 2. MAP Scale ➔ Scale Conversion
   - *The Scale Conversion window appears.*

2. Enter the number of units and unit types to be used in the conversion.
   - *The scale conversion is calculated.*

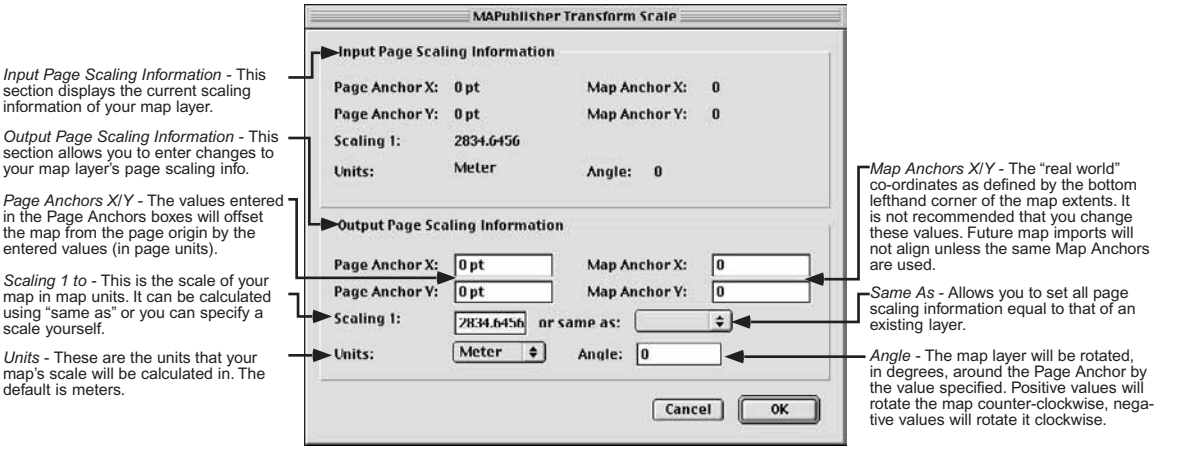
MAPublisher Scale Conversion filter in use.

The above example shows how to calculate a scale of 1:1000 in order work between meters and kilometers.

TRANSFORM SCALE

The Transform Scale filter allows a map's page anchors, map anchors, scale, map units or rotation angle to be changed while accurately maintaining the cartographic grid of the workspace. The Transform Scale filter can also be used to change the scaling parameters of a layer to match those of an existing layer. The MAPublisher Transform Scale filter can be accessed by selecting Filter ➔ 2. MAP Scale ➔ Transform Scale.

Please familiarize yourself with the layout of the Transform Scale dialog by reviewing the following diagram.



Tip: If you are ever unsure about the scaling parameters of a particular map layer you can always query it by selecting the layer and opening the Transform Scale window. The current parameters will be shown in the Input Page Scaling Information section.

Note: The angle of rotation is absolute. For example, rotating a map with a 10 degree rotation by 15 degrees will result in a 15 degree rotation not a combined 25 degree rotation.

Note: When the "or same as" option is used to copy scaling information from one layer to another the MAPublisher Transform Scale filter will not copy projection information. Only page scaling parameters (scale, units, angle and anchors) are copied between layers using this filter. To copy projection information between layers see Copying a Projection From One Layer to Another, page 53.

Note: MAPublisher does not apply rotation transformations to point symbols. It will however reposition the symbol's anchor point during a projection or scale transformation. In order to apply a rotation to point symbols use the Illustrator transform function (Object ➔ Transform ➔ Transform Each) and enter the designed rotation angle.

Transforming a Map's Scale

1. Import the eastUS.shp file from the tutorial_data folder on your MAPublisher CD.

2. Select Filter ➔ 2. MAP Scale ➔ Transform Scale.
   - The MAPublisher Transform Scale window appears. Note that the present scale as calculated on import is 1:9,220,957.019015, which is not desirable as it does not allow room for the map legend. We will therefore transform the scale and move the map anchors to accommodate the legend

4. Enter "50 pt" in the "Page Anchor X" text box, "100 pt" in the "Page Anchor Y" text box and "11000000" in the "Scale" text box. This will move the page anchors to the right and up by 50 points and 100 points, respectively, while changing the scale to 1:11,000,000 in order to make the map fit better on the page.

5. Click **OK**.
   - The map's scale is changed and it is offset by the specified amount from the page origin.

Before and after views of the scale transformation of the EastUS map layer.

MAP LEGENDS

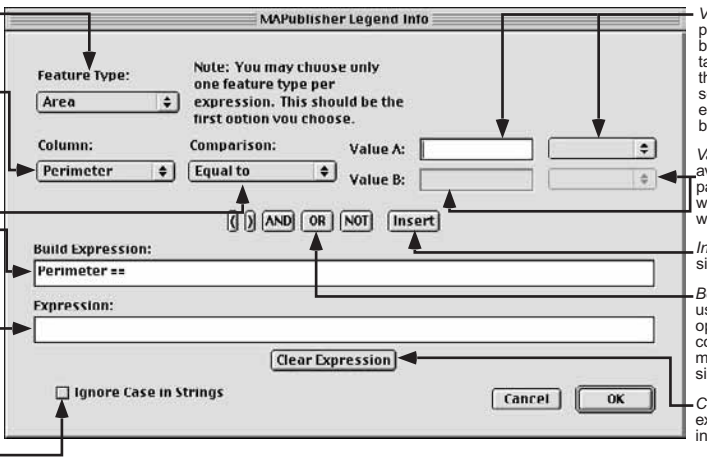
MAPublisher 5.0 includes tools for quickly, easily and accurately creating point, line and area legends from your map data. The MAPublisher legend filters are able to read and work with the data found in the map attribute tables and to apply strokes, fills and fonts to map elements according to user specified legend criteria.

MAPublisher 5.0 provides two methods for assigning values to your map legend. The manual method is discussed under Assign Legend Info and the automatic method is discussed under Auto Assign Legend Info.

ASSIGN LEGEND INFO

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 manually assigns the legend criteria to legend elements. Legend elements are drawn using Adobe Illustrator's drawing tools (circles/rectangles etc. for area features, lines for line features, text fonts for point features). Please refer to your Adobe Illustrator User Guide for additional information about the drawing tools. All legend elements must be made MAPublisher-aware before they can be used in creating a legend. This means that they are recognized by MAPublisher as map elements rather than just Illustrator artwork. This may be accomplished using the Map Creation filters (see Assign Area/Line/Point/Text Defaults on page 78 for more information on these filters).

Please familiarize yourself with the layout of the Assign Legend Info dialog by reviewing the diagram below.



Feature Type - Select the type of feature (line, area, point or text) for which you want to create a legend.

Column - Select the attribute column that you wish to base your legend on.

Comparison - A list of comparison operators to help you build your expression - ie. Equal to, Greater than, Less than etc.

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

Expression - After clicking Insert, the Build Expression is moved into this box. This is the final expression that will be assigned to the selected legend element when you press OK.

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

Value A - There are two parts to this parameter - a text-box 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 text-box.

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.

Insert - Moves the build expression into the Expression box.

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.

The Assign Legend Info dialog functions similarly to the Select by Attribute dialog.

Building a Legend Using Assign Legend Info

1. Import the income.mif file from the tutorial_data folder on your MAPublisher CD.

2. Draw three rectangles with the rectangle tool from the Adobe Illustrator tools palette. These rectangles will represent the area colours for the different criteria in the map legend.

3. Define the fill and the stroke for each rectangle as desired using Adobe Illustrator's colour tools.

4. Select the three legend rectangles at the same time using the global select or the shift and select method.

5. Select Filter ➔ 4. MAP Creation ➔ Assign Area Defaults.
   - The legend rectangles are converted to MAPublisher objects. The Assign Area Defaults filter functions invisibly when executed. As such you will not see any visible change to your document or workspace after this step. In this step of the procedure the three rectangles are invisibly converted from basic Illustrator graphics to intelligent MAPublisher areas and assigned a default set of area attributes.

6. Select the first rectangle.

7. Select Filter ➔ 3. MAP Legend ➔ Assign Legend Info.
   - The MAPublisher Assign Legend Info dialog box appears.

8. Set the "Feature Type" dropdown list to Area, the "Column" dropdown list to Total_Households, "Comparison" dropdown list to Less Than and enter 1000 in the "Value A:" text field.
   - This will enter a value Total_Households<1000 in the build expression area of the dialog.

9. Click **Insert** to set the Expression.
   - The "Build Expression" will be placed into the "Expression" box.

10. Click **OK**.
    - The selected rectangle is assigned a legend value of Total_Households<1000 and is associated with corresponding map features that have values in that range.

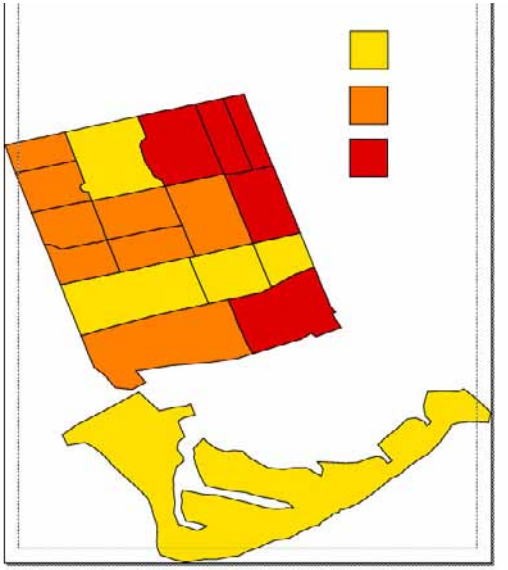
11. Repeat steps 7 to 10 for the second rectangle but set the "Comparison" dropdown list to Between: >= a and <= b and enter 1000 in the "Value A:" field and 2000 in the "Value B:" field.

12. Repeat steps 7 to 10 for the third rectangle but set the "Comparison" dropdown list to Greater than and enter 2000 in the "Value A:" field.

    At this point, legend values have been assigned to all three of your legend rectangles although no visible change to your map can be seen yet.

13. Select all the legend rectangles.

14. Select Filter ➔ 3. MAP Legend ➔ Draw Legend Layer.
    - The map is updated so that the map elements reflect the legend symbols.



Results of legend creation using Assign Legend.

Tip: Legend boxes can be quickly and easily labeled with their expressions by simply clicking on them using the MAP Tagger tool. See the section on Labeling - MAP Tagger Tool, page 69 for more information on using the MAP Tagger tool.

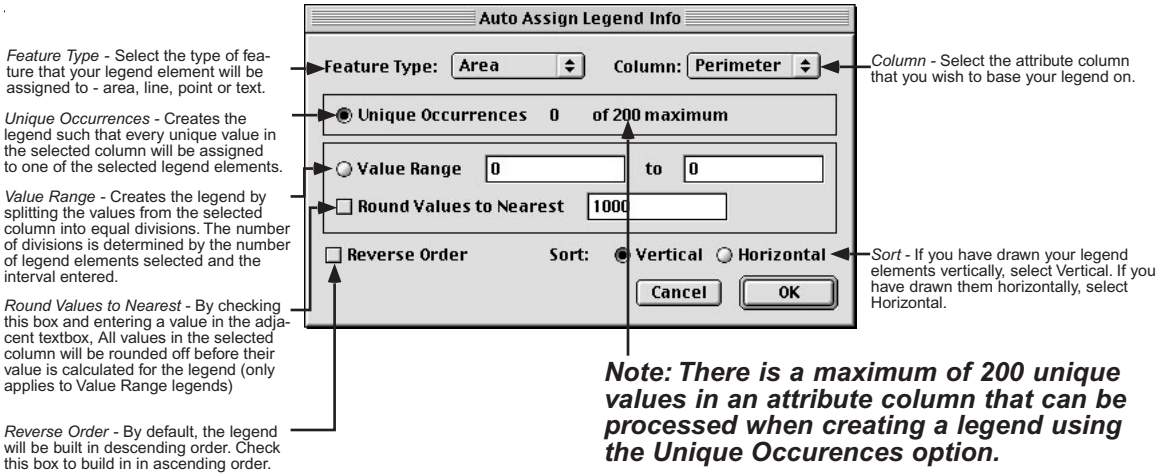
AUTO ASSIGN LEGEND INFO

The Auto Assign Legend Info filter allows you to automatically create a custom legend for your map based on its attribute information. It works similarly to the Assign Legend Info filter but does not require you to specify a criteria or expression for each legend element. Instead it automatically determines the best way to divide your data according to the number of legend elements you wish to use. The Draw Legend Layer filter must still be run after the legend information has been assigned.

There are two options available for auto assigning legends: Unique Occurrences and Value Range. With Unique Occurrences, every unique value in the selected column will be assigned to one 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 alpha-numeric type attributes (ie. Road Class = A41 or Zoning = Park).

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 (ie. Population = 12,000,432 or Area = 6,666).

Please familiarize yourself with the layout of the Auto Assign Legend dialog by reviewing the following diagram.



Building a Legend Using Auto Assign Legend Info - Unique Occurrences

This option for legend creation is most often used with text attributes.

1. Import the burl_roads.lin file from the tutorial_data folder on your MAPublisher CD.
2. Draw three lines with the pen tool from the Illustrator tools palette. These lines will represent the line colours for the different values in the map legend.
3. Define the colour and stroke for each line.
4. Select the three legend lines.
5. Select Filter ➔ 4. MAP Creation ➔ Assign Line Defaults.
   - The legend lines are converted to MAPublisher objects. The Assign Line Defaults filter functions invisibly when executed. No visible changes to your document or workspace will be seen after this step. In this step of the procedure the three lines are invisibly converted from basic Illustrator graphics to intelligent MAPublisher lines and assigned a default set of line attributes.
6. Select Filter ➔ 3. MAP Legend ➔ Auto Assign Legend Info.
   - The Auto Assign Legend Info window appears.
7. Set the “Feature Type” dropdown list to “Line”
8. Set the “Column” dropdown list to “Code” to create a legend based on the three different line types in this file.

9. Click the “Unique Occurrences” radio button.

10. If your lines are ordered horizontally, click the “Sort: Horizontal” radio button. If they are ordered vertically, click the “Sort: Vertical” radio button.

11. Click **OK**.
    - *The selected lines are assigned legend values and are associated with the corresponding map features.*

12. Select the newly created legend lines and then select Filter ➔ 3. MAP Legend ➔ Draw Legend Layer.
    - *The map is updated so that the map elements match the legend symbols.*

Results of line legend creation using Auto Assign Legend Info (Unique Occurrences).

Tip: You may determine the values that have been assigned to each legend element using the Unique Occurrences method by using the MAP Tagger tool and clicking on each legend element. See the section on Labeling - MAP Tagger Tool, page 69 for more information on using the MAP Tagger tool.

Building a Legend Using Auto Assign Legend Info - Value Range

This option should be used with numeric attributes.

1. Import the income.mif file from the tutorial_data folder on your MAPublisher CD.

2. Draw three rectangles with the pen tool from the Illustrator tools palette. These rectangles will represent the area colours for the different criteria in the map legend.

3. Define the fill and stroke for each rectangle.

4. Select the three rectangle legend elements.

5. Select Filter ➔ 4. MAP Creation ➔ Assign Area Defaults.
   - The legend areas are converted to MAPublisher objects. The Assign Area Defaults filter functions invisibly when executed. As such you will not see any visible change to your document or workspace after this step. In this step of the procedure the three areas are invisibly converted from basic Illustrator graphics to intelligent MAPublisher areas and assigned a default set of area attributes.

6. Select Filter ➔ 3. MAP Legend ➔ Auto Assign Legend Info.
   - The Auto Assign Legend Info window appears.

7. Set the “Feature Type” dropdown list to “Area”

8. Set the “Column” dropdown list to “family_average_income” to create a legend based on the average income of the families in each region of the map.

9. Click the “Value Range” radio button and leave the range at the default settings.

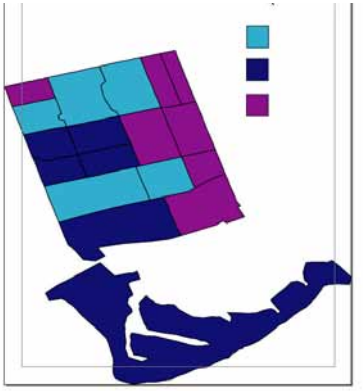
11. If you laid out your areas horizontally, click the “Sort: Horizontal” radio button. If you laid them out vertically, click the “Sort: Vertical” radio button.

12. Click **OK**.
    - The selected rectangles are assigned legend values and are associated with corresponding map features.

13. Select Filter ➔ 3. MAP Legend ➔ Draw Legend Layer.
    - The map is updated so that the map elements match the legend symbols.

Tip: You may determine the values that have been assigned to each legend element using the Value Range method by using the MAP Tagger tool and clicking on each legend rectangle. See the section on Labeling - MAP Tagger Tool, page 53 for more information on using the MAP Tagger tool.

Tip: 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.



Results of area legend creation using Auto Assign Legend Info (Value Range).

POINT LEGENDS

MAPublisher imports point data as text when using either the Import MAP or Import Points filters. The default font and font size used to display imported points immediately after import is whichever font and size are currently selected when the import operation is performed. The default symbol used is the plus sign (+). Although the symbol can be changed prior to import when using the Import Points filter or Point Plotter, it is not possible when importing a GIS point file using the Import MAP filter. The symbols (fonts) particular to any set of points can be changed using the MAPublisher legend filters and the various text fonts that may be present on your system.

Note: The text anchor, not the centre of the symbol, is placed over the geographic co-ordinate of the point. Adjustments can be made using the steps for Repositioning Point Symbols on page 33.

Changing Point Symbols (Creating a Point Legend)

1. Import the hypoint.e00 file from the tutorial_data folder on your MAPublisher CD.

2. Using the Adobe Illustrator Type Tool, create four text objects on the page to use as your new symbols. For example, #, @, $ and X.

