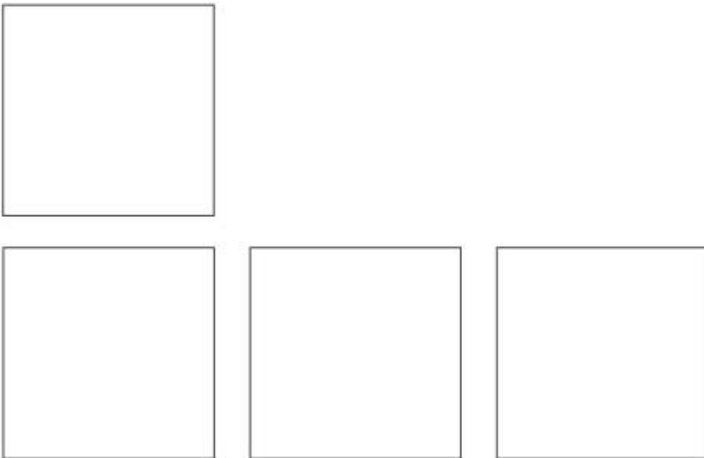




GBM Pro

User Manual

Second Edition for GBM Pro V2.10



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Licensing

GBM Pro may be installed and operated only under the terms of the GBM Software end user license agreement shown in Appendix I of this document.

Contact your local GBM Software reseller to license the software and obtain a license key. Customers who do not have a license key are permitted to install and operate the software for 30 days under an evaluation license to allow them to establish whether the software is suitable for their purposes.

Version History

Edition	Date	Comment
First Edition	June 2009	For GBM Pro V1.51
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Contact Details

Sales and upgrade enquiries should be directed to your local GBM Software Reseller or direct to Exa-Min Technologies at the address below. Check the Exa-Min Technologies website (www.geobasemap.com) for reseller contacts, updates, technical bulletins and other support materials.

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Glossary

Term or Abbreviation	Description
GBM	A software solution suite by Exa-Min Technologies.
GIS	Geographic Information System
MapInfo®	A GIS solution owned by Pitney Bowes
UMPC	Ultra Mobile PC
PDA	Personal Digital Assistant
CD	Compact Disc
PC	Personal Computer
ODBC	Open Database Connectivity
GPS	Global Position System

1 Welcome

Thank you for choosing GBM Pro from Exa-Min Technologies. This document details instruction on how to install, configure and get the most out of using GBM Pro in MapInfo Professional®.

Topics in this Section

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1.2. How to use this Manual	2
1.3. Supporting Documentation	2
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1.1. Audience

This manual is intended as both a learning and reference tool for all users or administrators of MapInfo Professional® using GBM Pro.

1.2. How to use this Manual

The contents of this manual have been developed to cater for both new and experienced users of GBM Pro. If new to GBM Pro or a novice in MapInfo Professional®, it is highly advisable to read the entire contents in order to gain the best understanding of how GBM Pro is used.

For more experienced users, use Chapter 4 as a reference on how to perform particular tasks on GBM Pro Custom Forms.

1.3. Supporting Documentation

Additional GBM Pro training and support material is made available through the Exa-Min Technologies website (www.geobasemap.com). More detailed information on GBM Custom Forms is presented in the GBM Mobile User manual that may be downloaded from the above web site.

1.4. Assumed Knowledge

For systems administrators, a good working knowledge of Microsoft Windows and how to install or remove software is required. Users responsible for configuring GBM Pro projects should be familiar with high level concepts and usage of MapInfo Professional®.

Once projects have been configured in GBM Pro for general use, the prerequisite knowledge of MapInfo Professional® is below the level of training commonly required to run MapInfo Professional® in its native form.

This document does not attempt to explain MapInfo Professional® concepts or operation. Please refer to your MapInfo Professional® support documentation if seeking clarification on that product's usage or technology.

1.5. Document Layout

This guide is designed for a range of different user roles and not all procedures covered herein would be applicable to any particular role. The reader is therefore advised to make themselves familiar with the layout and structure of this document's contents.

The chapters contain the following:

- Chapter 1- Provides an overview of how to use the GBM Pro manual and where to find help.
- Chapter 2 - Is an overview of the GBM Pro product and its features.
- Chapter 3 - Provides software installation and removal instructions.
- Chapter 4 - Provides details of how to use GBM Pro in MapInfo Professional®.
- Chapter 5 - Provides information on Managing GBM Custom Forms
- Chapter 6 - Provides more detailed information on building GBM Custom Forms
- Chapter 7 - Provides a guide on how to troubleshoot common issues with GBM Pro.

Other supporting information includes an Index at the back of this guide and a table of Acronyms or commonly referenced terms which can be found on page vii.

1.5.1. Document Conventions

The information provided in this guide uses the following conventions:

- **Tasks or Processes**

Instructions which a user is required to perform during a task are always represented as a numbered sequence. For example:

1. Enter the data into the "Contents" field.
 2. Click "OK"

- **Notes or Hints**

Reference to issues of importance or hints on best practice methods are expressed by the prefix "Note:" or "Hint:" respectively. For example:

Note: The "Item" button will be hidden if the wrong object type is selected

- **User Controls**

User controls (i.e. fields, buttons, menus etc.) found on computer system user interface screens are always referenced within quotes. For example:

Click on "Cancel" to close the form and discard your changes.

- **Keyboard Commands**

Items that reference specific keyboard keys are shown using capitals. Combination key presses are delimited by the plus character (+), whereby each specified key should be held whilst pressing the next key in the sequence. For example:

Type the values into the provided field and then press the ENTER button.
To open the options dialog press SHIFT+F3

1.6. Getting Help

Exa-Min Technologies has designed GBM Pro to be as user friendly and intuitive to use as possible. We pride ourselves in supporting our customers in all aspects. When encountering an issue, the following resources are available to help our users:

- The electronic PDF of this document contains a Search feature which should be used to find information regarding the issue.
- On-line help is available from within MapInfo Professional® by selecting "Help" from the GBM Pro menu.
- Visit the Exa-Min Technologies website at www.geobasemap.com and click on the "Support" link from the home page. There are a range of support materials available on the site including videos, FAQs and supporting documents.
- Contact your reseller or Exa-Min Technologies using the details on page iii of this guide.

2 Product Overview

This chapter provides an overview of how GBM Pro works to bring powerful new features to MapInfo Professional® and give users the means to work more effectively than ever.

Topics in this Section

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2.3. An Introduction to Custom Forms	6
2.4. The GBM Software Suite	9

2.1. What is GBM Pro

GBM Pro is a MapInfo Professional® add-in intended for users who want to control the quality of their MapInfo data and need to link different sets of attributes to the same map features.