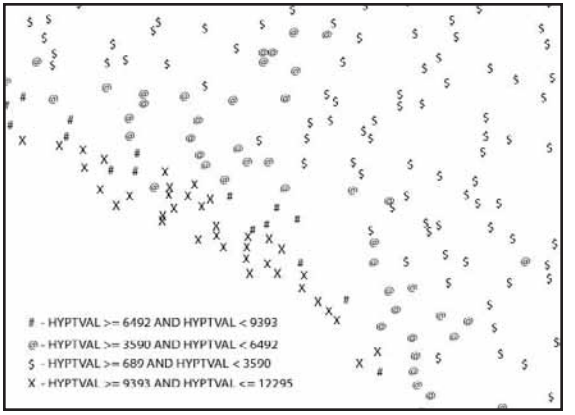
3. Select the objects and select Filter ➔ 4. MAP Creation ➔ Assign Point Defaults.
   - *The selected text objects are now MAPublisher point objects.*

4. Keep the objects selected and select Filter ➔ 3. MAP Legend ➔ Auto Assign Legend Info.
   - *The MAPublisher Auto Assign Legend Info window appears.*

5. Set the “Feature Type” dropdown list to Point, the “Column” dropdown list to HYPTVAL (the elevation of the point) and click the “Value Range” radio button.

6. If you arranged the text objects vertically, click the “Sort: Vertical” radio button, If you arranged them horizontally, click the “Sort: Horizontal” radio button and then Click **OK.**

7. Select Filter ➔ 3. MAP Legend ➔ Draw Legend Layer.
   - *The text representing the points (“+”) will be replaced with the corresponding text from the point legend text objects.*



This is an example of a point legend created using four legend elements representing a range of land elevations for southwestern Alberta.

LEGEND MATCHING FEATURES

This filter may be used to quickly select all features of a map corresponding to a particular legend element.

Selecting Features Based on Legend Attributes

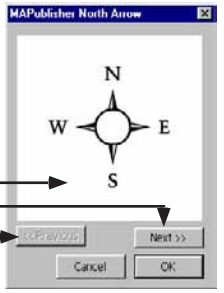
1. Create a map with a legend (see Assign Legend Info on page 57 or Auto Assign Legend Info on page 59).

2. Select one or more legend elements.

3. Select Filter ➔ 3. MAP Legend ➔ Legend Matching Features.
   - *The map features associated with the selected legend elements are selected.*

NORTH ARROW

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. The North Arrow dialog can be accessed by selecting Filter ➔ 3. MAP Legend ➔ North Arrow.



North Arrow Display - The selected north arrow is displayed here.

Previous/*Next* - Cycle through the various available north arrow styles.

MAPublisher North Arrow dialog window.

Note: The north arrow will be placed on the currently selected layer. The selected layer must be unlocked. If you want the north arrow on its own layer you must create the layer and add map parameters to it before running the North Arrow filter.

Adding a North Arrow

1. Import any map file from the tutorial_data folder on your MAPublisher CD.

2. Select Filter ➔ 3. MAP Legend ➔ North Arrow.
   - *The MAPublisher North Arrows window appears.*

3. Click the **Next** and **Previous** buttons to cycle through the various designs and choose one.

4. Click the **OK** button.
   - *The north arrow appears, rotated according to the map's parameters.*

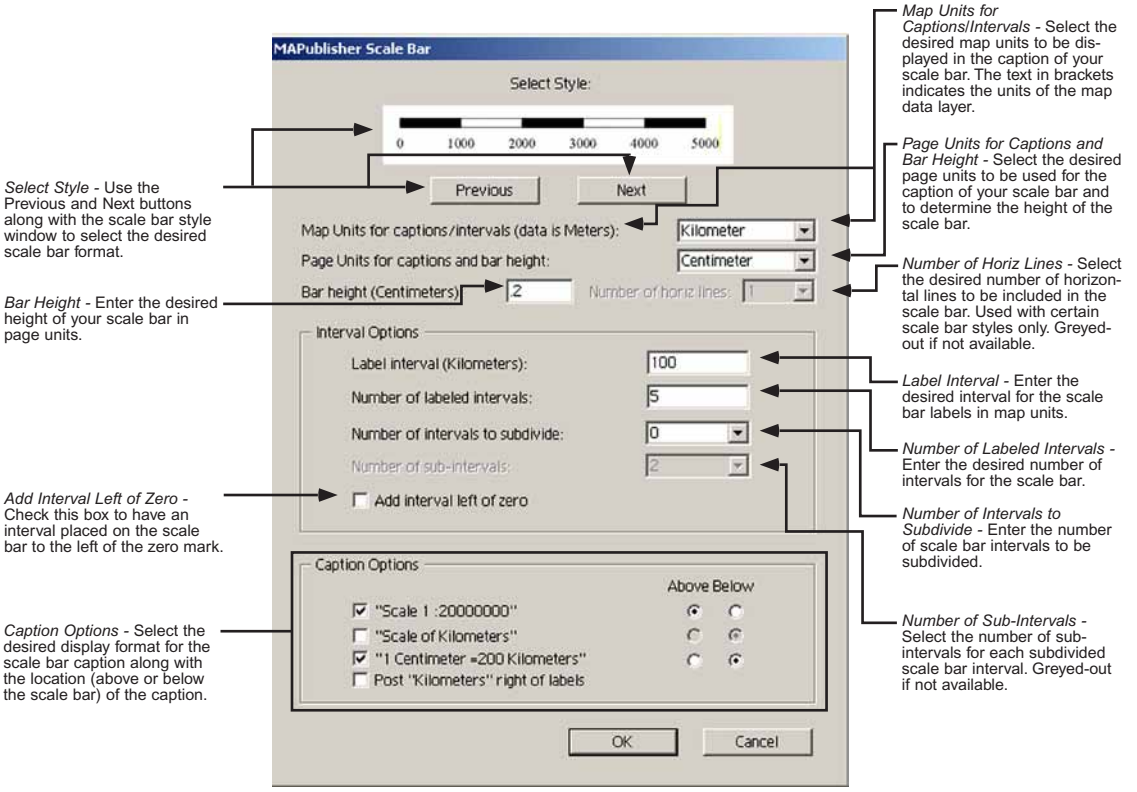
5. Position, resize and colour the north arrow as desired.

Note: A north arrow will NOT be rotated or projected when a scale or projection transformation is performed. You must reapply the north arrow when either or both of the Transform Scale and Projection Editor have been used on a layer that contains an already placed north arrow.

SCALE BAR

MAPublisher 5.0 includes a dedicated map scale bar creation tool. This tool automatically generates a scale bar for your map according to a series of preferences selected in the MAPublisher Scale Bar dialog. The MAPublisher Scale Bar dialog can be accessed by selecting Filter ➔ 3. MAP Legend ➔ Scale Bar.

Please familiarize yourself with the MAPublisher Scale Bar dialog by reviewing the diagram below. After completing the example on the following page we encourage you to experiment with the various combinations of settings in order to become familiar with the many types of scale bars one can create with MAPublisher.



The MAPublisher Scale Bar Dialog

Note: The MAPublisher Scale Bar filter can only be used on a projected map layer. Layers that are in lat/long must be projected before the MAPublisher Scale Bar filter can be used. See Projections & Transformations, page 49, for detailed instructions on projecting your Illustrator map layers.

Creating a Scale Bar

1. Open the USA.ai file from the tutorial_data folder on your MAPublisher 5.0 CD.

2. Create a new Illustrator layer and rename it “scale bar”.

3. Add MAP Parameters to the scale bar layer by following the steps on page 77, using the “same as” option and referencing the USA layer.

4. Set your desired font and font size using the Illustrator Type menu or Character palette. For this example we used an 8 pt font.

5. Open the MAPublisher Scale Bar filter by selecting Filter ➔ 3. MAP Legend ➔ Scale Bar.

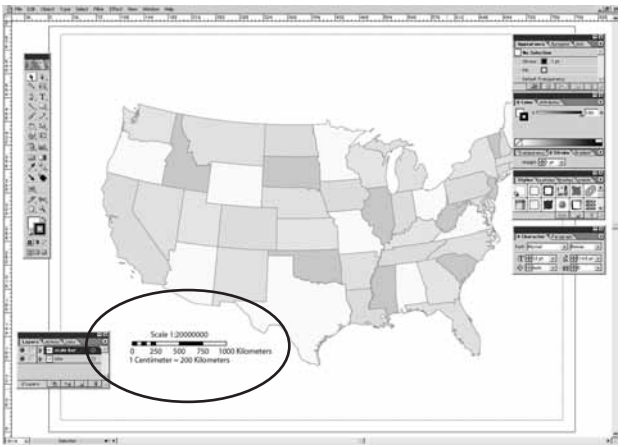
6. Choose a desired scale bar style using the **Previous** and **Next** buttons. For this example we used the first style as per the diagram on the preceding page.

7. Set the Map Units dropdown list to Kilometer, the Page Units dropdown list to centimeter and the Bar Height to 0.2 cm.
   - These settings will create a scale bar that equates centimeters on the page to kilometers on the map and that is 0.2 cm high.

8. Set the Label Interval to 250 kilometers, the Number of Labeled Intervals to 4, the Number of Intervals to Subdivide to 1 and the Number of Sub-intervals to 5.
   - These settings will create a scale bar that represents a total distance of 1000 km, has 4 main cells each representing 250 km and where the first cell is further divided into 5 smaller cells.

9. Set the Caption Options by clicking the ‘Scale 1:20000000’ checkbox and the ‘Above’ radio button, the ‘1 Centimeter = 200 Kilometers’ checkbox and the ‘Below’ radio button, and the ‘Post kilometers right of labels’ checkbox.
   - These settings will create a scale bar with the labels placed accordingly.

10. Click **OK** to create the scale bar.
    - The scale bar will be placed on the page according to the settings defined in the previous steps.



Completed USA map with scale bar

LABELING

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.

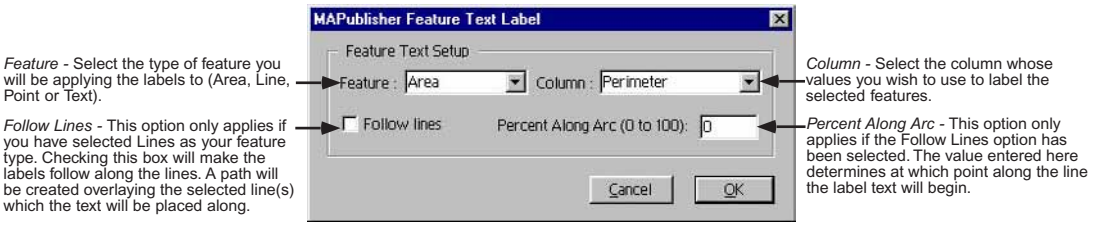
MAPublisher provides two methods of adding labels to your map, both of which are very simple to use. One way to create feature labels is to first select all the features you want labeled and use the Feature Text Label filter to label all of them by a specified attribute value. An alternate method involves using the Map Tagger tool to apply labels individually. Both these methods are discussed in the following sections.

FEATURE TEXT LABEL

The Feature Text Label filter allows labels to be added to your map based on the attribute data of the feature (line, point or area) being labeled. Simply select the features that you want to label and then run the Feature Text Label filter. Select the feature type that applies to your map (Area, Line, Point or Text) and the attribute column that you want the labels to be drawn from.

If you are labeling Line features, you can choose to have the labels follow along the lines by selecting the “Follow Lines” option. The labels can then be dragged and positioned at any position along a line. A specific value for the label’s position can be entered in the “Percent Along Arc” box.

Please familiarize yourself with the Feature Text Label dialog by examining the diagram below.



The MAPublisher Feature Text Label dialog.

Note: Labels applied using Feature Text Label will always appear initially in black stroke with no fill in the currently selected font and font size. The stroke, fill, font and size can be changed at any time thereafter using Adobe Illustrator’s tools.

Note: If Follow lines is not selected and the feature type has been set to lines, the labels will appear horizontal to the page at the mid-point of the line.

Adding Labels to a Map Using Feature Text Label

1. Import the torontostreets_joined.mif file from the tutorial_data folder on your MAPublisher CD.

2. Select a font and text size for the labels you want to create.

3. Select the features you wish to label. In this example simply select one or more of the streets that were just imported.

4. Select Filter ➔ 3. MAP Legend ➔ Feature Text Label.
   - *The MAPublisher Feature Text window appears.*

5. Set the “Feature” dropdown list to the type of feature you are going to label - Area, Line, Point or Text. In this case choose “Line”.

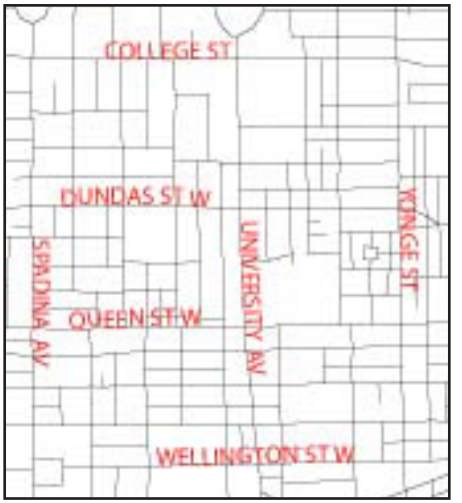
6. Set the “Column” dropdown list to whichever column you wish to draw the labels from. For this example, choose “Street”. This column contains the name of every street on the map.

7. Click the “Follow Lines” check box to make the street names align with the lines that they apply to.

8. Set the “Percent Along Arc” value to “40” so that the label text starts near the middle of the line.

9. Click **OK**.
   - *The labels appear for the selected map features.*

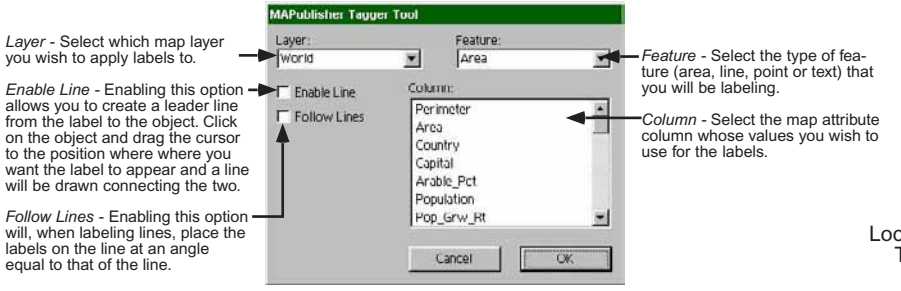
10. If necessary, adjust the text length and position by dragging on the end point handles so that the entire label is displayed and/or moved to a desired location along the line.



This image displays several lines that have been labeled using Feature Text Label

MAP TAGGER TOOL

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 click on the symbol in the tools palette to select it. 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. 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 dialog

Adding Labels to a Map Using the MAP Tagger Tool

1. Import the fsatoronto.mif file from the tutorial_data folder on your MAPublisher CD.

2. Double-click on the MAP Tagger tool in the Adobe Illustrator Tools palette.
   - *The MAP Tagger Tool dialog appears.*

3. Set the Layer to that of the file you just imported, the Feature to Area, and the Column to FSA.

4. Click on the “Enable Line” checkbox. When this is option is enabled a leader line may be created by clicking on a feature and drag the cursor to where you want the text to appear. A leader line will be created joining the feature with the text.

5. Click **OK**.

6. Click on any feature you wish to label. Try the “Enable Line” feature as well.

Note: 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.

Tip: The MAP Tagger Tool may also be used to label or query legend elements. 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.

GRIDS & INDEXES

This version of MAPublisher contains tools for easily creating map grids and map indexes. 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

The MAPublisher Grid Generator is the principal filter used for creating a grid for your map. It is also the first step in creating a map index as the Make Index filter operates based on grid cells created using this filter. To access the MAPublisher Grid Generator filter select Filter ➔ 3. MAP Legend ➔ Grid Generator.

There are several different options for making grids with the MAPublisher Grid Generator and it is therefore very important to become familiar with the various parameters of the filter's operation and the Grid Generator dialog itself. Each grid has the following parameters:

- lower left X/Y co-ordinates.
- upper Right X/Y co-ordinates.
- number of columns and rows of the grid.
- size of each grid cell (X by Y).
- units that the grid cell sizes are to be based on.
- what the grid is made with (lines or rectangles).
- number of vertices to be used in the creation of grid lines.

The MAPublisher Grid Generator also contains options to generate index labels for your map. The "Generate Index Labels" checkbox must be checked in order for your grid to be used by the Make Index filter. Grid labels can only be placed on a grid made with rectangles – the option will be unavailable if Lines is selected. The Make Index filter and the steps for creating an index are covered in detail later in this section on pages 74-76.

Please familiarize yourself with the Grid Generator dialog by reviewing the following diagram.

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

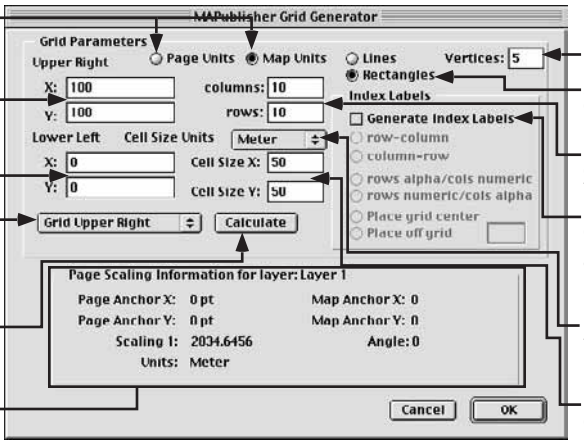
Upper Right X/*Y* - These are the X and Y values for the upper right extent of the grid.

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

Calculate Parameter - This list contains three items: Grid Upper Right, Grid Cell Numbers and Grid Cell Size. The value selected is the value that will be calculated when the Calculate button is clicked.

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

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



Verticies - When your grid is created using lines, this value will determine how many verticies will be used to create each line.

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

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

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.

Cell Size Units - If you have chosen to base your grid on Map Units, you must select the type of unit (ie. meter, kilometer etc) to use.