Adding GBM Pro elevates MapInfo Professional® to an enterprise level solution that recognizes the business context and editing constraints for each data set. GBM Pro will greatly assist corporate data managers in ensuring data quality and consistency whilst reducing IT overheads through more efficient data preparation and clean-up.

Using GBM Pro will improve accessibility of corporate data and lower associated training costs.

2.2. What's New

This release of GMB Pro makes it easier to enforce consistency and data quality across workgroups using MapInfo Professional®. The core features of GBM Pro which enhance MapInfo Professional® include:

- Custom Forms - for ensuring easier and more consistent data entry.
- Support for One-to-Many Relationships - for linking multiple data items to a single map feature.
- A Graphic Styles Library - for ensuring consistent map graphics.

See the sections below to read more about each of these features and how they can help you improve efficiency, productivity and enhance the overall user experience in MapInfo Professional®.

2.3. An Introduction to Custom Forms

GBM Pro introduces a Custom Form feature to MapInfo Professional® which is a graphical user friendly and intuitive way to present and manage feature data in MapInfo Professional®.

With the powerful Custom Forms of GBM Pro, any experienced MapInfo® operator can now easily and quickly create or tailor input forms for map features using configurable drop down lists, validation limits, code table lookups or automatic values populated from GIS queries.

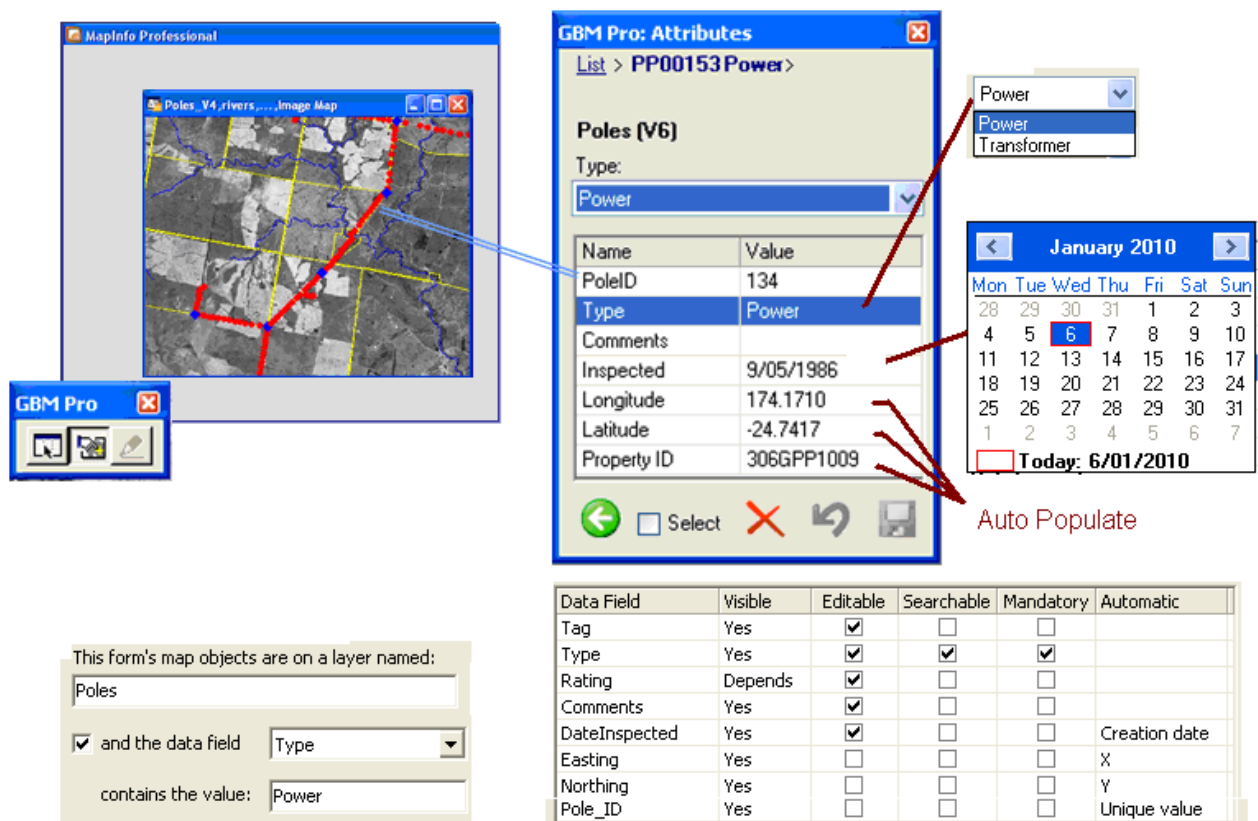


Figure 1 - GBM Custom Forms.

2.3.1. Managed Data Edits

Effective GIS data management can now be achieved without needing to know about the in-depth workings of MapInfo Professional®. Custom Forms not only make working in MapInfo Professional® easier, but they can also assist in mitigating the challenges and risks associated with traditional means of editing or managing data. Common issues of concern for users and data managers include:

- Reluctance in providing MapInfo Professional® users with edit rights for fear that data will be corrupted.
- Editing errors caused by inconsistent and inaccurate data entry can degrade the data asset and disrupt corporate systems that share MapInfo® data.
- Each workgroup within an organization may describe a particular feature in a different way, thereby compromising data consistency and reducing the value and use of organizational datasets.

Custom Forms address all these concerns. Editing can be controlled through drop down lists and date pickers and numeric range checks. Extended field descriptions and editing prompts ensure consistent interpretation of data across an organization.

GBM Pro helps data managers maintain consistent data sets with fewer errors by easily configuring aspects such as data field visibility, access rights, editing rights and value definitions. Data edited through Custom Forms is validated at the point of entry thereby ensuring that inadvertent edits don't corrupt corporate data.

2.3.2. One-to-many Data Relationships

GBM Pro supports one-to-many relationships, allowing multiple data items to be linked or associated with a single map entity.

For example, an asset may be inspected and repaired many times during its lifecycle. A street tree may be inspected on a yearly basis. Each year the data collector will capture information regarding the height of the tree, condition of the tree and so forth. This data collection is repeated on a regular basis and the challenge is how to effectively store the multiple data series against that single asset.

Regular data collection does not easily fit into the simple tabular data tables supported by MapInfo Professional®. A common workaround is to duplicate the spatial feature during each data collection so that each database record is represented on the map. Duplicating spatial features complicates data updates and adds extra map layers which in turn degrade performance. Data management is complicated as there may be multiple conflicting points of truth for a single spatial feature.

With GBM Pro, a user can click on a map outline and open a list of associated records. The map database will only need one copy of the spatial outline (see Figure 2) which can then be linked to multiple other data tables.

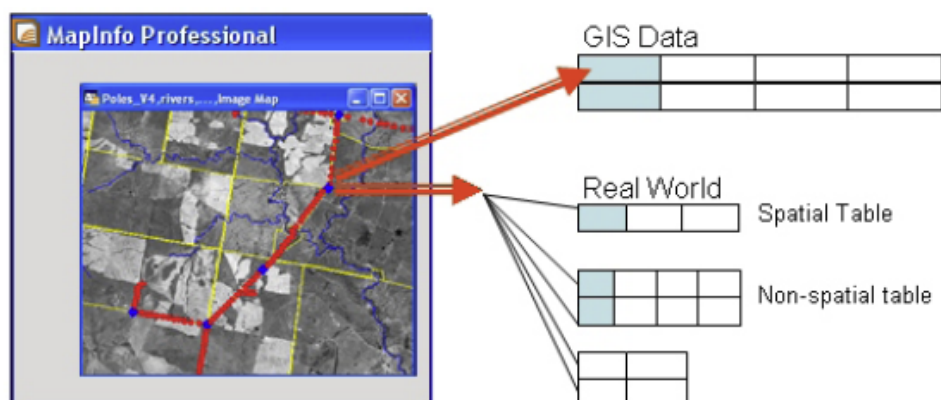


Figure 2 - Linking multiple records from different tables to a single map feature.

In the example of a data collector performing tree inspections, the details of each year's collection can be stored individually but linked to the same map object in MapInfo Professional®.

This hierarchical relationship is established in the form manager and will work with any data set that MapInfo® can read, including standard ".tab" files and linked database tables. Linked tables do not need to include a spatial feature and may therefore reside in standard databases that may otherwise not support spatial data.

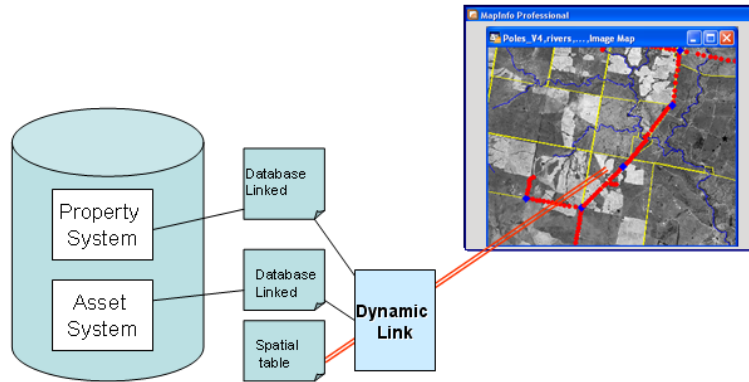


Figure 3 - Database linking.

GBM Custom forms are supported across the GBM Software Suite giving organizations the means to work effectively and consistently across office and field environments.

2.3.3. Graphics Style Library

GBM Pro enables users to embed a library of graphical styles within the custom form definitions. This library ensures consistency in presenting map items and improves the efficiency of map production.

In its standard form there are no automated controls within MapInfo Professional® to synchronize a feature's map presentations with its data values. Operators tend to manually set graphical styles when drawing a feature, which can be a laborious and error prone process. The challenges of manually creating and managing graphical features include the following:

- Consistently applying the right graphical style to each map feature can be difficult to achieve, especially when working across different work groups within an organization.
- When MapInfo® data is translated into other formats or read from a shared database by third party programs, graphical styles are often lost. If the graphical style is the only way to distinguish feature types then the data cannot be shared effectively.

GBM Pro provides a graphical styles library similar to that offered by CAD or other design systems. Graphical features can be created once and referenced or used multiple times without having to duplicate instances. The benefits of working with a graphics style library include:

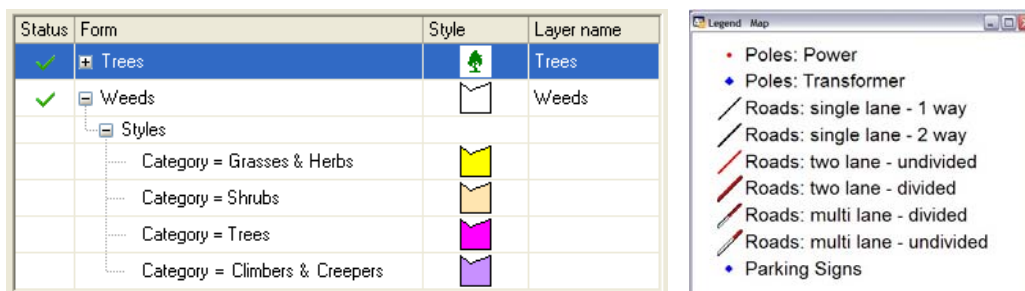


Figure 4 – Map legends

- Graphical styles are linked to the data attributes of each map feature. This means that third party programs (such as CAD and GIS systems) that share the data can reliably use these feature codes to draw consistent maps.
- Graphical styles are automatically updated when data attributes are edited through Custom Forms thereby ensuring that maps and tabular data presentations are always consistent.
- The GBM Pro custom forms hold a graphical display library that links data values with map style therefore ensuring that the library of graphical styles is immediately available to all users.
- Consistent and fully attributed legends can be drawn automatically.

2.4. The GBM Software Suite

The GBM Software Suite combines robust mobile mapping and data collection software with management tools to provide a complete field and office data solution.

The Complete Enterprise GIS Data Management Solution

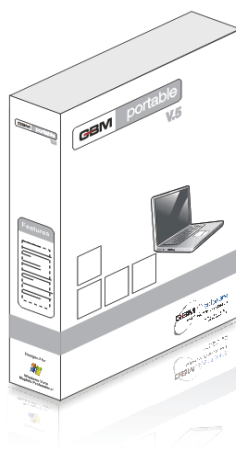


GBM Pro

Take control of your GIS data management using GBM Pro for MapInfo Professional®.

Configure items such as custom forms and map graphics libraries then share them seamlessly between field operators running GBM Mobile or GBM Portable.

GBM Pro is the premier office solution to managing and controlling your geospatial data collection and management across the enterprise.

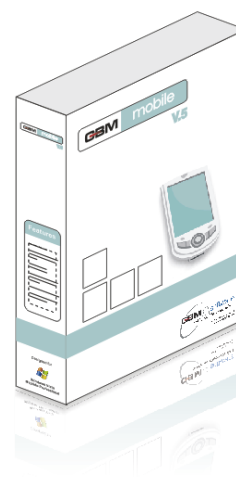


GBM Portable

Delivering mapping and data entry capabilities on PC systems that parallel the environment that GBM Mobile delivers to PDA users.