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

Creating Grids

For the purpose of explaining the use of the MAPublisher Grid Generator two distinct examples are provided in the following sections. These are only two of the many possible configurations for creating grids using the Grid Generator. MAPublisher allows grids to be created in page units or map units. Use page units when you want to specify the grid corners and cell sizes in page units (ie. a corner at 8",11.5" with a cell size of 1 in^2). Use map units when you want to specify the grid corners and cell sizes in map units (ie. a corner at 180°,90° with a cell size of 100 km^2). We encourage the experimentation with other configurations in order to better understand how the filter operates.

Generating a Grid - Ex. 1 (Map Units; Auto Calculate Grid Cell Numbers)

1. Import the world.mif file from the tutorial_data folder on your MAPublisher CD.

2. Create a new blank layer for the grid you are about to create.

3. Using the Add Map Parameters filter, assign geo-referencing information to the new layer (See Add Map Parameters, page 77). The referencing information should match that of the map, so use the "or same as" option and select the layer that has the world.mif file on it.
   - Geo-referencing information is invisibly added to the blank layer.

4. Define the visual parameters for the grid by setting the colour fill to "none" and choosing a stroke colour and line weight.

5. Using the MAP Location Tool, record the co-ordinates of the point where you want the upper right of your grid to be (See MAP Location Tool, page 34). The location should be (180,90).

6. Make sure that the layer you want to place the grid on is selected and unlocked and select Filter ➔ 3. MAP Legend ➔ Grid Generator.
   - The MAPublisher Grid Generator dialog box appears.

7. Leave the "Units" type at the default of "Map Units", "Lines/Rectangles" at the default of "rectangles" and increase the "Vertices" to 10.
   - If you plan to reproject your map later you may need to enter a higher number of vertices in order to achieve curved grid lines after the reprojection. (See Projection Editor, page 49) You can also add vertices later by using Object ➔ Path ➔ Add Anchor Points.

8. Place the values you recorded in step 5 into the "Upper Right X/Y:" text boxes. Notice that the "Lower Left X/Y:" co-ordinates are already set to the lower left extent of your map.

9. Leave the "Cell Size" units at the default of "meters".
   *- Select alternative units from this dropdown **only** if your data is projected and you want to calculate cell sizes with real-world sizes. If your data is in lat/long, as in this example, leaving this dropdown at the default value will enable you to plot cells with distances in degrees.*

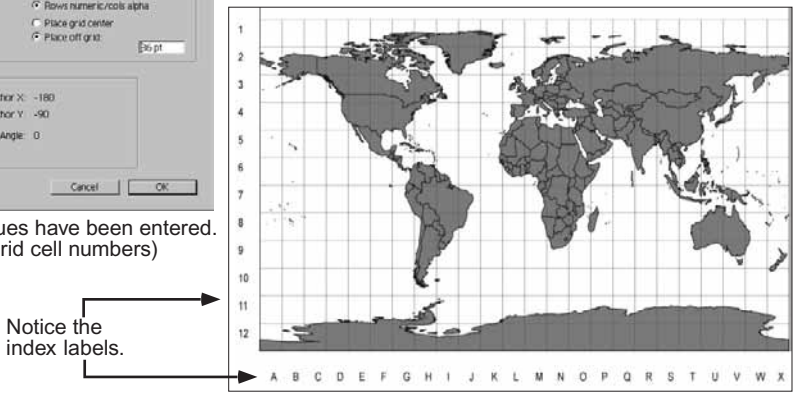
10. Enter 15 for each of the "Cell Size X" and "Cell Size Y" values.
    - As the data is unprojected these values are in degrees and will result in a grid that has lines placed at 15° intervals.

11. Using the dropdown list, select "Grid Cell Numbers" and then click **Calculate**.
    - The number of grid cells is calculated based on the other parameters.

12. Click on the “Generate Index Labels” checkbox and click the “Place off grid” radio button.
    - The “Generate Index Labels” options are enabled. If this step is optional however if it is performed, index labels will appear along the X and Y axis of your map. The “Place off grid” button locates the labels outside the grid. For more on indexing see page 74.

13. Click **OK** to process the grid generation based on the entered parameters.
    - A grid is placed on the map based on your specifications. The grid lines are placed at 15 degree intervals and each cell carries an alpha-numeric identifier.

Grid Generator dialog after all values have been entered.
(map units, auto calculate grid cell numbers)



The world.mif file after creating a rectangle grid
(index option selected).

Generating a Grid – Ex. 2 (Page Units; Auto Calculate Grid Upper Right)

1. Import the world.mif file from the tutorial_data folder on your MAPublisher CD.

2. Create a new blank layer for the grid you are about to create.

3. Make sure that the layer you are placing the grid on is selected and unlocked and select Filter ➔ 3. MAP Legend ➔ Grid Generator.
   - The MAPublisher Grid Generator dialog box appears. Note that as this grid is being based on page units it is not necessary to run the Add Map Parameters filter on the grid layer before proceeding.

4. Click the “Page Units” radio button.
   - The grid will now be based on page units. The “Cell Size Units” dropdown list is disabled.

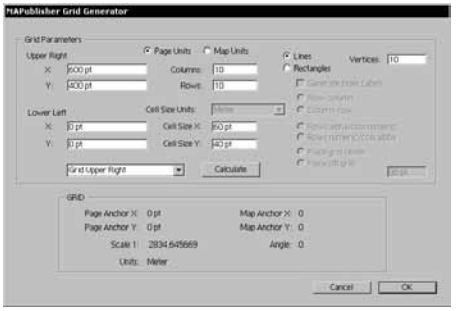
5. Enter 10 for the number of grid rows and 10 for the number of grid columns in the “columns” and “rows” text boxes.

6. Enter 60 for the width and 40 for the height of each grid cell in the “Cell Size X/Y:” text boxes.
   - This will create cells that are 60 pts wide & 40 pts high and assumes that your page is set up with points as the page units.

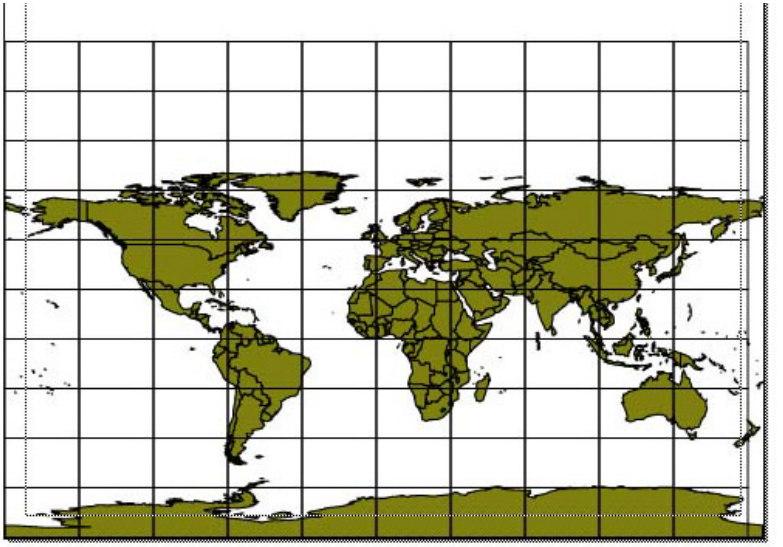
7. Using the dropdown list, select “Grid Upper Right” and then click **Calculate**.
   - The grid’s upper right extent is calculated based on the other parameters.

8. Click the “Lines” radio button and enter 10 in the “Vertices” text box.

9. Click **OK**.
   - The Grid Generator dialog box closes and a grid is placed on the map.



Grid Generator dialog after all values have been entered
(page units, auto calculate grid upper right)



The world.mif file after creating a line grid using page units and
auto calculate grid upper right.

MAKE INDEX

The MAPublisher 5.0 Grid Generator filter contains an option to generate an index for your map. In order to facilitate the creation of a map index using this filter you must check the “Generate Index Labels” option before creating your grid. Doing so allows the grid structure to be used by the MAPublisher Make Index filter.

Several options are available for the index labels that will appear along the frame or in the cells of your grid. Grid cells may be referenced by row then column, or by column then row. As well, the columns can be set to be labeled numerically and rows alphabetically, or vice versa. Finally, there is an option to have the labels placed within each grid cell or simply have each row and column labeled outside of the grid. It is also possible to specify how far from the grid you want external labels to be placed.

Grid labels can only be placed on a grid made with rectangles. The index option will be unavailable if “Lines” is selected.

The MAPublisher Make Index filter allows an index to be created based on either a map’s text labels or its features.

Text label based indexing works by referencing the grid cells where each of the labels are found. For example, if the label “Toronto” was found in the grid cell “B-5” the entry in the index text file would appear as follows:

```
Toronto  B-5
```

Any other labels would appear in the file the same way.

Feature based indexing will produce a much larger index because instead of just referencing the grid cells where the labels have been placed, every grid cell that the feature being labeled passes through is referenced. For example, if the label “Toronto” was labeling an area, every cell that contained a part of that area would be referenced and entries in the index text file might appear as follows:

```
Toronto  A-4
Toronto  A-5
Toronto  B-4
Toronto  B-5
Toronto  B-6
```

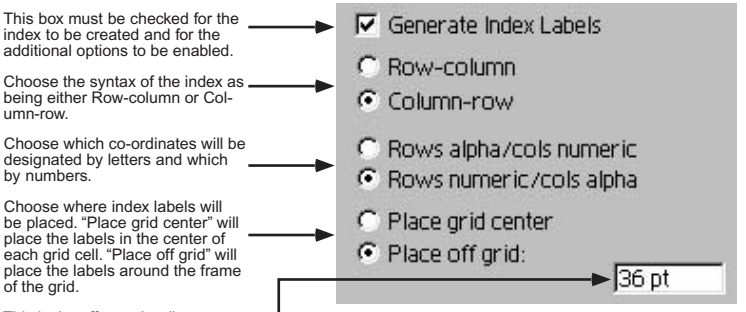
Any other labels on the map would have their associated feature referenced in the same way.

The index must be based on an existing grid layer so that the text or map features can be referenced. After running the Make Index filter a text file is generated to store the index. This file can then be placed in an Adobe Illustrator text box on your map.

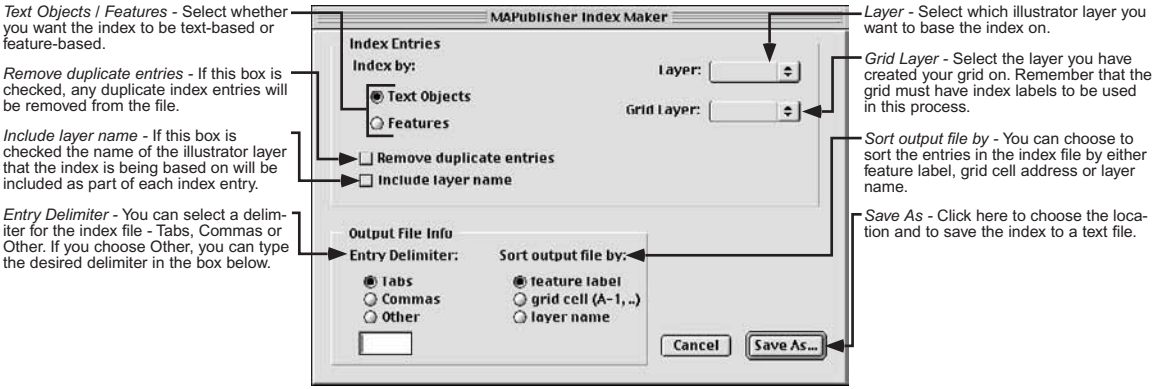
Note: In order to create an index using either of these options, your map must be labeled using either of MAPublisher’s labeling tools or by adding text defaults to text that you entered using Illustrator’s type tools (see Assign Text Defaults, page 78). Normal Adobe Illustrator text and unlabeled features will not be indexed.

Note: When using the Make Index filter the map grid must be on a separate layer from all other map data.

Please familiarize yourself with the elements of the MAPublisher index functions by reviewing the diagrams below.



Section of Grid Generator dialog containing indexing options. This area is only enabled when the "Generate Index Labels" box has been checked.



MAPublisher Make Index dialog.

Creating an Index

1. Perform all of the steps from the first example for the Grid Generator on page 71.

2. Apply labels to several or all of the countries according to the steps outlined in the section on labeling (see Feature Text Label or Map Tagger Tool, pages 67-69).

3. Select Filter ➔ 3. MAP Legend ➔ Make Index.
   - *The Make Index dialog box appears.*

4. Click the "Text Objects" or "Features" radio button and set the "Layer" dropdown list to the layer containing the labels you created earlier. Set the "Grid Layer" dropdown list to the layer containing your grid.

5. If desired, you can check the "Remove Duplicate Entries" and/or the "Include Layer Name" boxes. The "Remove duplicate entries" option removes any duplicate entries from the file (i.e. If a feature is labeled twice and each label is in the same grid cell, only one entry will be made). The "Include Layer Name" includes the name of the layer with every entry in the file.

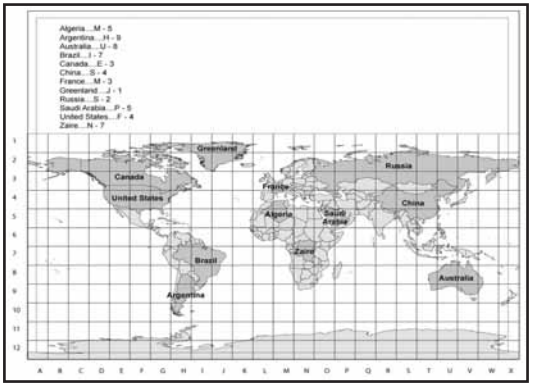
6. Decide what kind of delimiter you wish to use as well as how you want the file to be sorted and check the appropriate radio buttons.
   - The delimiter is what separates each field in the file. The file can be sorted by feature name (the file is sorted by the label itself, then the grid cell address, then the layer name (if present), by grid cell (the file is sorted by the grid cell addresses, then the labels, then the layer name or it can be sorted by layer name.

7. After all of the options have been set, click on the **Save As** button.
   - The Save File dialog box appears.

8. Name your index and click the **Save** button.
   - Both dialog boxes close and a text file is created based on the specifications entered in the Make Index dialog box.

This is a sample index file being viewed in Notepad. The index was text-based, custom-delimited and sorted by feature label.

9. The index you have just created may be inserted into your map document by creating an Adobe Illustrator text box and using the Place command. Please refer to your Adobe Illustrator user guide for more information on importing and inserting text.



The world.mif file with a grid layer and a placed index.

Note: When using featured-based indexing you cannot freely edit the feature labels once they have been placed. Labels that have been edited will not appear in the index text file created by the MAPublisher Make Index filter when feature-based indexing is used.

MAP CREATION

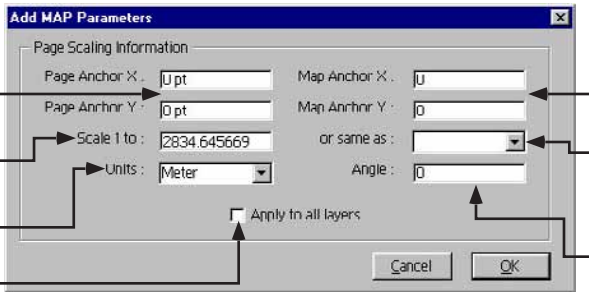
The Add Map Parameters and Assign Area/Line/Point/Text Defaults filters are used to create Illustrator layers and graphic elements with geo-referencing information and/or attribute data from non-GIS vector data. These filters essentially apply MAPublisher intelligence to normal Illustrator artwork and layers. The Add Map Parameters filter is used to give ungeo-referenced Illustrator layers geo-referencing data similarly to the way in which geographic parameters are automatically assigned when a GIS file is imported. The Assign Area/Line/Point/Text Defaults filters are used to make objects that are not MAPublisher-aware or recognized by MAPublisher into MAPublisher objects. Once an object has become a MAPublisher object, it can be given attributes using the MAP Columns and MAP Attributes filters.

These filters are also necessary to perform other MAPublisher operations such as index generation and legend creation.

ADD MAP PARAMETERS

The Add Map Parameters filter allows you to add geo-referencing information (map anchors, scale etc.) to any Illustrator layer. An ungeo-referenced map can be given proper referencing information very easily so that it can be manipulated as a normal map file.

Please familiarize yourself with the elements of the MAPublisher Add MAP Parameters dialog by reviewing the diagram below.



Page Anchor X/Y - Setting these values will add Page Anchors to the selected layer.

Scale 1 to - This value represents the scale that will be applied to the selected layer.

Units - Select which units your map's scale is in.

Apply to all layers - If you select this option, the page scaling information will be applied to every layer in the current document.

Map Anchor X/Y - Enter the values that you wish to use as your Map Anchors here.

or same as - This control allows you to select a layer that already has map parameters and assign those same parameters to the selected layer.

Angle - If you wish to assign an angle value to your map, enter it here.

MAPublisher Add MAP Parameters dialog.

Adding Geo-Referencing Information to an Ungeo-Referenced Map

1. Open the toronto.ai file from the tutorial_data folder on your MAPublisher CD.

2. Select Filter ➔ 4. MAP Creation ➔ Add MAP Parameters.
   - *The MAPublisher Add MAP Parameters window appears.*

3. Enter the map anchors in the "Map Anchor X/Y" fields. For this example, use -79.411893 and 43.611883, which are the lat/long co-ordinates for that portion of Toronto.

4. Select your the units of your map from the "Units" dropdown list. Select "meters" for this example.

5. Enter the scale of the map in the “Scale” field. For this example, use 0.235123.

6. Click the “Apply to all layers” checkbox so that the geo-referencing information is assigned to all layers in the document.

7. Click **OK**.
   - *The map now has geo-referencing information.*

If you wish to create a new Adobe Illustrator layer within a map document that has pre-existing geo-referenced layers, use the “same as” function to apply scale and page values to the new layer based upon the pre-existing layer.