GBM Portable supports full GIS mapping, GPS integration and the same custom forms capability as GBM Mobile.

GBM Portable is the ideal system for mobile operators using notebook, tablet PCs or Windows Ultra Mobile (UMPC) devices.



GBM Mobile

An out-of-the-box mobile mapping and data collection solution operating on Windows Mobile (PDA) hardware.

GBM Mobile combines mobile GIS mapping with user customizable data entry forms.

GBM Mobile supports GPS units as well as cameras and is ideal for mobile operators who need to navigate to field locations and view or collect information about assets at those locations.

Figure 5 – Standard GBM Software Products

3 Installation

This chapter provides details on how to install or uninstall the GBM Pro add-in.

Topics in this Section

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3.2. GBM Pro Installation.....	12
3.3. Uninstalling GBM Pro	13

3.1. System Requirements

GBM Pro is a Microsoft .NET component which is bound into MapInfo Professional® through MapBasic®. To run GBM Pro your system must support the minimum system requirements which are set for MapInfo Professional®.

Note:

1. GBM Pro operates with MapInfo Professional® V7.0 or later. Users must separately license and install MapInfo Professional®.
2. GBM Pro can only operate with a single MapInfo Professional session on each workstation. Close down multiple MapInfo Professional sessions before starting GBM Pro.

3.2. GBM Pro Installation

GBM Pro can be installed under a standard license or a 30 day evaluation license.

Before following the instructions in this section please ensure that your system meets the minimum requirements set out in section 3.1 above and that you login has Windows administrator level privileges and that MapInfo Professional (V7 or later) has been installed.

To install GBM Pro:

1. If MapInfo Professional® is operating, close it before starting the GBM Pro installation.
2. Depending on the installation medium, the GBM installer can be started in the following ways:
 - 2.1. If you have a GBM Pro installation CD, insert the disc into your PC. The installer should start automatically. If it does not run automatically run "Setup.exe" which can be found in the root folder of the CD.
 - 2.2. If you have downloaded the package as a (.zip) file, unpack all files into a temporary directory then locate and run the "setup.exe" file.
3. The GBM Installer will be presented. Click "Release Notes" for information about the latest software release.
4. From the GBM Installer, click on the "Install Software" option.

The GBM Pro Installation script will start and display the Welcome screen. From here it is possible to stop installation by clicking the "Cancel" button on any of the installation screens.

5. From the Welcome screen, click on "Next".
6. Read the license details and click on "Accept" to continue.

From the Installation Licensing screen, select the required installation type, then enter "Name" and "Company" details into the provided fields. Click "Next" to continue.

- 6.1. If "Standard Installation" was selected in the previous step, enter your license key into the provided field, then click "Next" to validate the license key and continue the installation. License keys are issued through GBM Software resellers.
- 6.2. If "30 day evaluation" was selected in the previous step, click on "Next" to continue. This type of license times out 30 days after initial installation.
- 6.3. If you initially install the software under a 30 day evaluation license and subsequently acquire a standard license and license key, uninstall and reinstall the software to deactivate the evaluation timer.
7. From the Application Folder screen, enter the installation path into the "Destination Folder" field, then click "Next" to continue.
8. The installer will now try and locate the installation of MapInfo Professional®. Click on "Next" if the displayed location of MapInfo® is correct.

If MapInfo® can not be found:

- 8.1. The installation will prompt for the MapInfo Professional® location path. Point to the installation path and then click "Next" to continue.
9. Click on "Install" to start the installation process.
10. At the Finished screen, click on "OK" to finalize the installation.

The installation automatically registers the GBM Pro MapBasic application (GBMPro.mbx) for auto loading through the MapInfo Professional® tools function. To verify correct installation, start MapInfo Professional®. The "GBM Pro" menu should be visible as an option on the main MapInfo® menu bar (see Figure 6).

You may enable or disable auto loading through the standard MapInfo Professional "Tools" menu. GBM Pro will appear on the main MapInfo Professional menu bar once it has been loaded.

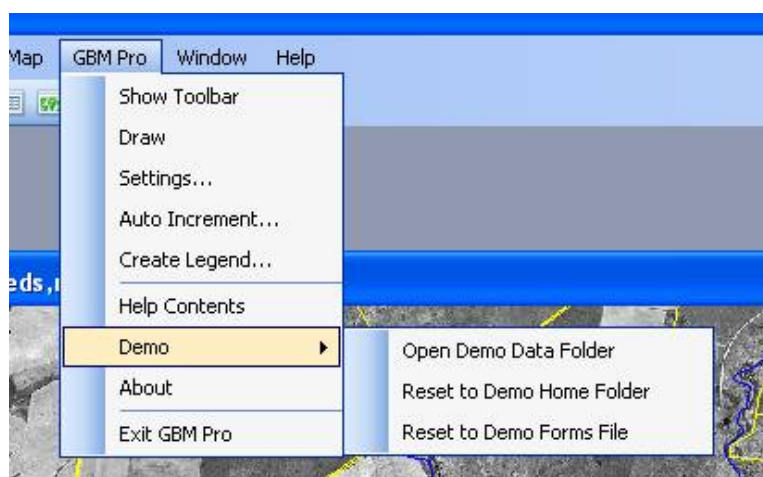


Figure 6 - GBM Pro menu in MapInfo Professional®

Demonstration projects are loaded onto each PC as part of the GBM Pro installation procedure. This demonstration data can be accessed through the GBM Pro menu.

3.3. Uninstalling GBM Pro

Uninstalling GBM Pro does not affect MapInfo Professional® and any ".tab" files or geospatial map features created on the host system using GBM Pro will remain. Custom forms however will no longer be visible once the software has been removed.

To uninstall the product:

- Open the Windows Control Panel

In Windows XP:

- Choose "Programs and Settings" and double-click the "GBM Pro" entry.

In Windows Vista:

- Choose "Programs and Features" and double-click the "GBM Pro" entry.

4 Working with GBM Pro

This chapter provides details of how to perform common tasks using GBM Pro from within MapInfo Professional® and demonstrates how the product functionality can be used to enhance your MapInfo® experience.

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4.1. Getting Started

This chapter provides an overview of GBM Pro operation including instructions on how to select a project and work with GBM Custom Forms that have been imported into that project.

Prior to starting the instructions in this section, please ensure that you have installed GBM Pro as described in chapter 3. GBM Pro comes with two sample workspace files and projects which are pre-configured with custom forms. The examples in this section use the "Road Corridor Project" sample data.

Refer to chapter 5 for more detailed information on using the forms editor to design customer specific Custom Forms.