ASSIGN AREA, LINE, POINT OR TEXT DEFAULTS

MAPublisher will not automatically recognize newly created (not imported) graphics as MAPublisher map objects. Graphics such as these need to be made MAPublisher-aware for object management (editing or updating) and use with the MAPublisher filters. This is done by assigning feature defaults to such elements. These filters can be used in many different situations, such as:

- For a layer that has no existing attribute information, attribute tables can be created and attribute values added.
- For a layer that has attributes associated with it, new features can be added to the layer and matching attribute fields can be applied to each of the newly created graphics.
- In the creation of legend elements, areas, lines, points, or text may be made MAPublisher-aware and thus able to be used in the creation of a legend (see The Assign Legend Info Filter and the Auto Assign Legend Info Filter, pages 57-59).
- For the creation of an index for a map that was not created with MAPublisher, labels can be made MAPublisher-aware and thus able to be used by the Make Index filter.
- For digitizing a scanned map and converting it to a geo-referenced map file.

Assigning Area, Line, Point or Text Defaults

1. Select the artwork that you want to become MAPublisher objects - area, line, point or text.

2. Select Filter ➔ 4. MAP Creation ➔ Assign Defaults (Area, Line, Point or Text).
   - *MAPublisher now recognizes these objects for performing MAPublisher operations. You can now add new columns and attribute data to the features or use them in the creation of a legend or index.*

Note: MAPublisher Defaults can be assigned to only one feature type at a time. For example, you cannot assign line defaults and area defaults to a group of lines and areas at the same time. You must first select one feature type and assign defaults to that group of art objects and then proceed to the next one(s).

The Assign Area/Line/Point/Text Defaults filters function invisibly when executed. As such you will not see any visible change to your document or workspace after executing either of these filters. However, if you open the MAP Attributes window you will see that the features to which Assign Defaults have been applied now have attributes associated with them.

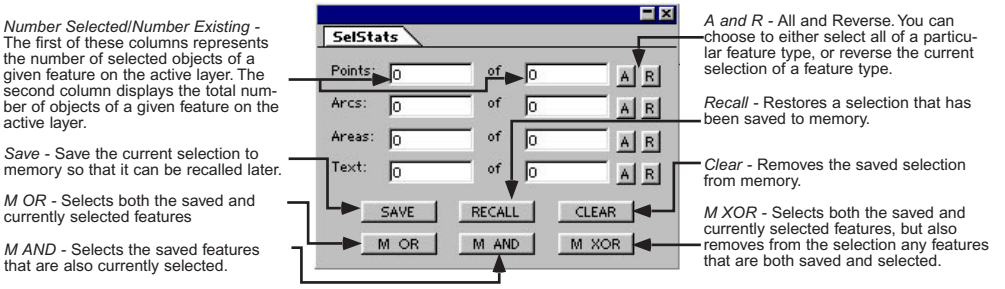
SELSTATS

The MAPublisher SelStats window (Window ➔ MAPublisher Statistics ➔ SelStats) keeps track of the total number of each type of map feature there are on a given layer, as well as how many of each feature type are selected at any given moment. It can be used to select all of a particular feature type or to reverse a particular selection. A selection of features can also be saved and recalled at a later time.

The MAPublisher SelStats function only counts MAPublisher objects. Objects that have been imported using MAPublisher will be automatically recognized by the SelStats function. You will have to use the Assign Area/Line/Point/Text defaults functions (see page 78) to make a non-MAPublisher object into a MAPublisher object in order to have it appear and be counted in the SelStats window.

Tip: The MAPublisher SelStats function is an excellent way to determine if all your drawn objects have been properly converted to MAPublisher objects using the Assign Area/Line/Point/Text defaults functions.

Please familiarize yourself with the elements of the MAPublisher SelStats dialog by reviewing the diagram below.



MAPublisher SelStats window.

Using the SelStats Window

1. Import any map file from the tutorial_data folder on your MAPublisher CD.

2. Select a portion of the map's features.

3. Select Window ➔ MAPublisher Statistics ➔ SelStats.
   - *The SelStats window appears. The total number of features and the number of features that are selected are displayed.*

4. Click the **R** button beside the feature type that you have selected.
   - *The selections made in step 2 are reversed.*

5. Click the **Save** button, deselect all features, then click **Recall**.
   - *All features that were selected after step 4 will be deselected and then reselected.*

6. Deselect all features and make another random selection. Click **M OR**.
   - *The selected set of features will now consist of both the saved features and the features you just selected.*

7. Deselect all features and make another random selection. Click **M AND**.
   - *The selected set of features will now consist of the features that are common to the saved selection set and the selection you just made.*

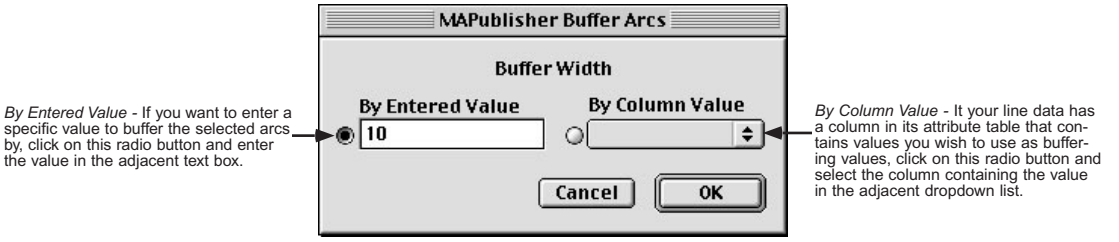
8. Deselect all features and make another random selection. Click **M XOR.**
   - *The selected set of features will now consist of the features that are not common to the saved selection set and the selection you just made.*

ARC FUNCTIONS

MAPublisher contains several tools and filters for working with map line segments, also known as arcs. The MAPublisher Arcs filters can be found under the Filter ➔ 6. MAP Arcs menu.

BUFFER SELECTED ARCS

The MAPublisher Buffer Selected Arcs filter creates a buffer “Area” object where there were previously arcs. When the Buffer Selected Arcs filter is run with the "By column value" option checked, an area object of varying widths is calculated and created. Applying the Buffer Selected Arcs filter based on an “Entered Value”, an “Area” object is created as calculated by the specified value, in map units. The buffering value 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 arc. 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.



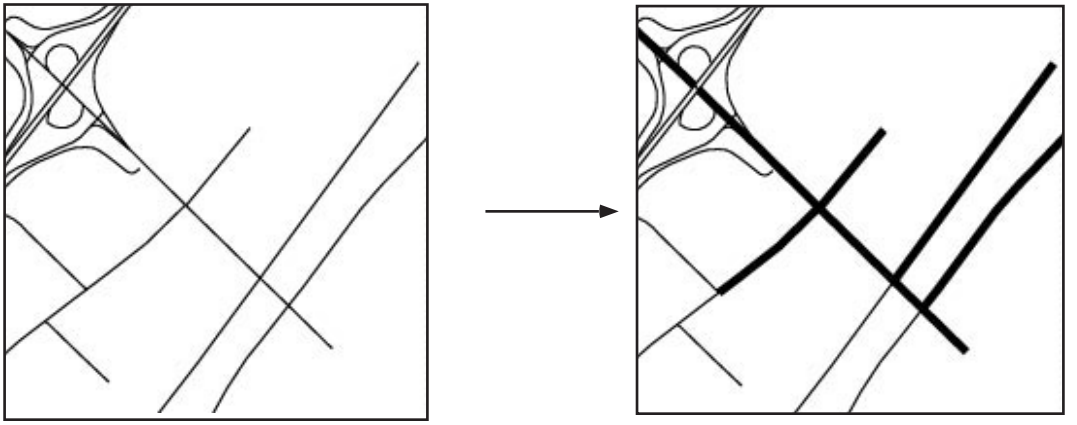
MAPublisher Buffer Arcs dialog.

Tip: When working with the Buffer Selected Arcs filter it is advisable to make a copy of your layer first as running the filter will replace your initial MAPublisher lines with a non-MAPublisher area. The buffer area will be of a width designated by the value used in the MAPublisher Buffer Arcs dialog but will not have any attributes or geo-referencing.

Tip: As the Buffer Arcs filter removes geo-referencing and database attributes, run Assign Area Defaults on the buffer to geo-reference it. If you need to export your buffer as a shape or mid/mif file, copy it to a new layer and make sure to run the Add MAP Parameters filter on this new layer first.

Buffering Arcs Using an Entered Value

1. Import the burl_roads.lin file from the tutorial_data folder on your MAPublisher CD.
2. Select a few lines to be buffered.
3. Select Filter ➔ 6. MAP Arcs ➔ Buffer Selected Arcs.
4. Click the “By Entered Value” radio button.
5. Enter 25 in the adjacent text box to represent a buffering value of 12.5 meters on either side of the selected road(s).
6. Click **OK**.
   - The original lines which were selected for buffering have been replaced by new area objects that represent a buffer created around the original lines of the specified width.



Before Buffer Arcs

After Buffer Arcs

Buffering arcs by column value will result in a buffering factor applied to each selected arc based upon the value found in the selected column, as opposed to a same value being applied to all arcs as is done using the entered value option.

FLIP SELECTED ARCS

The MAPublisher Flip Selected Arcs filter switches the beginning and end points of an arc or line. The Feature Text Label filter has been constructed to position labels starting at the beginning of an arc when following along lines 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 arcs, flipping some of the arcs may be necessary.

Flipping Selected Arcs

1. Import the torontostreets_joined.mif file from the tutorial_data folder on your MAPublisher CD.

2. Using the Select By Attribute filter (see Select By Attribute, page 40), select the lines that have a value in the Street column equal to COLLEGE ST and DUNDAS ST W. Note that the Boolean operator required for this expression is “OR” not “AND” as you may initially have thought.
   - The specified lines are now selected.

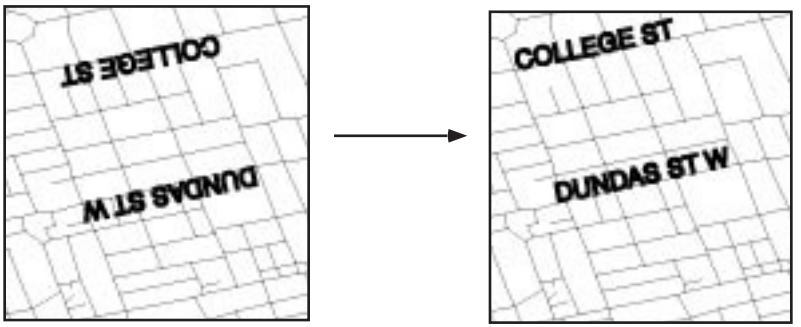
3. Select Filter ➔ 6. MAP Arcs ➔ Flip Selected Arcs.
   - The selected arcs will have their beginning and end points switched. Any labels placed along these arcs will now be oriented correctly.

4. Keep the lines selected and select Filter ➔ 3. MAP Legend ➔ Feature Text Label.

5. Set the "Feature" dropdown list to Lines and the "Column" dropdown list to Streets. Click on the "Follow Lines" checkbox and enter 40 in the "Percent along arc" textbox.

6. Click **OK.**
   - The selected lines are now labeled and the text is oriented correctly.

Note: If you label the same lines without flipping them, the labels will appear upside down.

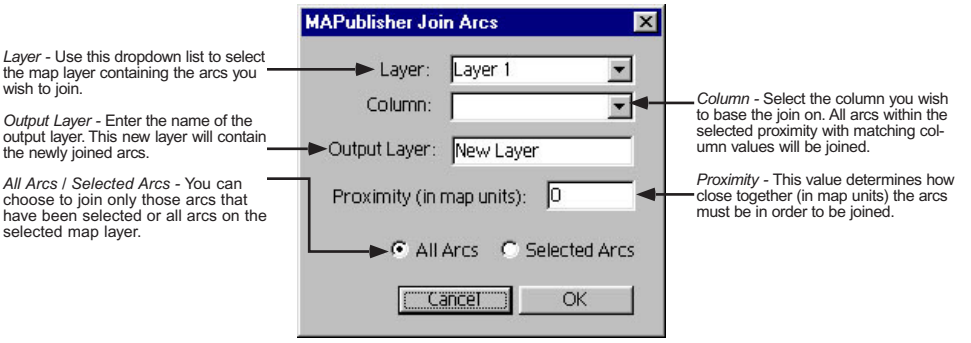


Without flipping arcs

With flipping arcs

JOIN ARCS

The Join Arcs 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 Arcs 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 layer contains the joined lines with an attribute column representing the joined column. All other attributes that were present in the pre-joined layer will not be present in the new layer. The Join Arcs filter is 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 the Join Arcs filter prior to running the Feature Text Label filter in order to eliminate the occurrence of duplicate labels.



The MAPublisher Join Arcs dialog.

Joining Arcs

1. Import the torontostreets.mif file from the tutorial_data folder on your MAPublisher CD.

2. Select Filter ➔ 6. MAP Arcs ➔ Join Arcs.
   - *The MAPublisher Join Arcs window appears.*

3. Set the “Column” dropdown list to Street in order to join the lines by their street name value.

4. Enter “joined streets” in the “Output Layer” text box. This will be the name of the new layer containing the joined lines.

5. Enter .0001 in the “Proximity” text box.

6. Check the All Arcs radio button to choose to join all the arcs on the layer.

7. Click **OK**.
   - A new layer is created wherein all the specified arcs are joined based on the specifications set in the dialog.

Tip: A proximity factor of 0 will only join arcs that are touching.

Note: When working with data in lat/long the proximity factor is a very small number, as in the above example.

SPLINE SELECTED ARCS

The Spline Selected Arcs 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 arcs, more commonly referred to as Bezier curves. The Spline Selected Arcs filter functions without the use of a dialog. When selected 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.

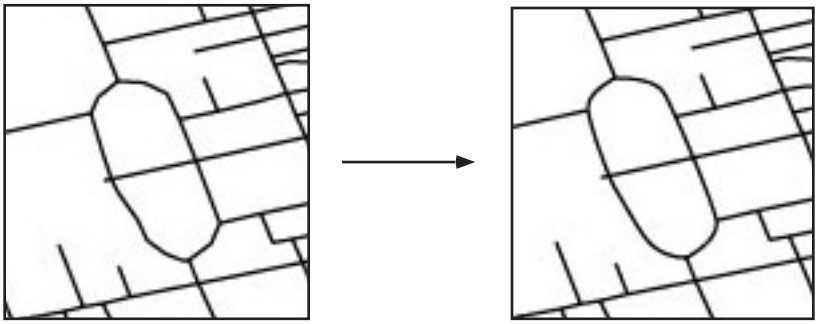
Splining Selected Arcs

1. Import the torontostreets_joined.mif file from the tutorial_data folder on your MAPublisher CD.

2. Find and select one or more arcs that you want to spline (smooth). For the purpose of this example choose the large ellipse in the upper centre of the map (Queen's Park Cres. E & W).

3. Select Filter ➔ 6. MAP Arcs ➔ Spline Selected Arcs.
   - *The selected arcs are transformed into Bezier curves with extended handles from each point.*

4. Try modifying the curve by dragging the handles that extend from each point to further improve its shape.



Without splining arcs

After splining arcs and smoothing out the lines.

Note: Bezier curves will not export as curved lines to any of the GIS data formats supported by MAPublisher.

SIMPLIFY ARCS

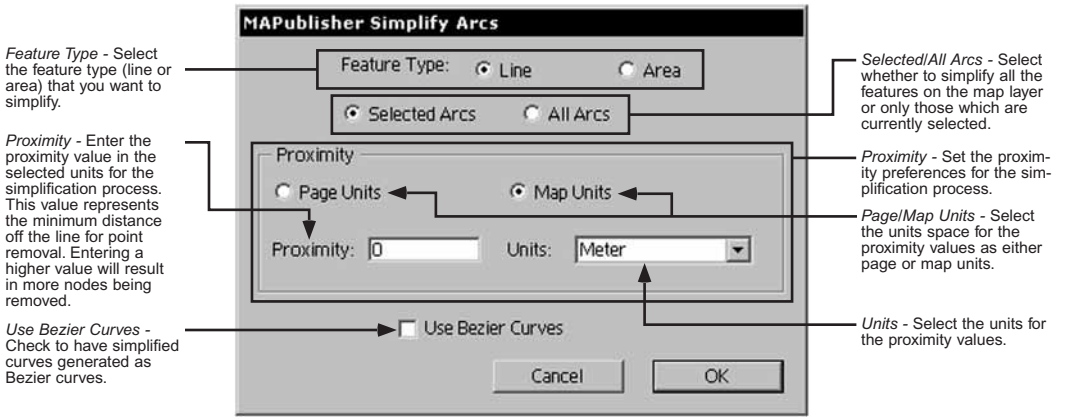
The MAPublisher Simplify Arcs filter allows for the simplification or generalization of imported vector data based upon map or page units. The MAPublisher Simplify Arcs function uses the popular Douglas-Peucker algorithm for removing nodes and vertices during the simplification process. For more information on the Douglas-Peucker algorithm please see Appendix 1, page A1-28.

Simplify Arcs 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 co-ordinates. The MAPublisher Simplify Arcs function can be used on line or area features 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. This is where the Simplify Arcs function differs from the Grain function found within the MAPublisher Import Map filter. The Douglas-Peucker algorithm takes the proximity value you give it and iterates through the line vertices to determine the points which 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 result in a fewer number of nodes being removed.

Tip: 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.

The MAPublisher Simplify Arcs filter can be found under Filter ➔ 6. MAP Arcs. Please familiarize yourself with the MAPublisher Simplify Arc dialog by reviewing the diagram below before trying the example on the following page.



The MAPublisher Simplify Arcs dialog.

Simplifying Arcs

1. Import the riverskm.shp file from the tutorial_data folder on your MAPublisher CD with the Map Units set to kilometers.