4.2. GBM Pro Projects

GBM Pro uses the term *Project* in the sense of a file system storage area where Custom Form files and other resources that define the current working environment are stored.

Project folders are managed through the Custom Forms Settings window.

Note:

11. Only those Custom Forms that have been imported into the current project (and therefore reside in folder associated with the current project) are active in a GBM Pro session.
12. Custom Forms are associated with map layers in MapInfo Professional®. Custom Forms only operate when the active MapInfo Mapper window includes a map layer with the layer name referenced in the form definition.

4.2.1. Opening the Demonstration project

This presentation is illustrated using the demonstration data that is installed with GBM Pro. Before proceeding please open the demonstration data set and activate the corresponding GBM Pro project.

Open the Demonstration Maps

Open the demonstration workspace "Road Corridor Project.wor". The workspace will have been installed in the demo data folder that can be opened through the following menu sequence in your MapInfo session.



Double click the workspace file in Windows Explorer.



Two Maps (MapInfo Mapper Windows) will open.

Set the Active project

GBM Pro allows users to select a home folder that contains one or more project folders, each containing the configuration files for a single project. Selecting a project will activate the Custom Forms that have been imported into the associated project sub-folder.

1. Select "Settings" from the GBM Pro Menu. The GBM Pro Custom Form Settings window will open (see Figure 7).

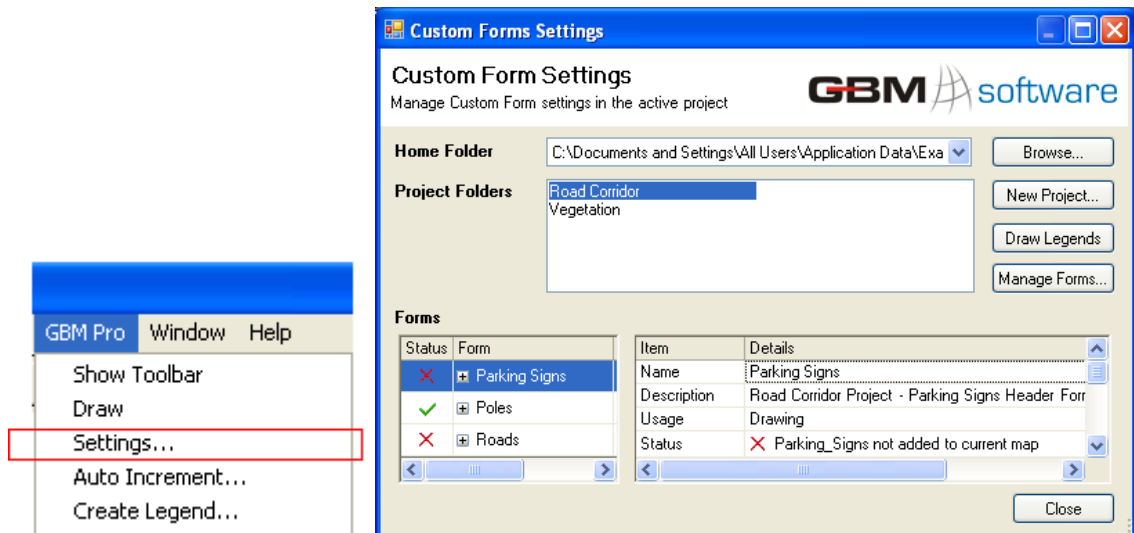
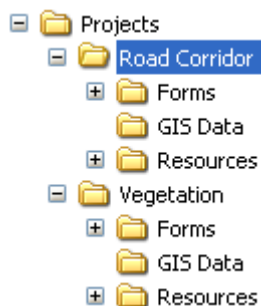


Figure 7 - GBM Pro Custom Form Settings window.

In the above screen the “Home folder” has been set to be the demonstration data folder. The Home folder contains two sub-folders (Road Corridor and Vegetation) that each contain a different set of GBM Custom Forms files.



If necessary reset the home folder to be the folder containing the demonstration data. The demonstration data can be found in the following location:

If using Windows XP:

C:\Documents and Settings\All Users\Application Data\Exa-Min\GBM Demo Data\GBM Pro\Demo Data

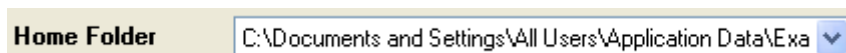
If using Windows Vista:

C:\Users\Application Data\Exa-Min\GBM Demo Data\GBM Pro\Demo Data

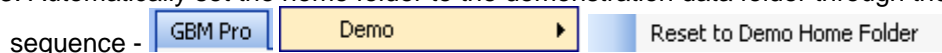
The “home folder” can be set in three ways:

12.1. Click "Browse..." from the Custom Form Settings window. You will not be able to browse to the demonstration data folder if Windows Explorer is configured to “Show hidden files and folders”. The other two options will always be available.

12.2. Choose a home folder from the drop down list



12.3. Automatically set the home folder to the demonstration data folder through the following menu



13. Click on the required project folder to highlight and set it as the active project. For this presentation, choose the “Road Corridor” project



14. Review the status indication of all forms. The screen will list all Custom Forms that have been imported into the current project. Only forms marked with a green tick are currently active.

Status	Form	Style	Layer name
✗	+ Parking Signs	◆	Parking_Signs
✓	+ Poles	●	Poles
✗	+ Roads	—	Roads

In this example only the Poles form is available as the Poles layer is the only layer that is targeted by a GBM Custom Form and is open in the current MapInfo Map Window. If the Map Window containing the layer "Parking_signs" and "Roads" was active when the Settings screen was opened, then the Poles form would have been marked with a red cross while the other two would have had green ticks.

To see more information on the status of a form, click on it in the list and review details in the right hand panel. These details are discussed below.

4.2.2. Reviewing Custom Form Settings

Before working on any map using GBM Pro, it is highly advisable to review the Custom Form settings for the active project. The Custom Form Settings window contains easy to view details of which forms are available for use.

To view custom form settings:

15. Ensure the GBM Pro Custom Form Settings window is open, and that the required project is selected. Figure 7 above shows the "Road Corridor" demonstration project.

Observe how the list in the lower left of the window displays the custom forms associated with the selected project and the list on the right shows the attributes of the selected Custom Form.

Note: An important attribute to monitor is the "Status" row in the "Forms" list. The status indicates which custom forms are available for use. In the example shown in Figure 7, only the "Poles" form is operational (as indicated by the green tick).

16. Click on the "+" icon next to the "Poles" form entry.

The forms are presented as a hierarchical tree which can be expanded or collapsed using the "+" or "-" icons next to each branch.

Status	Form	Style	Layer name
✗	+ Parking Signs	◆	Parking_Signs
✓	- Poles	●	Poles
	- Styles		
	Type = Power	●	
	Type = Transfo	◆	
	- Sub Forms		
✓	Pole Inspector		Poles_Inspections
✗	+ Roads	—	Roads

Figure 8 - Custom forms list showing the expanded "Poles" form.

Figure 8 shows that the "Poles" form can be used to draw Power Poles (red dots) and Transformer Poles (blue diamonds). There is one linked sub-form for Pole inspections. Inspections are linked from a second MapInfo ".tab" file to allow recording of multiple inspections for each pole.

17. Click on "Close" to hide the GBM Pro Custom Settings window.

Only forms that have been imported into the active GBM Pro Project are active in a MapInfo Professional® session. Please refer to Chapter 5 for detailed instructions on defining GBM Custom Forms and importing them into the current project.

4.2.3. User Interface Details

This section provides more detailed information about each of the controls on the the Custom Forms Settings window

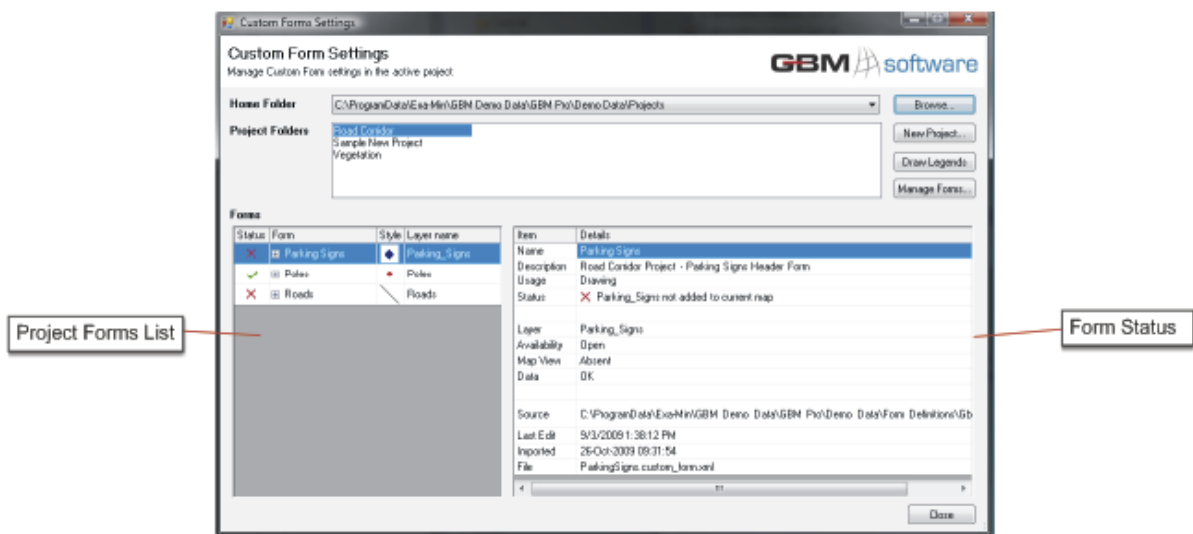


Figure 9 - Custom Form Settings window.

The Custom Form Settings window has the following elements:

Field Name / Control Type	Details
Home Folder Drop-down	Selects the Home Folder directory for GBM projects. When clicked, shows a selectable history of previous folder locations.
Browse Button	Opens a Windows Explorer dialog for selecting the Home Folder.
Project Folders List-box	Displays and selects the active project. The entries are sub-folders of the specified "Home Folder" and contain the custom forms shown in the "Forms" list.
New Project Button	Opens the "New Project" window.
Draw Legends Button	Opens a Windows Explorer and prompts for a filename for the legend.
Manage Forms Button	Opens the "Mange Forms" Window.
Project Forms List List-box	Displays the list of Custom Forms that are part of the project selected in the "Project Folders" field. The information shows:

Field Name / Control Type	Details
	<ul style="list-style-type: none"> • Status - Shown as "Unavailable" (red "x"), or "Available" (green "✓"). See the "Status" row in the "Form Status" List-box to see more detail if form is unavailable. • Form - Displays the name of the custom form and allows for the viewing of any of its child custom forms. Click on "+" icon to expand or "-" icon to contract branches in the tree. If the custom form has a graphical style that depends upon the value of a field in the TAB file, then there will be a "Styles" child node sitting under custom form node and under the "Styles" node will appear nodes that list the field and the value of that field for each of the graphical styles associated with the custom form. The "Style" column will show the graphical style. • Style - Displays the graphical style for the selected form. • Layer Name - Displays the name of the layer on which this form can be used.
Form Status List List-box	<p>Displays various attributes of the Custom Form which is selected in the "Project Forms List" panel. Information provided contains:</p> <ul style="list-style-type: none"> • Name • Description • Usage - Can be either: <ul style="list-style-type: none"> ○ Drawing - available for creating new spatial features on the map. ○ Linked - the custom form is a child custom form and it can only be used for editing attributes, not for creating map objects. ○ Reference – the custom form is used only to display attributes of a map object and these cannot be edited • Status - Displays more detailed status information about the selected form. • Layer - The name of the layer on which this form can be used. • Availability - Displays "Open" if part of the current project. • Map View - Displays "Absent" if not shown on the current mapper or "selectable" if used and shown on the map. • Data - Displays as either: <ul style="list-style-type: none"> ○ "OK" ○ "The TAB file is set to read only in the header file" - GBM Pro will not be able to write data to the TAB file. ○ "The data files are read only" - the TAB file is marked as read-only in the file system and GBM Pro will not be able to write data to it. ○ "Layer not open – data cannot be checked" - The layer is not in the mapper and the information about the TAB file fields contained in the custom form cannot be validated against the actual fields in the TAB file. • Source - Shows the name and path of the shared form file where the form was imported from. The shared form file is the master file that can be edited by the forms editor. • Last Edited - Displays the date and time the form was last edited. This is the edit date of the entry in the master form definition file when the form was imported into the current project. • Imported - Displays the date and time the form was last imported into this project from the master forms file. • File - Displays the name of the form definition file in the current project.
Close Button	Closes the Custom Form Settings window.

4.2.4. Setting the Home Folder

Projects are stored as folders in a directory structure on the file system. Users may nominate a projects folder of their choice. Each sub-folder of the home folder contains a separate GBM Pro project.

To set the Home Folder:

1. Open the Custom Forms Settings window by selecting "Settings" from the GBM Pro menu (see Figure 7).
2. Click the "Browse" button from the settings window to select a new location for the home folder.

Note: It is the sub-folders of the selected home folder which list as GBM Pro projects.

4.2.5. Creating New Project Folders

Project folders are selected or created from the Custom Forms Settings window.