2. Select all of the arcs in the “riverskm” layer and select Filter ➔ 6. MAP Arcs ➔ Simplify Arcs.
   - *The MAPublisher Simplify Arcs dialog appears.*

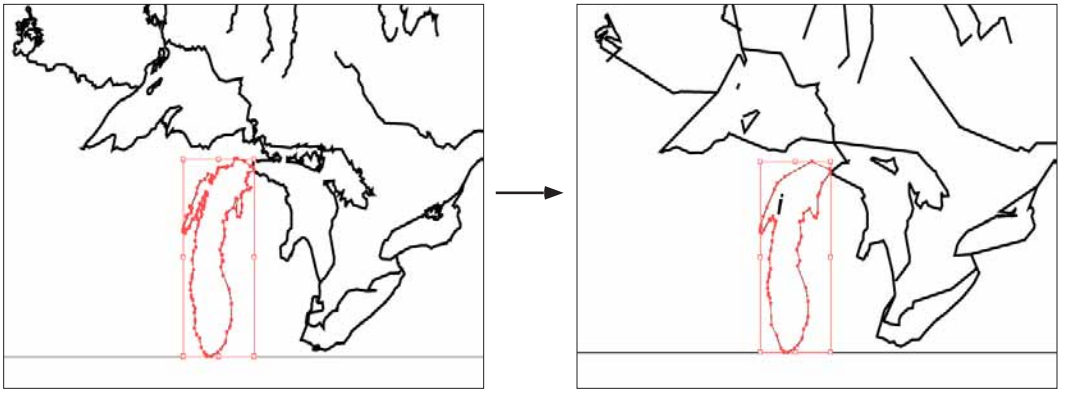
3. Set the “Feature Type” radio buttons to “Line” as the artwork in this layer consists of arcs or lines. The MAPublisher Simplify function can also be performed on area or polygon features.

4. Check the “Selected Arcs” radio button to indicate that the simplify function is to be performed on the selected features only.

5. Check the “Map Units” radio button in the “Proximity” section of the dialog, set the “Units” to “kilometer” and specify a “Proximity” value of 25.
   - This will set the simplification parameters to remove nodes that are less than 25 kilometers apart in map units.

6. Check the “Use Bezier Curves” option if you want the simplification process to incorporate Bezier curves.

7. Click **OK** to start the simplification process.
   - The selected arcs are now simplified based on a proximity value of 25 kilometers. Data can also be simplified using a proximity value in page units.



Section of the riverskm.shp file in Adobe Illustrator both before (left) and after executing the MAPublisher Simplify Arcs function with a proximity value of 25 km. Notice the significant reduction in the number of vertices and resulting loss of detail. These screenshots were taken at more than a 300% zoom level. At 100% the reduction in detail is not as noticable.

WORKING WITH TABLES

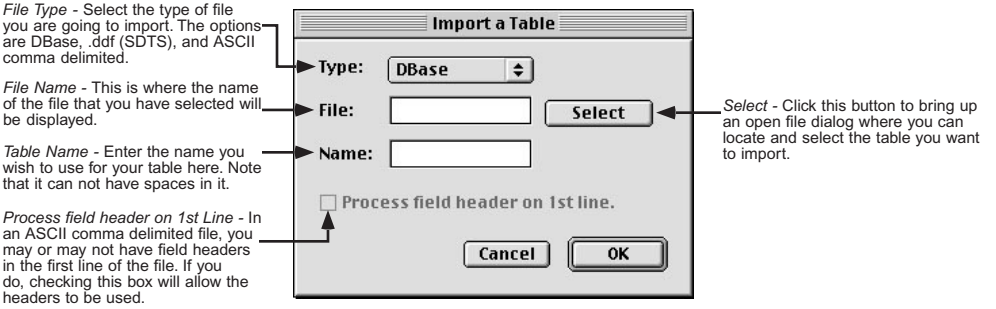
MAPublisher includes several filters and tools for importing and viewing external data tables and for joining external tables with pre-existing map attribute tables. If, for example, you had a map of areas representing postal zones and an external data file containing sales or population figures by postal 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.

IMPORT A TABLE

The MAPublisher Import a 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 a Table filter provides support for three of the most common table formats as follows:

- DBase files (.dbf)
- USGS SDTS files (.ddf)
- ASCII Comma Delimited files (.csv, .dat, .txt, etc.)

Familiarize yourself with the Import a Table dialog by reviewing the diagram below.



MAPublisher Import a Table dialog.

Note: With the ASCII Comma delimited import option all columns are named "Column 1", "Column 2" ..... etc. unless a header is present in the file containing actual column names and the "Process field header on 1st line" box is checked.

Note: Table names may not have spaces in them. Use the underscore (_) instead. For example, use "population_counts" rather than "population counts".

Importing a Table

1. Select Filter ➔ 7. MAP Tables ➔ Import a Table.
   - Import Table screen appears.

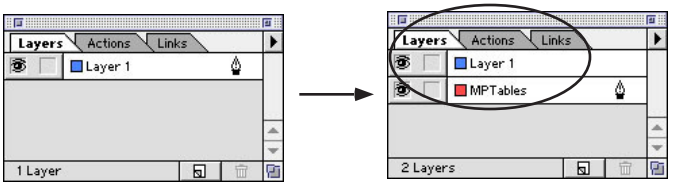
2. Set the “File Type” dropdown list to ASCII comma delimited.

3. Click the **Select** button and select the avg_inc.csv file from the tutorial_data folder on your MAPublisher CD.

4. The default table name will be the same as the file’s name. You may change this by typing a new name into the Table Name field. The table name cannot include spaces. Everything after the first space will be left out.

5. Click the “Process field header on 1st line” checkbox so that the column headings contained in the first line of this file are used as column headers in the MAPublisher table.

6. Click **OK**.
   - The table is imported to a layer called “MPTables”. The table may be accessed using the Table Columns and Table Records filters (see Table Columns and Table Records, pages 93-95)

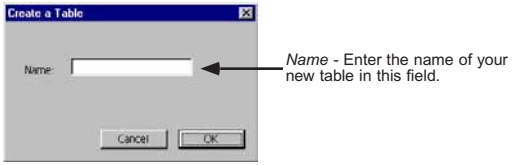


The contents of the imported table are stored in a layer called MPTables.

Note: The first time a table is created or imported a new layer is created in the Adobe Illustrator layers palette with the default name “MPTables”. This is where MAPublisher stores all tables that have been imported or created by the user. Deleting the MPTables layer will result in the deletion of all currently stored tables.

CREATE A TABLE

MAPublisher lets you create your own custom tables to merge with existing map data attributes. New tables can have new columns/records added by using the Table Columns and Table Records filters.



Creating a New Table

1. Select Filter ➔ 7. MAP Tables ➔ Create a Table.
   - *The New Table window appears.*

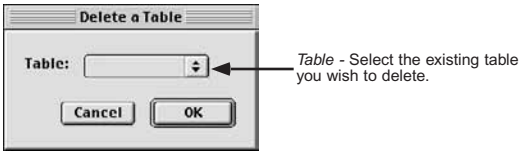
2. Enter a name for the table into the “Name” field.

3. Click **OK**.
   - *The new table is created on the “MPTables” layer.*

4. After creating the new table use the Table Columns filter (page 94) to add new columns to the table. Use the Table Records filter (page 95) to add, edit and view the table’s records.

DELETE A TABLE

MAPublisher lets you easily delete any previously imported or created tables.



Deleting an Existing Table

1. Perform all of the steps from the “Create a Table” or “Import a Table” examples.

2. Select Filter ➔ 7. MAP Tables ➔ Delete a Table.
   - *The Delete Table window appears.*

3. Select the table that you created in step 1 from the “Table” dropdown list.

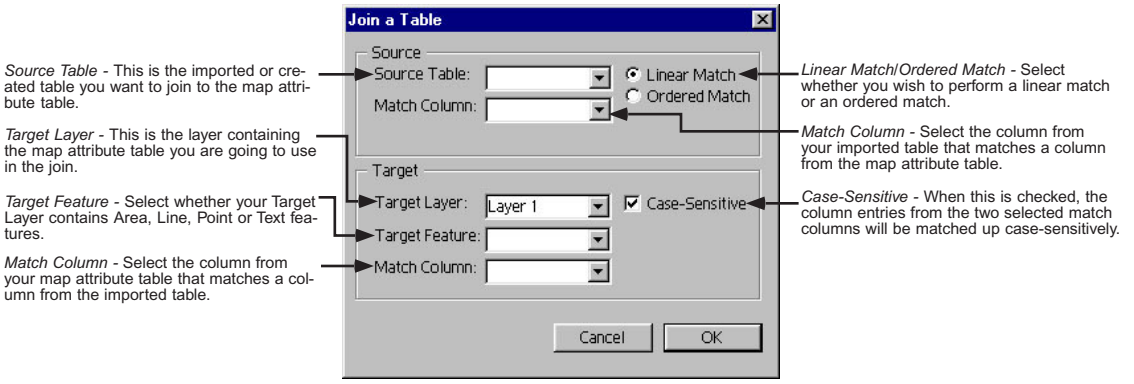
4. Click **OK**.
   - *The selected table is deleted from the “MPTables” layer.*

Note: The “MPTables” layer will not be deleted by MAPublisher even if all the tables have been deleted. If desired, the “MPTables” layer may be removed manually using the Adobe Illustrator delete layer function.

JOIN A TABLE

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

Please familiarize yourself with the elements of the MAPublisher Join Table dialog by reviewing the diagram below.



Linear Match vs Ordered Match - Setting the match radio button to "Linear Match" will result in a slower matching process than setting it to "Ordered Match" but the table and layer 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.

Joining an External or Created Table to a Map Attribute Table

In this example you will be joining an imported comma-delimited file containing average income information with an existing GIS file containing residence and business counts. The attribute common to both files is postal zone (FSA).

1. Import the fsatoronto.mif file from the tutorial_data folder on your MAPublisher CD.

2. Import the avg_inc.csv table from your MAPublisher CD (see Import a Table, page 88).

3. Select Filter ➔ 7. MAP Tables ➔ Join a Table.
   - *The MAPublisher Join a Table Window appears.*

4. Set the "Source Table" dropdown list to the "avg_inc" table.

5. Set the "Match Column" dropdown list to "FSA". This is the imported table's data column that is common to a column in the map layers's attribute table.

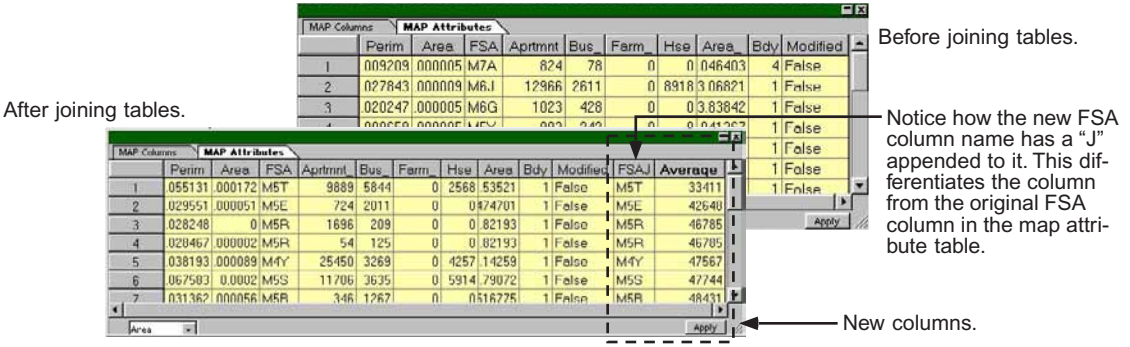
6. Click on the "Linear Match" or "Ordered Match" radio button as desired. Linear match is slower but does not require that the match column be sorted. Ordered Match is faster but the match column must be sorted the same way in the imported table as in the map attribute table.

7. Set the "Target Layer" dropdown list to "fsatoronto".

8. Set the “Target Feature” dropdown list to “Area”.

9. Set the second “Match Column” dropdown list to “FSA”. This is the attribute column that is common to a column from the table.

10. Click **OK**.
    - The imported table will be joined with the attribute table. To view the changes, open the MAP Attributes window and select some or all of the map’s features (see MAP Attributes, page 35).



Your map layer attribute table should look similar to the one above after the join has been completed.

Joining SDTS Tables

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.

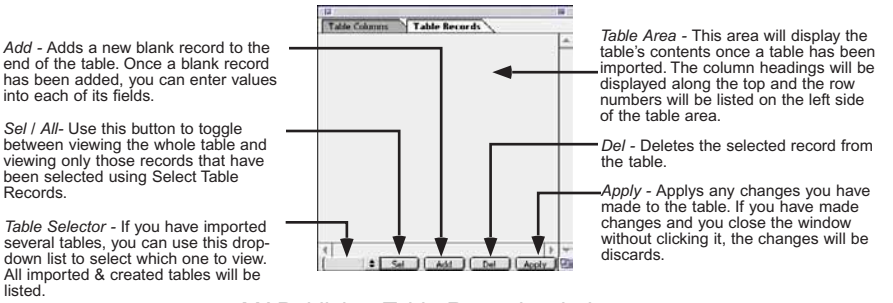
To find the SDTS tables to join with the vector map file look for the files which have names that start with the same character string as the name of the vector file. MAPublisher imports SDTS files that have the characters “LE” in the fifth and sixth positions of the file name (ex.HY01**LE**01.ddf). The LE stands for line entities and it is files of this nomenclature that contain the actual vectors. A typical table to import and join with this file might be called HY01ACOI.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: The CATD catalog file found amongst the SDTS files explains what each table is.

TABLE RECORDS

The Table Records window displays the records for an imported or created table and lets you change them as desired. You can add new records and switch between viewing all records and viewing only the selected records.

Please familiarize yourself with the elements of the MAPublisher Table Records dialog by reviewing the diagram below.



MAPublisher Table Records window.

Viewing, Editing and Deleting Table Records

1. Import the avg_inc.csv table from the tutorial_data folder on your MAPublisher CD (see Import a Table, page 88).

2. Select Window ➔ MAPublisher Tables ➔ Table Records.
   - *The Table Records window appears.*

3. To change the value of a field, double click (option-click on Mac) on it and enter the new value. Keep in mind that you must enter values that correspond with a column's type (ie. only type numbers into a column of type "Real" etc.). Randomly change some field values.

4. Click **Add.**
   - *A new blank record is created.*

5. Select a row by clicking on the row number and click **Del**.
   - *The selected record is deleted.*

6. Click **Apply** to commit the changes. Closing the window without clicking apply will discard any changes you made.

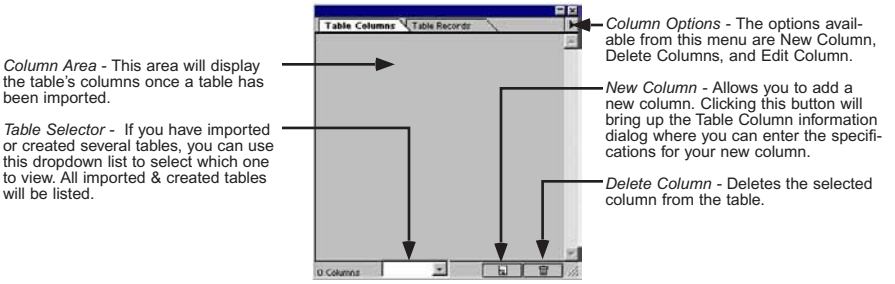
7. Using the Select Table Records filter, select a set of records to view (see Select Table Records, page 95).

8. Return to the Table Records window and click **Sel**.
   - *Now only the selected records will be displayed in the window. The **Sel** button will become the **All** button. Click it to return to viewing all the records in the table.*

TABLE COLUMNS

The Table Columns filter allows you to view, edit, and create new columns for an imported or created table.

Please familiarize yourself with the elements of the MAPublisher Table Columns dialog by reviewing the diagram below.



MAPublisher Table Columns window.

Adding a New Column to an Imported or Created Table

1. Import the avg_inc.csv table from the tutorial_data folder on your MAPublisher CD (see Importing a Table, page 88).

2. Select Window ➔ MAPublisher Tables ➔ Table Columns.
   - The Table Columns window appears displaying the columns associated with your table records.

3. Click the new column button or select Option (▸) ➔ New Column.
   - The Table Column window appears.

4. Enter a name for your column, as well as a type and a maximum length.

5. Click **OK**.
   - The new column is created and can be given values using the Table Records filter (see Table Records, page 93).

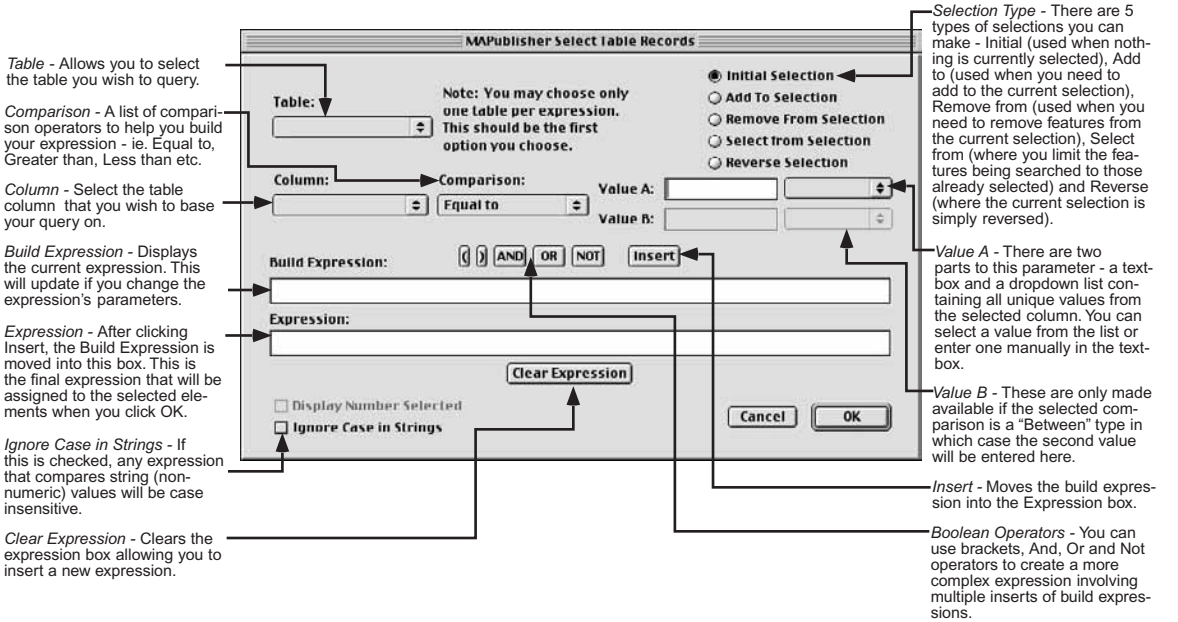
Deleting / Editing a Column of an Imported or Created Table

The functions to delete or edit a table column operate in the same way as do the same functions for MAP Attribute tables. Please see the section on deleting and editing MAP Attribute tables on page X. These functions may be accessed in the Table Columns dialog by selecting the Option (▸) button.