To add a new project:

1. Open the Custom Forms Settings window by selecting "Settings" from the GBM Pro menu (see Figure 7).
2. From the Custom Forms Setting window, click on the "New Project" button.

The Create New Project Folder window is displayed (see Figure)

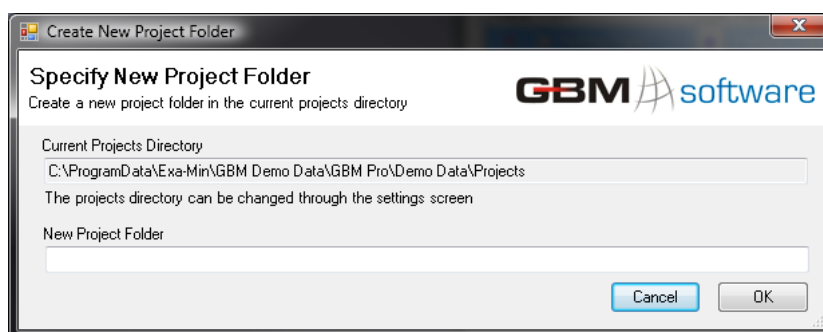


Figure 10 - Create New Project Folder window.

3. Enter a name for the project in the "New Project Folder" field, then click "OK".
This will create an empty project which is ready for creating or importing custom forms.

See Chapter 5 for information about building forms for use in GBM Pro projects.

4.2.6. Deleting Project Folders

Project folders which are no longer required need to be manually removed on the storage device.

To delete a project folder:

1. Open a Windows Explorer and navigate to the GBM Pro Home Folder.
2. Highlight and then delete the required folder. This will permanently remove all forms and settings for the project.

4.3. Editing Map Data

Graphical items on a map are edited through the Attributes tool, which is accessible from the GBM Pro toolbar.

To explore map data:

1. To use demonstration data, ensure that the "Road corridor Project.WOR" workspace file is open and the maps are visible.

2. Select "Show Toolbar" from the GBM Pro Menu.

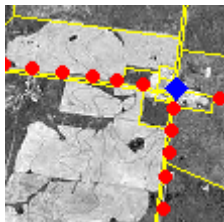
The GBM Pro Toolbar is displayed (see Figure). There are three buttons on this toolbar (the Drawing Window, the Attributes Tool and the Drawing Tool).



Figure 11 - GBM Pro Toolbar, highlighting the Attributes Tool.

The Attributes Tool is used to view or edit data attributes associated with a map feature and behaves in a similar manner to the MapInfo Professional® Info tool.

3. Click on a map feature using the Attributes Tool to show the Custom Form for that feature and edit its data. If using the demonstration project, click on a power pole (red dot).



A Custom Form opens, showing the selected feature's data attributes (see Figure 12).

GBM Pro: Attributes

PP00172 Power >

Poles

Enter a maximum of 7 characters

PP00172

Name	Value
Tag	PP00172
Type	Power
Comments	
Inspected	9/05/1986
Longitude	174.1850
Latitude	-24.6997
Pole Id	142

Pole Inspection

- 9/05/1986
- [New](#)

Navigation icons: Back, Select, Delete, Undo, Save

Figure 12 - Map feature Attributes window.

Controls commonly presented on the Attributes window are:

- A navigation history strip (also commonly known as a cookie crumb) along the top of the window,
- a "Back" button in the lower left,
- a "Select" arrow,
- a "Delete" button,
- an "Undo" button, and
- a "Save" button.

The way in which this data is displayed and the controls on how it can be edited have been set in the GBM Custom Form Manager and is not covered here. Refer to Chapter 6 for details on setting up Custom Forms.

4. If using the demonstration data, click on the blue hyperlinked entry marked "9/05/1986" from the "Pole Inspection" section as shown in Figure 12.

The Attributes window will be re-presented to show data the map record (see Figure).

Section 6.8 discusses linking secondary data tables in hierarchical relationships in more detail, but for this example it is sufficient to understand that there is a pole inspection record linked to the power pole that is shown on the map.

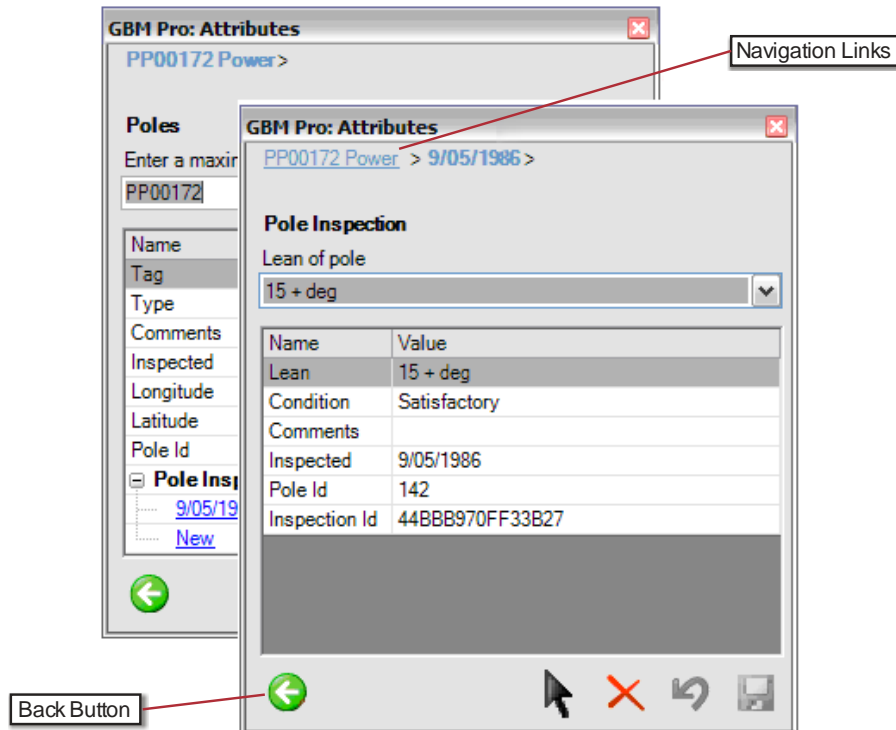


Figure 13 - Linked data attributes.

- To return to the main form from a linked record, either click the green back button at the bottom of the form or the blue "cookie crumb" navigation links along the top.

4.3.1. User Interface Details

The Custom Forms Attribute window is used to display or edit a Custom Form for the selected map feature. The window appears when a feature is selected using the GBM Attributes Tool or drawn with the GBM Drawing Tool.