SELECT TABLE RECORDS

This filter is used to select a particular set of records from an imported or created table. It functions very similarly to the Select Map Attributes filter. Select Table Records contains the following options: Initial Selection, Add to Selection, Remove from Selection and Select from Selection and Reverse Selection.

Please familiarize yourself with the elements of the MAPublisher Select Table Records dialog by reviewing the diagram below.



Selecting Records From an Imported or Created Table

1. Import the avg_inc.csv table from the tutorial_data folder on your MAPublisher CD (see Importing a Table, page 88).

2. Select Filter ➔ 7. MAP Tables ➔ Select Table Records.
   `- *The MAPublisher Select Table Record window appears.*

3. Click on the "Initial Selection" radio button.

4. Set the "Table" dropdown list to "avg_inc" and set the "Column" dropdown list to "Average_Income".

5. Set the "Comparison" and "Value A" dropdown lists to "Greater than" and "50729", respectively.

6. Click **Insert**, then **OK**.
   - The records matching your criteria are selected. They can be viewed using the Table Records filter (see page 93).

OTHER TOOLS

MAP AREA TOOLS

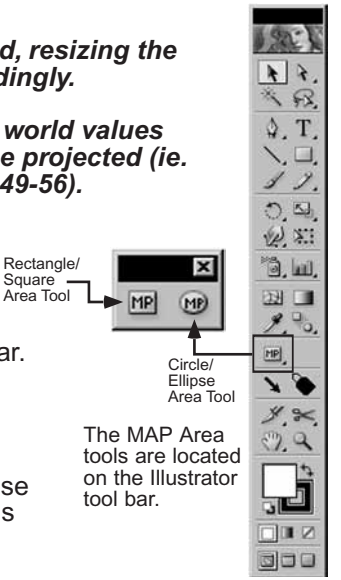
MAPublisher 5.0 includes two tools for drawing rectangular and elliptical areas of specified dimensions in map units. By using the MAP Area tools, areas of exact map dimensions can be quickly added to any map document. This tool can also be useful for measuring distances from a specific location. Each area is created accompanied by statistical information (area and perimeter values) which are grouped together. The reported units and size values will be directly related to the scale and units of the layer on which the area has been drawn. 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. Areas created using the MAP Area tools are special and will be not be automatically recognized as MAPublisher areas. They can be converted to MAPublisher areas using the Assign Area Defaults filter (see page 78).

Note: As long as the caption text and area object remain grouped, resizing the area will result in the caption figures being updated accordingly.

Note: In order for the area tools to draw properly and return real world values for the area and perimeter caption figures the layer must be projected (ie. not in lat/long). See Projections & Transformations (pages 49-56).

Using the MAP Area Tools

There are two methods of using the MAP Area tools as follows.



The MAP Area tools are located on the Illustrator tool bar.

1. Select the desired MAP Area tool from the main Illustrator tool bar. 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 along with two captions indicating the area's perimeter and area values. The caption text and area polygon will be created as a grouped object. Simply ungroup the object if you wish to move or remove the captions.

2. Select the desired MAP Area tool from the main Illustrator tool bar. Then click on a single spot in your document. The MAPublisher Add Area dialog will appear into which you can enter specific dimensions for the area to be drawn. When you click **OK** to accept the entered values an area will be drawn accordingly with its upper left corner at the spot where you initially clicked. If instead you wish to have the area centered over the click point simply check the "Center area on click" box in the MAPublisher Add Area dialog.

Note: When using area tool method 2 the area and perimeter caption values may be inconsistent with the values entered in the dialog due to floating-point rounding.

Note: Objects created by the MAP Area tools are not modifiable as art objects other than resizing.

The MAPublisher Add Area dialog.

MAP COPY/PASTE

The MAPublisher MAP Copy/Paste function is designed to safely copy and paste MAPublisher objects between Illustrator layers while retaining the geographic and attribute characteristics of the objects. In order to perform a MAPublisher copy/paste operation one must use the MAP Copy/Paste Object tools which can be found under Object ➔ MAP Copy Object in the main Illustrator menu bar. 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/Paste Object(s) will also allow for non-MAPublisher objects to be copied and pasted independently or in conjunction with MAPublisher objects.

Note: The Paste MAP Object(s) menu item will be greyed-out and inaccessible if a MAPublisher paste operation is not permitted.

Using MAP Copy/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 select Object ➔ MAP Copy Object ➔ Copy MAP Object(s). The objects will then be placed on the clipboard.

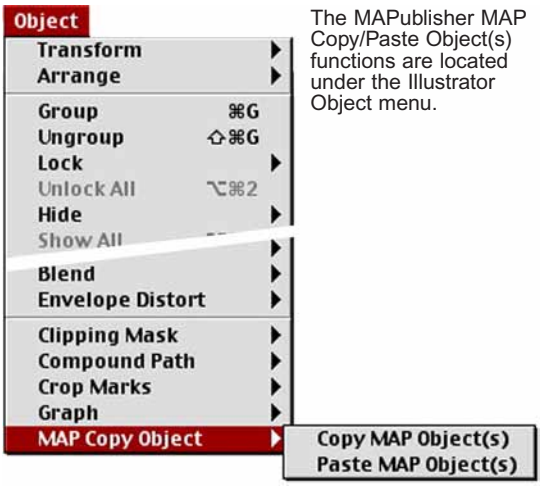
To paste the chosen object(s) to another layer select the destination layer from the Illustrator layers palette and then select Object ➔ MAP Copy Object ➔ Paste MAP Object(s). The objects will then be placed on the destination layer. Pasted objects are placed in the same location on the document from where they were copied.

If the destination layer does not have any geographic parameters (scale, anchors, projection etc.) MAPublisher will automatically assign the same parameters as the layer from which the objects were copied.

Note: Objects may NOT be copied and pasted between documents using the MAP Copy/Paste tools.

Note: MAPublisher objects may only be copied and pasted between layers that contain other MAPublisher objects if the attribute tables match (ie. all attribute columns must be the same on both layers).

Note: 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.



The MAPublisher MAP Copy/Paste Object(s) functions are located under the Illustrator Object menu.

EXPORTING

EXPORT AS SHAPEFILE, MID/MIF OR ARCINFO EXPORT FORMAT

To view your map data files within a GIS environment, MAPublisher provides for the export to several popular geographic software formats, MapInfo and ESRI shapefiles as well as text only export to ArcInfo .e00 format.

ArcView Shapefiles are binary files used to export data with attributes from both ArcInfo and ArcView. MAPublisher creates three files for every map layer exported: .SHP, .DBF and .SHX. MAPublisher 5.0 can export area, line and point data to ArcView Shapefile format.

MapInfo Interchange Format (mif) is an ASCII file format that fully describes a MapInfo database. MAPublisher 5.0 can export area, line, point and text data to MapInfo Interchange Format. Colours, strokes and projections are not supported in MAPublisher mid/mif export.

ArcInfo Export format (.e00) is also an ASCII file format. MAPublisher 5.0 only exports text to ArcInfo Export format.

Exporting Data into GIS File Formats

1. Import the regional_south_china_sea.shp and world.mif files from the tutorial_data folder on your MAPublisher CD.

2. Select File ➔ Export.
   - *The Adobe Illustrator Export window appears.*

3. Set the “Save As Type” dropdown list to MapInfo Mid/Mif and enter a desired file name.

4. Click **Save**.
   - *The Export window closes and the file Export box appears.*

5. Set the “Layer” dropdown list to regional_south_china_sea and the “Feature Type” dropdown list to Area.

6. Click **OK**.
   - *The selected feature type from the selected layer is exported to MapInfo Mid/Mif format.*

7. Select File ➔ Export.
   - *The Adobe Illustrator Export window appears.*

8. Set the “Save As Type” dropdown list to ArcView Shapefile and enter a file name.

9. Click **Save**
   - *The Export window closes and the Shapefile Export window appears.*

10. Set the “Layer” dropdown list to world and the “Feature Type” dropdown list to Area.

11. Click **OK**.
    - *The selected feature type from the selected layer is exported to ArcView Shapefile format.*

12. Using the MAP Tagger Tool, label some of the features on one of the layers.

13. Select File ➔ Export.
    - *The Adobe Illustrator Export window appears.*

14. Set the “Save As Type” dropdown list to ArcInfo E00.

15. Click **Save**.
    - *The Export window closes and the ArcView e00 Export window appears.*

16. Set the “Layer” dropdown list to whichever layer you created the labels on.

17. Click **OK**.
    - *The selected layer’s text labels are exported to ArcInfo Export format.*

Note: Not all Adobe Illustrator objects will be exported properly to every GIS application, especially curves, circles and ellipses.

APPENDICES

APPENDIX 1 - TECHNICAL REFERENCE GUIDE

FILE FORMATS

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) geographic images from the United States Geological Survey (USGS) 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 SUPPORTED GIS FILE FORMATS

This section contains brief descriptions of the GIS formats supported for import by MAPublisher. You can also refer to the Frequently Asked Questions section in this guide for information on any issues associated with the various file formats. Following this section you will find a segment on other GIS Software with the formats that they export that are compatible with MAPublisher. As well, there is a reference on our web site at http://www.avenza.com/support.links.html where we have compiled a listing of some available GIS data format translators. Also see File Formats on pages 15 to 17.

ArcInfo Export Files

ArcInfo Export (e00) is a transfer 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). Also see page 15 for more information on this format.

ArcInfo Ungenerate Files

ArcInfo Ungenerate files are ASCII co-ordinate files created from ArcInfo coverages through the use of the ArcInfo Ungenerate command. Ungenerate is a useful mechanism that allows you to transfer ArcInfo GIS data to MAPublisher. These files contain the user/cover–ids for line, point or polygon features. If you have a unique numeric value or feature code that you wish to use in MAPublisher, simply calculate the user/cover–id to that value or code. For example, if the cover is called lakes, use the ArcInfo command: Calculate Lakes–id = 'your feature code'. Remember to do this before running the Ungenerate command. If any of the cover–ids are equal to zero, the Ungenerate function ignores the associated graphics and excludes them from the Ungenerate file. Also see page 15 for more information on this format.

ArcView Shapefiles

ArcView shapefiles are binary files 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”. MAPublisher requires three files for every map layer to be imported:

xxxx.shp - this file contains the vector information
xxxx.dbf - this file contains the attribute information
xxxx.shx - this file is a cross reference file for the .shp and .dbf files

If any of the three files are missing the file will not import properly. To export annotation/text out of ArcInfo for import into MAPublisher use the ArcInfo export to DXF format or ArcInfo export format (e00). Also see page 16 for more information on this format.

AutoCAD DXF

AutoCAD DXF is an ASCII file format exported by many CAD programs including AutoCAD. MAPublisher currently supports the AutoCad DXF format up to Rev 14. Not all DXF formats are the same. See the Frequently Asked Questions section in this guide for some of the issues that you may encounter with work-arounds where available. Also see page 16 for more information on this format.

MapInfo MID/MIF

According to the MapInfo Professional Reference manual, “MapInfo Interchange Format (MIF) is an ASCII file format that fully describes a MapInfo database. Both graphic and tabular data are exported into mif files. The graphic data is in a file with a “.mif” extension, and the tabular data is in a file with a “.mid” extension.” When exporting from MapInfo, you (or your data provider) should specify the type of file export to perform as being MapInfo Interchange Format MIF (default). The export facility will generate both the “.mif” and “.mid” files.

Mif files contain all the vector data and mid files contain all the attribute data. When you select a mif file, the associated mid file is automatically added to the appropriate entry in the MAPublisher Import dialog. Selecting a mid file instead of a mif file causes the import process to fail. With MapInfo, users often work with latitude and longitude (lat/long) map co-ordinates. Also see page 16 for more information on this format.

MicroStation DGN

MicroStation Design Files or DGN (.dgn) are the native files created by Bentley Systems Inc.’s MicroStation product. MAPublisher 5.0 supports the import of MicroStation J, SE and 95 version DGN files. For more information on DGN format files as they relate to use with MAPublisher see page 17 of this user guide.

USGS DLG - Optional

Digital Line Graph (DLG) is a USGS standard file format which consists of feature information in digital vector form. These files include information on planimetric base categories such as transportation, hydrography, and boundaries. MAPublisher currently imports the Optional distribution format, which is usually in meters in the UTM co-ordinate system. This file format will have the extension “.opt” or “.do”. Also see page 17 for more information on this format.

USGS DLG - SDTS

Spatial Data Transfer Standard (SDTS) is 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, geo-referencing, 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. See the body of this manual for procedures on how to handle and work with this complex format. Also see page 17 for more information on this format.

For more information on USGS data formats vist the USGS website at http://www.usgs.gov

MAPUBLISHER COMPATIBLE EXPORT FORMATS

The list below provides a quick reference guide for transferring data between various GIS programs and Adobe Illustrator via MAPublisher. The bold items list several of the most common GIS software products and the unbold items list the corresponding export format that is supported by the MAPublisher Import Map filter. There are also a number of file format translators available including FME from Safe Software (www.safe.com).

ArcInfo: Ungenerate, Shapefile, ArcInfo Export

Arcview: Shapefiles

Atlas: AGF output with translator to shape (PC only) on the ESRI website at www.esri.com

AutoCAD/AutoCAD Map: MapInfo Interchange Format (mid/mif), DXF

ESRI Business Map: Shapefiles

Intergraph: DXF

MapInfo: MapInfo Interchange Format (mid/mif)

TIGER: Tiger2Mif or Tiger2Shape (www.gistools.com)

TransCAD: MapInfo Interchange Format (mid/mif), Shapefiles

MicroStation: DGN

FREQUENTLY ASKED QUESTIONS (FAQS)

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

I have installed MAPublisher but nothing shows up in the Illustrator filters menu.

You have likely installed MAPublisher to an incorrect location. Do a search on your hard drive for the MAPublisher filters in order to determine where you have actually installed them and then simply move the MAPublisher 50 folder into your Adobe Illustrator plug-ins folder. You can also rerun the MAPublisher installer and this time direct it to the correct location of your Illustrator 10 plug-ins folder.

I have installed MAPublisher but in trying to enter the security keycode the Enter Security Code filter is greyed out.

You must create a new Illustrator document (File ➔ New) in order to make the Enter Security Code filter accessible.

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 file and then restarting Adobe Illustrator:

- In Windows the preferences file is most often found in c:\Documents and Settings\username\Application Data\Adobe\Adobe Illustrator 10 but depending upon your version of Windows it may appear in the top level of the Adobe Illustrator folder. In either case it is named AIPrefs.
- On the Macintosh platform the preferences file is found in the Adobe Illustrator 10 folder in the Preferences folder inside the System Folder. It is named Adobe Illustrator 10.0 Prefs.

Also check under Edit ➔ Preferences ➔ Plug-ins & Scratch Disks and ensure that the correct location of your plug-ins folder is indicated.

The MAPublisher Enter Security Code filter does not accept my keycode.

When you purchase MAPublisher, you will receive a keycode for each license. These keycodes have the following format: MPxxyz-**********. In total there are 23 alpha-numeric characters and a dash (-). When entering the code please note that the keycode is case sensitive and that the dash (-) must be included.

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 A1-15 & A1-16.

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 MAPublisher Projection Editor (see pages 49-53).

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, we may have other suggestions.

Why do my shapefiles crash on import?

There are a couple of possible common 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 will 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 from different projections or co-ordinate 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/co-ordinate systems, any software will give you the same results. When you import them and choose **Defaults**, compare co-ordinate values of the map anchors between the two files, you will probably see an obvious difference. Did you get the data from a single source? Can you check with the source as to the projection(s)? If you can find out the projections or co-ordinate systems of the two files you should be able to project them to a common system. If the projections are known, you can use the projection 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 specifically 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 will probably crash MAPublisher. Make sure that you do all FTP transfers as binary. If you do not have the tar decompression utility there are versions available in the utilities folder on your MAPublisher 5.0 CD. 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 xxxxLE01.DDF. The LE stands for Line Entities and it is this file that actually contains the vector lines and vertices. It is usually the biggest file of the set. Select the xxxxLE01 or xxxxLE02, etc. files, hit **Defaults** and the lower left X,Y co-ordinates and the scale will be calculated.

Map sheets or tiles that should be adjacent, but are not.

When importing adjacent map sheets or tiles, use the **Defaults** button on the tile that is most south and west (lower left) to find the map anchor and then do not run **Defaults** again. Use the “same as” function instead. If you reset the map anchor, the tiles will very likely display on top of one another or won’t line up. If the adjacent sheets are in adjacent UTM zones, you will need to make sure that they have all been ”re–projected” into a common zone to display properly as adjacent tiles.

I am having trouble with importing DXF files. Where am I going wrong?

The MAPublisher Import filter currently supports AutoCAD R14 files. There are many CAD programs that use DXF or export to DXF. The DXF output may vary depending on the source program. We cannot compensate for these variations. If you are using AutoCAD you must run the EXPLODE BLOCKS command in AutoCAD before saving as DXF R14. Some DXF files are formatted in ASCII text, therefore care must be taken when transferring them on a mixed platform network. If you use ftp then be sure to transfer the files with the text option to avoid problems. Also make sure that the DXF files in question are in ASCII format, not binary.

When I import point data it comes in slightly off shifted from where it's supposed to be.

Points that have been imported using either the Import Map or Import Points filters or created using the Point Plotter will be initially positioned with the symbol's anchor point (lower left corner of the bounding box) placed directly over the geographic location of the point. This means that the actual centre of the symbol will not be over the geographic co-ordinates as is often desired. In order to reposition your point symbols with the centre over the geographic location of the feature please follow the instructions on page 33 of this manual.

Is there a restriction on the number of points in a path and how do I determine how to set the grain value in order to thin a file on import?

Adobe Illustrator 10 has a limitation of approximately 32,000 points on a single path. To compensate for this use the grain option in the MAPublisher Import filter. You may have to experiment with a few values. Picking a grain is not an exact science. Your data's source scale and co-ordinate system are the major influences on determining the optimal grain value. A good rule of thumb is to think about the size of the map units. A map that is in UTM (Universal Transverse Mercator) usually has map units in meters. These are units that encompass a relatively small area, so you will want your grain to be in multiples of that unit - try starting with a grain of any where from 1 to 100 This is where the scale of the source data may come into play as well if it is a larger scale, with more detail a smaller grain may be wise to avoid too much loss of detail. If it is a smaller scale, with less detail, then you can use a larger grain value.

Why do some of my imported polygons have missing points?

Adobe Illustrator 10 has a limit of 32,000 points/vertices per path. The reason that you get the straight line is that some points must be dropped from the path in order to stay within the limit. The solution is to use the grain option on import to reduce the frequency and number of points in the path. You can then retain the desired shape. It may take some experimentation with a new data set to find the optimal grain value. If the data set is in lat/long (geographic) you will want to make the number quite small. A grain of .01 on Lat/long data stops the "cutting" while retaining the desired detail. With other projections such as UTM you can use larger grain values.

Why do my point symbols import so large?

MAPublisher creates point features using the font size which is currently selected at the time the function (import, point plot etc.) is run. It is generally a good practice to always set your font size prior to importing or plotting points.

Why can't I import .gra files from ArcInfo?

GRA (.gra) files are a graphics file and not an importable GIS data file.

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 top 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 save to a new file as Adobe Illustrator version 5 or EPS file and then exit and re-open. It is not recommended that you save as earlier versions or you will also lose the layers.

What causes missing features when exporting to mid/mif or shapefiles?

If you are using an pre-existing Adobe Illustrator file not created with MAPublisher you must first add map parameters and feature defaults to each layer that you wish to export. If you have added any graphic objects to a MAPublisher map, you must make sure that they are MAPublisher objects to export them. You can test for this by using the SelStats window. If a selected object does not show as a selected feature in the SelStats palette it will not export. You need to run the appropriate Assign Feature Defaults filter to make the objects MAPublisher-aware.

LABELLING 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 and that the features in question are not locked. 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?

Ask your data provider. 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 projection “on the fly”. This is why most files that come from MapInfo or ArcView are stored in lat/long. A good test to see if a file is in lat/long is to look at the anchor values. Look at either the map anchor on import or use the location tool. Typical Lat/Long values will be X between -180 and 180 & Y between -90 and 90.

Why can't I get my file to project properly?

You have to know what projection you are coming from and what projection you are going to, to get your file to project properly. Check with your data provider for this information. The most common cause of the projection editor not performing as expected is that the user has not entered the input or output projection information correctly. Furthermore, it is important to realize that many projections are not suitable for all areas of the world. Make sure to use a projection appropriate for your map.

TABLE ISSUES

What causes Join Tables not to work?

When using the Join Tables filter you should first ensure that the linking columns have similar attribute structures (ie. 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 geo-referencing?

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.

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 A1-17 to A1-19 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 does NAN (not a number) mean?

This mysterious string may show up for the default scale value when you have selected **Defaults**. Usually this will be accompanied by map anchors displayed as INF, which stands for “INFinite”. These results indicate that the numbers in the file being imported are either so large or so small that the software cannot process the file. It is usually indicative of something being seriously wrong with the file that you are attempting to import. You should review your file through a text file editor where possible (DXF, DLG, mid/mif and generate files are all ASCII). Where the source file is Binary (shape and SDTS) check for problems during transfer to their current location.

Why do I have missing data in an ArcInfo Ungenerate file?

If any of the cover–ids are equal to zero, the ArcInfo Ungenerate function ignores the associated graphics and does not include them in the Ungenerate file.

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.

GIS BACKGROUNDER

WHAT IS GIS?

A Geographic Information System (GIS) captures, stores, checks, analyzes, and displays geo-referenced 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…?

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 (ie. 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 after-thought. 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 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.

Viewing "Generalization" Parameters

Viewing "generalization" parameters can be set at any size so that your text will be automatically symbolized by grayed areas for layout (or any other) purposes. This facilitates design and layout and speeds the drawing of highly detailed maps.

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 from 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.

Saving Views

You have the option of saving individual "views" to facilitate editing or viewing defined portions of the map. No more searching around for a particular area that you want to display.

Rulers, Guidelines and Alignment Tools

Border rulers with adjustable guidelines 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

Casual User: 128mb of RAM is recommended.
One who works with MAPublisher with small, polylined data sets with minimal attribute data, a small number of layers and no raster images.

Occasional User: 256mb 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 of RAM or greater 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 10 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.

Some 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.
- If files become too large to work with you can strip out all of the attributes by saving the file as an Adobe Illustrator 5.0 or EPS document. Close the file and then open the new file.
- Many sources of street data include paths/vectors that are segmented based on street addressing information. You can use the MAPublisher Join Arcs 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.
- Use polylined or pre-joined linear feature data sets where available.
- Use the grain feature on import of files to reduce size.
- Do not use more than 3 different fonts for labeling.
- 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).
- 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 15 to 17 & A1-1 to A1-4) 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 Centre 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/index1.html

GISLINX

This site, which has been compiled to provide GIS users with a quick and easy source of information on a variety of issues, has over 1,700 links including many offering GIS data.

- http://www.gislinx.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

USGS

Department of the Interior – US Geological Survey 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.

U.S. Fish and Wildlife Service

The FWS carries the National Wetlands Inventory map data in the USGS DLG format.

- http://www.nwi.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 - Guide to GIS Resources on the Internet

- 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 - The Geographic Information Systems FAQ

- http://www.census.gov/geo/www/faq-index.html

RELATED SOFTWARE AND UTILITIES

All utilities provided listed in this section are either freeware or shareware products and are included on the MAPublisher 5.0 CD with the permission (where required) of their respective developers.

These utilities may be found in the Mac or Windows utilities folder on the MAPublisher 5.0 CD.

MACINTOSH UTILITIES

BBEdit Lite 6.1.2

http://www.barebones.com
BBEdit Lite 6.1.2 is a freeware derivative of BBEdit 6.5, the popular and critically acclaimed text and HTML editor for Web authors, programmers, on-line-service users, and anyone else who needs to edit plain-text files.

GraphicConverter 4.4

http://www.lemkesoft.de/
GraphicConverter is an image editing program that will open and save images in many common graphics formats. It includes editing tools for graphic manipulation and support for Adobe Photoshop plug-ins. GraphicConverter is capable of importing 160 file formats and exporting 45 file formats. Non-English versions are also available at http://www.lemkesoft.de.

MacGzip 1.1.3

http://persephone.cps.unizar.es/general/gente/spd/gzip/home.html
MacGzip is a gzip compressor (GNU zip) for the Macintosh, created by Jean-loup Gailly, ported to Mac by SPDsoft.

MAPublisherTexts

ftp://ftp.avenza.com/pub/misc/MAPublisherTexts.hqx
Microsoft Excel file for calculating the offset values for point data imported using MAPublisher.

StuffIt Lite

http://www.aladdinsys.com
StuffIt Lite is designed to be the simplest, most efficient way to expand compressed files and encoded files that you may have received from various sources. StuffIt Lite includes all 4 of Aladdin's award-winning drag-and-drop compression and access utilities: StuffIt Expander, DropStuff, DropZip and DropTar.

ZipIt 2.2

http://www.maczipit.com
ZipIt is a Macintosh program that zips and unzips archives in a format fully compatible with PKZip for the IBM and zip implementations on other systems. ZipIt is compatible with Mac OS 9.x and OS X.

WINDOWS UTILITIES

Aladdin StuffIt 7

http://www.aladdinsys.com
StuffIt for Windows expands files from the most popular archiving and compression formats found online, including StuffIt (.sit) and ZIP (.zip). StuffIlt will also expand files in uuencoded (.uue), BinHex (.hqx), and MacBinary (.bin) formats, such as those commonly found on the Internet. Other archive formats supported include ARC (.arc), Arj (.arj), and gzip (.gz) as well as self-extracting archives created by StuffIt, ZIP, and Arj.

DLGV32 Pro

http://www.usgs.gov/
Viewer for SDTS DLG, DLG-O and DRG images allowing opening of multiple overlays of multiple types simultaneously. It provides zoom and pan functionality, the ability to find the distance between two points, the ability to pick DLG components and view their attribute codes, and the ability to select an arbitrary polygonal region to clip the overlays to.

HSB Converter 1.2

Courtesy of Ketil Krumm (krumm@online.no).
This is a freeware utility that calculates equivalent RGB values for HSB colour values. It is particularly useful when trying to match colours between ArcView and Illustrator.

MAPublisherTexts

fftp://ftp.avenza.com/pub/misc/MAPublisherTexts.zip
Microsoft Excel file for calculating the offset values for point data imported using MAPublisher.

ShapeChecker

http://www.geocities.com/SiliconValley/Haven/2295
Utility for checking and repairing ArcView Shapefiles.

UltraEdit 9.0c

http://www.ultraedit.com
UltraEdit is a replacement for Microsoft Notepad with support for unlimited file sizes, a 100,000-word spelling checker, full HEX editing capabilities, configurable syntax highlighting for programmers and column editing. UltraEdit handles multiple files at once, even if they are multi-megabyte files. It is disk-based and only requires a small amount of memory, even for very large files.

Winzip 8.1

http://www.winzip.com
WinZip makes it easy for Windows users to work with archives. WinZip features an intuitive point-and-click drag-and-drop interface for viewing, running, extracting, adding, deleting, and testing files in archives with a standard Windows interface. WinZip provides the same “friendly face” for many archival formats. WinZip can handle Zip, TAR, gzip, and Unix compress format files by itself. External programs are required for the less frequently used ARJ, ARC, and LZH formats.

TIPS, HINTS & SUPPORT

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 A1-5 to A1-11, 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. Do not include the quotation marks and substitute your actual email address for <emailaddress>, without the "<" and ">".
- **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. Do not include the quotation marks and substitute your actual email address for <emailaddress>, without the "<" and ">".

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 keycode number 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 A1-23).

- **email:** support@avenza.com
- **online form:** http://www.avenza.com/support.form.html
- **phone:** MAPublisher Maintenance Program Subscribers Only

MAPublisher Maintenance Program (MMP)

With the release of this version of MAPublisher, Avenza has introduced the 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 (+1-905-567-4469)**
- **free MAPublisher updates**
- **free MAPublisher version upgrades**
- **additional discounts and offers available to MMP members only**

If you purchased a maintenance subscription with your MAPublisher 5.0 purchase then you are well on the way to worry-free use of the MAPublisher and will be able to enjoy all the benefits of the MMP immediately.

If you did not purchase an MMP subscription at the time you ordered your copy of MAPublisher 5.0 please be encouraged to do so within 60 days in order to take advantage of the reduced price available. If you wish to purchase an MMP subscription after 60 days from the date of your MAPublisher purchase you will be required to pay the full MMP subscription price.

All MAPublisher Maintenance Program subscriptions begin 10 days after the date of the associated MAPublisher full version or upgrade purchase and run for 1 calender year. MAPublisher Maintenance Program subscriptions purchased after the date of the associated MAPublisher full version or upgrade purchase become retro-active to the date 10 days after the date of the associated MAPublisher full version or upgrade purchase and run for 1 calender year from that date.

Please direct all MMP questions and purchase inquiries to info@avenza.com.

Wishlist

As either a new or experienced MAPublisher user we value you thoughts and opinions on how we can improve our product. Please let us know what you think and what filters or 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

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 the Transform Each 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.

FREE FONTS

On your MAPublisher 5.0 CD you may find a special US National Parks Service font set that contains some very useful cartographic symbols. The font set is also available on our website at http://www.avenza.com/freefonts.html.

There are also other cartographic fonts available from Adobe Systems Inc. which supplies at least three in their Adobe Type Library, Carta, Bundesbahn Pi & Linotype Holiday Pi. Many GIS package also ship with mapping fonts and symbol sets.

Additional TrueType cartographic font sets are available from the British Society of Cartographers web site at http://www.soc.org.uk/software/software.html.

Through the standard Windows or Mac system fonts Dingbat and/or Symbols, you should be able to access some simple boxes and shapes that may be enough for your immediate symbolization needs.

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.
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 Filters ➔ Colors ➔ Blend Vertically and the legend set colours will be blended between the two end extreme colours.
5. You can then select Filter ➔ 3.MAP Legend ➔ Draw Legend Layer to update your map.

Note: You must use one of the Assign Legend filters (pages 57-61) to assign values for the elements in your colour ramp legend prior to running Draw Legend Layer.

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 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 Arcs 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.

GEO-REFERENCING AN ADOBE ILLUSTRATOR MAP 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 geo-reference 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 Map Creation (pages 77-78) before proceding.

These guidelines are for 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 co-ordinate location is known or can be easily determined. Record the location of this point in real world co-ordinates (lat/long or UTM) on a piece of paper.

4. Locate the same tie-in point on the Illustrator document page and determine its X,Y co-ordinates 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 (eg. –79.5, 43.5 in lat/long is located at 4cm, 2cm in the document).

6. Select the layer on which the vector data resides that contains the tie-in point and go to the MAP Creation ➔ Add MAP Parameters filter.

7. Set the Map Anchors to the value of the tie-in location in map units using the values determined in step 3 (eg. –79.5, 43.5).

8. Set the Page Anchors to the value of the tie-in location in page units using the values determined in step 4 (eg. 4, 2).

9. Set the scale to the proper scale of the map (ie. a set distance in document units divided by a set distance in ground units) and set the units in the Add MAP Parameters dialog to the ground distance units (eg. metres). If your data is in lat/long and you do not know the lat/long (non-earth) scale, leave the scale field at the default value, and see the additional notes below. Click **OK**.

The following additional steps are **only** required if the map is being created in lat/long, and you are unaware of what value to enter for a lat/long scale. Lat/long scales are not real world scales. If you have already entered correct anchor and scale values, please skip the following section and continue with step 10.

A. In steps 3 and 4 you determined your first point for geo-referencing your data file (eg. –79.5, 43.5 at 4 cm, 2cm). Now using any symbolisation place a small point here. We will call this POINT 1.

B. To determine a scale in lat/long you will be required to determine and place a second known lat/long reference point within your map document preferably as far from POINT 1 as possible but still within the document extents (eg. –71.5, 46.0). Use a known co-ordinate in the world, either from the raster image you digitized or from an atlas to place a second point. This will be POINT 2.

C. Now with the pen tool, draw a straight line connecting both points.

D. Select this line and go to MAP Creation ➔ Assign Line Defaults.

E. While this line is still selected open the Map Attributes window and write down the value displayed in the "Length" column. This line will be called L1.

F. Now using the Point Plot window place a third point, POINT 3, using the lat/long co-ordinates from step B. This will NOT place a point at the same location as POINT 2 because the scale is still incorrect at this time in the process.

G. Repeat steps C to E using POINT 1 and POINT 3. This line will be called L2.

H. Using your the "Length" value for L1, the "Length" value for L2 and the current default scale as indicated in the Map Location window, perform the following calculation:

True map scale = (Current Scale / L1) x L2

J. Now re-open the Add Map Parameters dialog box and enter the true map scale from step H in the appropriate portion of the dialog and proceed to step 10, below.

10. Repeat Add MAP Parameters for each layer using the Apply Last Filter command or the "or same as" option referencing the intial tie-in layer.

11. Once each layer is geo-referenced, you must geo-reference each object on each layer.

12. Select all lines on the current layer. Select the MAP Creation ➔ Assign Line Defaults. This will make MAPublisher recognize every line on the current layer.

13. Select all areas on the current layer. Select the MAP Creation ➔ Assign Area Defaults. This will make MAPublisher recognize every Area on the current layer.

14. Select all points on the current layer. Select the MAP Creation ➔ Assign Point Defaults. This will make MAPublisher recognize every point on the current layer.

15. Select all text on the current layer. Select the MAP Creation ➔ Assign Text Defaults. This will make MAPublisher recognize every piece of text on the current layer.

16. Deselect all objects and click on the next layer to make it current.

17. Repeat steps 12-15 for this next layer and every other layer until you have assigned defaults to each feature on all layers within your file.

18. You document is now a geo-referenced map wherein each feature is also geo-referenced and capable of accepting attributes using the MAP Attributes functions (see pages 35-42). You can also use the MAPublisher Export functions to create a GIS file from this newly geo-referenced Illustrator map.

TIPS ON EXPORTING TO OTHER GIS SOFTWARE

These strategies do not focus on how to do the procedures, as they are straight forward, but more on what you need to know and understand for successful export results.

Exporting Strategies for Vector GIS Files

First and most importantly you need to understand that the MAPublisher export was designed to export MAPublisher 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 an object was not imported or created by MAPublisher, then MAPublisher does not "know" that it exists. However making the object "MAPublisher-aware" is simple and will solve this problem. All you have to do is use the MAPublisher Assign feature defaults filters to make your non-MAPublisher objects "MAPublisher-aware".

If you have an entire layer that was not created by MAPublisher then:

1. Select the layer in the layer palette.
2. Select Filter ➔ 4. MAP Creation ➔ Add Map Parameters.
3. Select "same as" and choose a valid geo-referenced MAPublisher layer.
4. Click **OK.**

This process "MAPublisher-izes" and geo-references the layer. It is also necessary to follow the next set of steps to make the objects on the layer "MAPublisher-aware".

Note: If the entire drawing is ungeo-referenced with no MAPublisher layers you will need to repeat the Add MAP Parameters steps for all layers and the Assign Defaults steps for all objects on all the layers unless you check the "Apply to all Layers" box in the Add MAP Parameters dialog.

If you have objects that are not created by MAPublisher then:

1. Have the objects in question selected.

2. Optionally you may want to confirm that MAPublisher is not aware of these objects. Select Window ➔ MAPublisher Statistics ➔ SelStats. If they are not MAPublisher objects the SelStats palette will show nothing selected.

3. Assign the feature defaults:

    a) Select Filter ➔ 4. MAP Creation ➔ Assign Area Defaults, for areas.
    b) Select Filter ➔ 4. MAP Creation ➔ Assign Line Defaults, for lines.
    c) Select Filter ➔ 4. MAP Creation ➔ Assign Point Defaults, for points.
    d) Select Filter ➔ 4. MAP Creation ➔ Assign Text Defaults, for text.

Having "MAPublisher-aware" objects is the absolute minimum requirement for a successful export, however there are a couple of additional things to watch for. 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. Select any text that has been created along paths.

2. Select Type ➔ Create Outlines. The text will be converted to vector objects.

3. With the text outline selected, select Filter ➔ 4. MAP Creation ➔ Assign Area Defaults.

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.

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 publically 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 as used in general graphics packages such as Adobe Illustrator. As such you will typically find that curved sections of GIS data (ex. highway ramps) 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 Arcs filter can be used to convert this type of feature into a Bezier curve (see page 86).

If Bezier curves are exported from Illustrator using any of the MAPublisher Export filters they will be converted to link and node topology (ie. 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 add anchor points command within Illustrator (Object ➔ Path ➔ Add Anchor Points).

This version of MAPublisher supports Bezier curve features during the following operations:

- Transform Scale
- Projection Transformation
- Area and length calculations

CREATING A LEGEND TEMPLATE

You can create template files with legends to automate the production of a series of similar maps. The procedure 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 elements from the file and save it to a new template file. Each set of legend elements should remain in its original layer.

3. 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 such as projection and arc-joining.
   c) Drag the legend elements from each original layer to the newly imported layer that has the same features. (ie. road legends would be dragged to the newly imported roads layer).
   d) With the appropriate legend elements selected, select Filter ➔ 3. MAP Legends ➔ Draw Legend Layer for each layer. Your new layer will be symbolized by the previously defined legend elements.
   e) Repeat for each new map.

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

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

Orthophoto 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

The border maps are natural colour photoimage maps. They are available for the U.S.-Mexico border and the U.S.-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 IMAGE

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

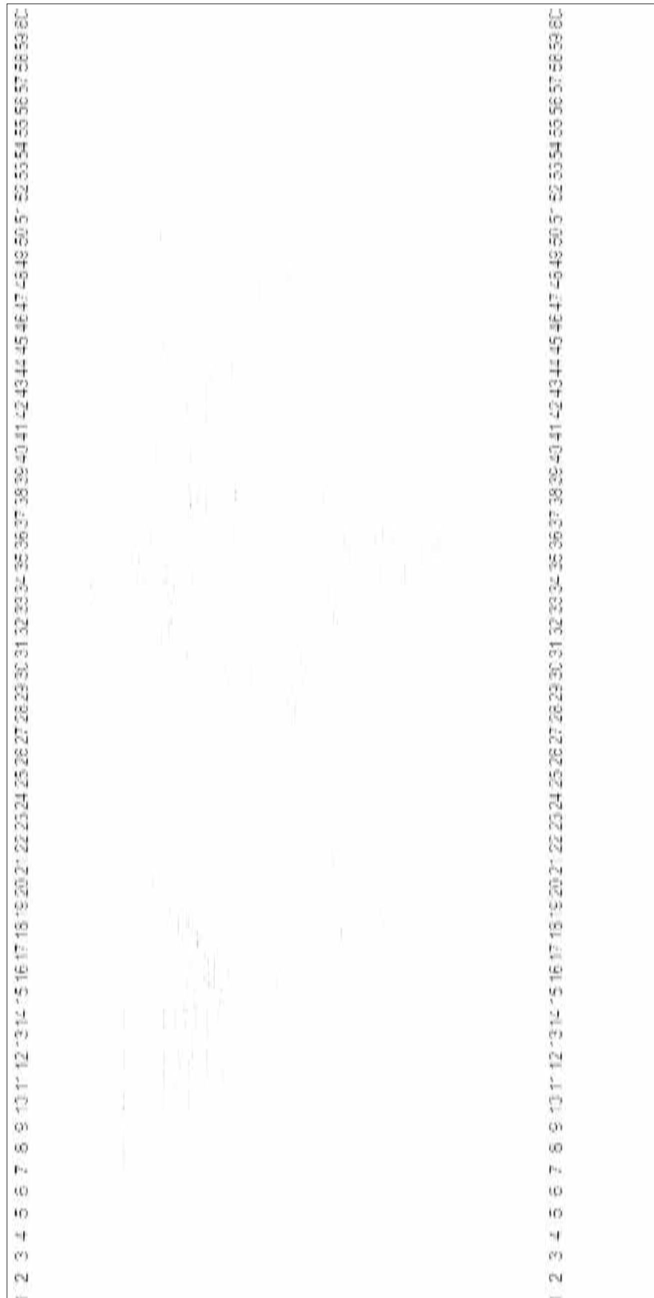
USGS publishes shaded-relief editions of certain topographic maps to accentuate physiographic features of special interest, and for some state, Antarctic, and national park maps. These maps use shaded relief, as well as contour lines, to represent the shape of the terrain.

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 - UTM ZONES

UTM Zone	Central Meridian	Longitude Range	UTM Zone	Central Meridian	Longitude Range	UTM Zone	Central Meridian	Longitude Range
1	177W	180W-174W	21	57W	60W-54W	41	63E	60E-66E
2	171W	174W-168W	22	51W	54W-48W	42	69E	66E-72E
3	165W	168W-162W	23	45W	48W-42W	43	75E	72E-78E
4	159W	162W-156W	24	39W	42W-36W	44	81E	78E-84E
5	153W	156W-150W	25	33W	36W-30W	45	87E	84E-90E
6	147W	150W-144W	26	27W	30W-24W	46	93E	90E-96E
7	141W	144W-138W	27	21W	24W-18W	47	99E	96E-102E
8	135W	138W-132W	28	15W	18W-12W	48	105E	102E-108E
9	129W	132W-126W	29	9W	12W-6W	49	111E	108E-114E
10	123W	126W-120W	30	3W	6W-0	50	117E	114E-120E
11	117W	120W-114W	31	3E	0-6E	51	123E	120E-126E
12	111W	114W-108W	32	9E	6E-12E	52	129E	126E-132E
13	105W	108W-102W	33	15E	12E-18E	53	135E	132E-138E
14	99W	102W-96W	34	21E	18E-24E	54	141E	138E-144E
15	93W	96W-90W	35	27E	24E-30E	55	147E	144E-150E
16	87W	90W-84W	36	33E	30E-36E	56	153E	150E-156E
17	81W	84W-78W	37	39E	36E-42E	57	159E	156E-162E
18	75W	78W-72W	38	45E	42E-48E	58	165E	162E-168E
19	69W	72W-66W	39	51E	48E-54E	59	171E	168E-174E
20	63W	66W-60W	40	57E	54E-60E	60	177E	174E-180E



APPENDIX 3 - DATA LIST

The following is a list of all the files used in the example exercises in this manual.

avg_inc.csv (pages 89, 91, 93, 94 & 95)
ASCII comma-delimited table containing FSA codes and income statistics for downtown Toronto.

az_deci(partial).txt (page 28)
ASCII comma-delimited file containing point data for part of Arizona.

borneo.tfw (page 44)
World file containing registration information for the borneo.tif image.

borneo.tif (pages 44 & 45)
Tiff file of a relief map of Borneo.

burl_roads.lin (pages 41, 60 & 82)
ArcInfo ungenerate file of a few of the major roads, highways and railways of Burlington, Ontario.

canada.shp (page 52)
A shapefile of Canada in Albers Equal Area projection.

eastUS.shp (page 56)
A shapefile of the Eastern United States.

fsatoronto.mif (pages 22, 24, 50, 69, & 91)
A MapInfo file displaying the forward sortation areas (postal zones) of downtown Toronto.

greenland.mif (page 26)
A MapInfo file of Greenland.

hypoint.e00 (page 63)
ArcInfo export file of Alberta containing a series of points and their elevations above sea level.

income.mif (pages 58 & 61)
A MapInfo file of downtown Toronto divided into regions and containing various income statistics.

italy.mif (page 46)
A Mapinfo file of Italy.

regional_south_china_sea.shp (pages 44, 45 & 98)
A shapefile containing a map of the South China Sea and surrounding area.

riverskm.shp (page 87)
A shapefile of major Canadian rivers neighbouring the Great Lakes in kilometer units.

sicily.tif (page 47)
An image of the island of Sicily in tif format.

states.mif (page 51)
A MapInfo file of the United States displayed in a Robinson projection.

toronto.ai (page 77)
An Adobe Illustrator file composed of the torontostreets.mif and fsatoronto.mif data files.

torontostreets.mif (pages 22, 24 & 84)
A MapInfo file containing road data for downtown Toronto.

torontostreets_joined.mif (pages 68, 83 & 85)
A version of the torontostreets.mif file containing road lines that have been joined by street name.

USA.ai (pages 31, 53 & 66))
An Adobe Illustrator file of the United States in Albers Equal Area projection.

world.mif (pages 21, 36, 39, 71, 72, 75 & 98)
A MapInfo file containing a political map of the world with statistical information for each country.

world_east.mif / world_west.mif (page 25)
Two MapInfo files that together form the entire world.mif coverage area.

APPENDIX 4 - UTILITIES LIST

The following utility programs and files are included on the MAPublisher 5.0 for your reference and convenience. They can all be found in the utilities folder.

Windows

DLGV32 Pro (dlgv32_pro.exe)
Program that allows viewing of DLG (SDTS & Optional) as well as DRG images.

e00 Decompression Utility (e00decompress.exe)
Used to decompress ArcInfo Export (e00) files before they can be used in MAPublisher.

GeoTIFF Examiner 1.02 (geotiffe.exe)
This utility is used to create GeoTiff files.

HSB Converter 1.2 (HSBConv.exe)
Utility to convert HSB colour values into RGB colour values.

MAPublisher Texts (MAPublisherTexts.xls)
Microsoft Excel file for computing offset values for point data in MAPublisher.

Mid/Mif Batch Export Script (BulkLayerExport.mbx & BulkLayerExport.str)
A script for MapInfo Professional for batch exporting of mid/mif files.

Mid/Mif Stroke and Fill Patterns (pens_midmif.ai and brushes_midmif.ai)
Stroke and Fill patterns which, when loaded into Illustrator, allow for mid/mif stroke and file styles to be maintained.

MrSID Stand Alone Viewer 2.0.0.50 (MrSIDViewerSetup.exe)
Stand alone viewer for files compressed using LizardTech's MrSID format.

Shapechecker (shapecheck.exe)
Utility for checking the validity of shapefiles.

StuffIt 7 (stuffit7.exe)
StuffIt decompresses a variety of file formats and allows for the creation of compressed file archives.

UltraEdit 9.0c (uedit32l.zip)
Text editor with features such as spell check, HEX editing capabilities and syntax highlighting for a number of programming languages.

Winzip (winzip81.exe)
This utility is a popular compression and decompression program.

Macintosh

BBEdit Lite 6.1.2 (BBEdit_Lite_6.1.2.smi)
A text editing utility that includes a number of enhancements such as syntax highlighting for HTML files.

e00 Decompression Utility (AvzDecompress)
Used to decompress ArcInfo Export (e00) files before they can be used in MAPublisher.

GraphicConverter (GraphicConverter4.4US.img)
An image editing program that supports a wide variety of graphic file formats.

MacGzip 1.13 (MacGzip.1.13)
Another compression utility that can create gzip (.gz) file archives.

MAPublisher Texts (MAPublisherTexts.xls)
Microsoft Excel file for computing offset values for point data in MAPublisher.

Mid/Mif Stroke and Fill Patterns (pens_midmif.ai and brushes_midmif.ai)
Stroke and Fill patterns which, when loaded into Illustrator, allow for mid/mif stroke and file styles to be maintained.

MrSID Stand Alone Viewer 2.0 (MrSID_StandAlone_Viewer_2.0)
Stand alone viewer for files compressed using LizardTech's MrSID format.

Stuffit Lite 6.5.1 (StuffIt_Lite_6.5.1_Install)
Stuffit Lite decompresses a variety of file formats and Dropstuff allows you to create compressed file archives.

Zipit 2.2 (ZipIt2.2.app)
Compresses and decompresses files in the PKZIP format and is fully compatible with implementations of this format on both Macintosh and PC platforms.

APPENDIX 5 - ACKNOWLEDGEMENTS

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Adobe Systems Inc.
345 Park Ave.
San Jose, CA 95110-2704
phone: (408) 536-6000
fax: (408) 537-6000
email: info@adobe.com
web: http://www.adobe.com

Aladdin Systems, Inc.
165 Westridge Drive
Watsonville, CA 95076
phone: (831) 761-6200
fax: (831) 761-6206
email: info@aladdinsys.com
web: http://www.aladdinsys.com

Alain Olivier, Geomatique
Le Buisson
Albiez le Jeune, 73300
Saint Jean de Maurienne, France
phone: +33-(0)4-79643435
fax: +33-(0)4-79643435
email: alain.olivier@geomatique.fr
web: http://www.geomatique.fr

Bare Bones Software Inc.
P.O. Box 1048
Bedford, MA 01730-1048
phone: (781) 687-0700
fax: (781) 687-0711
email: sales@barebones.com
web: http://www.barebones.com

Bentley Systems, Inc.
685 Stockton Drive
Exton, PA 19341
phone: (610) 458-5000
web: http://www.bentley.com

Bridgis / Michael Cappendijk
Sint Walburgkerkpad 3
4001 MG Tiel
The Netherlands
phone: +31-(0)344-636242
fax: +31-(0)344-636246
email: info@bridgis.nl
web: http://www.bridgis.nl

Tom Brown
5325 Elkhorn Blvd., PMB 8091
Sacramento, CA 95842
phone: (877) 597-7271
email: help@maczipit.com
web: http://www.maczipit.com

Dyett & Bhatia
70 Zoe Street, Suite 100
San Francisco, CA 94107
phone: (415) 957-2950
fax: (415) 957-2944
email: info@dyettandbhatia.com
web: http://
www.dyettandbhatia.com

ESRI Inc.
380 New York St.
Redlands, CA 92373-8100
phone: (909) 793-2853
fax: (909) 307-3025
email: info@esri.com
web: http://www.esri.com

eXQte
Sint Janspad 1
4791 HJ Klundert
The Netherlands
phone: +31-168-405932
fax: +31-168-405935
email: info@exqte.nl
web: http://www.exqte.nl

GeoCommunity
4588 East Highway 20, Suite A
Niceville, FL 32578
phone: (850) 897-6778
fax: (850) 897-1001
email: info@geocomm.com
web: http://www.geocomm.com

Ketil Krumm
email: krumm@online.no

Lemke Software
Erich-Heckel-Ring 8a
31228 Peine, Germany
Phone: +49-5171-72200 /
+49-172-9333595
Fax: +49-5171-72201
email:
100102.1304@compuserve.com or
lemkesoft@aol.com
web: http://www.lemkesoft.de

LizardTech Inc.
1008 Western Ave.
Seattle, WA 98104
phone: (206) 652-5211
fax: (206) 652-0880
email: info@lizardtech.com
web: http://www.lizardtech.com

MapInfo Corp.
One Global View
Troy, NY 12180
Phone: (518) 285-6000
Fax: (518) 285-6070
email: custserv@mapinfo.com
web: http://www.mapinfo.com

Louisiana Geological Survey
Louisiana State University
208 Howe-Russell
Baton Rouge, LA 70803
phone: 225-578-5320
fax: 225-578-3662
web: http://www.lgs.lsu.edu

National Parks Service
1849 C St. NW
Washington, DC 20240
phone: (202) 208-6843
web: http://www.nps.gov

Sky Terrain
P.O. Box 808
Boulder, CO 80306
email: kent@skyterrain.com
web: http://www.skyterrain.com

SPDsoft
Jose A Gutierrez
Centro Politecnico Superior
Universidad de Zaragoza
Maria de Luna 3
50015 Zaragoza, Spain
email: macspd@ivo.cps.unizar.es,
web: http://persephone.cps.unizar.es/
general/gente/spd/spd.html

United States Geological Survey
12201 Sunrise Valley Dr.
Reston, VA 20192
phone: (703) 648-4000
web: http://www.usgs.gov

Andrew Williamson
email: andrew_webby@bigfoot.com
web: http://www.geocities.com/
SiliconValley/Haven/2295

XYZ Digital Map Co., Ltd.
40/15 Hardengreen Business Park
Dalhousie Rd.
Dalkeith EH22 3NU Scotland
phone: +44-(0)141-579-0237
fax: +44-(0)141-579-0238
email: sales@xyzmaps.com
web: http://www.xyzmaps.com

APPENDIX 6 - 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.geo.ed.ac.uk/agidict/welcome.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 (or 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.

Arc
A line/vector/path defined by a series of points (a string of X,Y co-ordinates).

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, thought to be 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.

Defaults
The values or actions that would normally be expected to occur.

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, a USGS standard output file format.
These 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 Questions.

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.

Geo-reference
To establish the relationship between page co-ordinates on a planar map and known real-world co-ordinates.

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 geo-referencing 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 center 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 geo-referencing 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 behavior 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 Arcs
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 co-ordinates of the data files.

Map Co-ordinates
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 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

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/arc defined by a series of points (a string of X,Y co-ordinates).

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 co-ordinates. 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 recognised 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, geo-referencing, 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 organised 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 Co-ordinates
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 (lines, arcs) 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 the Province 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 or artwork. One method of data type, used to store spatial data. Vector data is comprised of lines or arcs, 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 co-ordinates. 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 co-ordinate 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 co-ordinates that constitute a line. A points representing spatial X,Y co-ordinates that occur along an arc 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 4.0 does not support VPF files.

W

World file
A file associated with an image that contains geo-referencing 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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