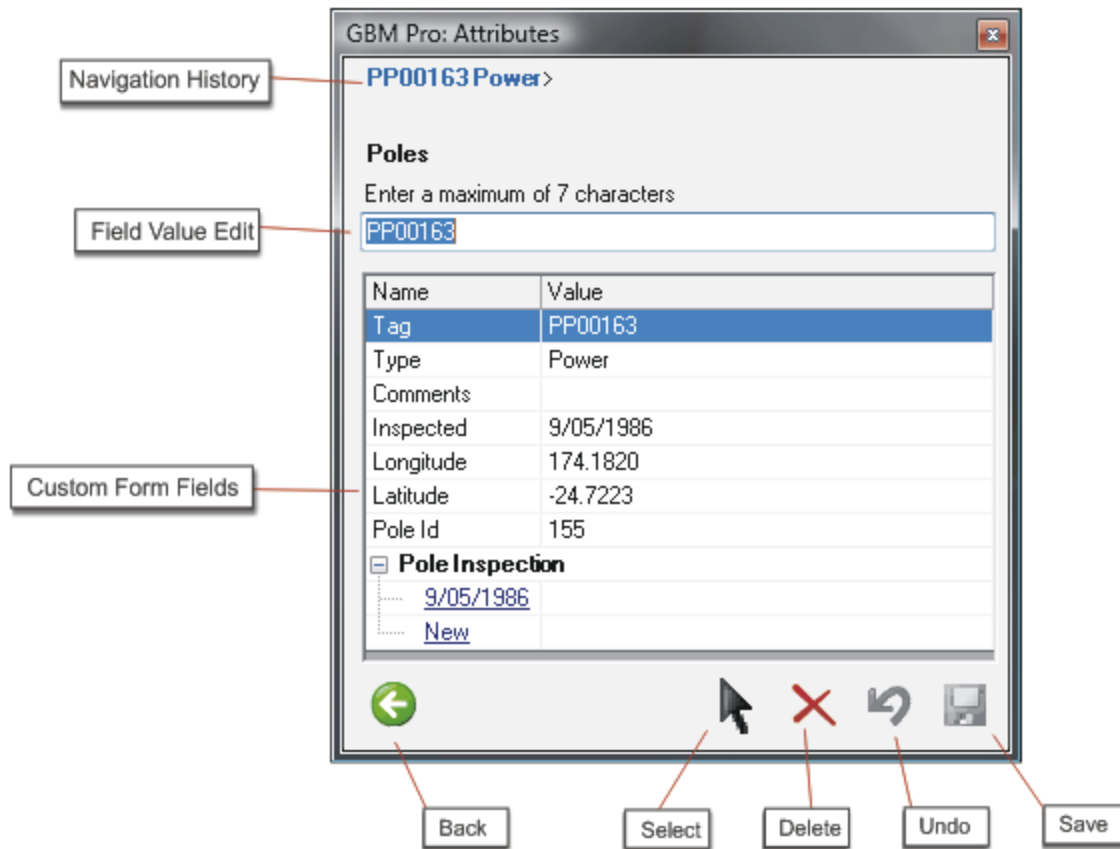


Figure 14 - GBM Pro Attributes window.

The Attributes window has the following elements:

Field Name	Type	Details
Navigation History	Hyperlink	Also referred to as a Cookie Crumb, this provides a history of forms that have been opened through other links. This is especially useful when navigating through a hierarchy of parent-child related custom forms. Clicking on a link closes the current attributes window and displays the parent form.
Field Value Edit	Text, pick list or date picker	This area is used to edit the data of the selected field.
Custom Form Fields	List-box	Displays the name and value of the attribute fields. Only those fields that are tagged as visible in the custom form definitions list here. Names are those set in the custom form definition and may differ from the name of the data column in the underlying MapInfo .tab file.
Back	Button	Closes the current form and moves back up the parent-child relationship tree if viewing related Custom Forms.
Select	Button	Selects the map object whose fields are currently being edited. This can be useful if there is more than one custom form map object on top of one another.
Delete	Button	Prompts for deletion of the currently selected feature.
Undo	Button	Undoes any edited value changes on the currently selected form after the last "Save".
Save	Button	Saves the custom form values as displayed for the selected feature.

4.4. Drawing Map Features

Map features are drawn using the GBM Pro Drawing Tool. Custom forms that have been imported into the active project define which features that can be drawn and define both the GIS object type (point, polyline, region) and graphical style for each feature.

The following will demonstrate the Drawing Window and how to use the Drawing Tool.

To draw map features:

1. To use the demonstration data, ensure that the "Road corridor Project.wor" workspace file is open and the maps are visible.
2. Ensure the GBM Pro Toolbar is visible on the workspace, otherwise select "Show Toolbar" from the GBM Pro Menu.
3. Click the "Drawing Window" button on the GBM Pro toolbar (see Figure) to display the GBM Pro Drawing Window (Figure).



Figure 15 -The GBM Pro Drawing Window button on the GBM Pro Toolbar

Note: The Drawing window can also be shown by selecting "Draw" from the GBM Pro Menu.

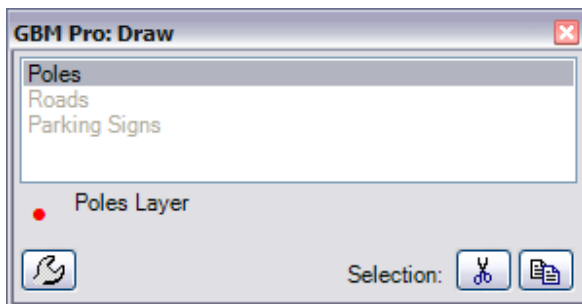


Figure 16 - GBM Pro Drawing Window.

The GBM Pro Drawing Window lists the custom forms custom forms that have been imported into the current GBM Pro Project and are configured to allow map drawing. Features that can be drawn on the current map are shown in bold.



Forms are grayed out if the target map layer is not available in the active MapInfo Mapper window. Click the Custom forms "Settings" button for further diagnostics.

The Drawing Window also contains "Cut" and "Copy" buttons in the lower right of the window for copying map features (something which is described in the next section).

4. Select the object to draw within the Drawing Window.
If using the demonstration data, click on "Poles".

Note: The GBM Pro drawing tool button will be activated once a valid feature has been selected.

5. Click on the map to start drawing the selected object.

Once the Feature has been drawn the GBM Pro Attributes window will open. Use this form to add or edit data values which are validated according to rules described in the Custom Forms.

In the above example, pole type is shown in red to indicate that this is a mandatory data field. It is not possible to save or close a form until all mandatory data has been entered.

If using the demonstration data:

- 5.1. Click on the "Type" drop-down field and choose a value from the list.

This Custom Form includes automation to insert data values that cannot be edited. In this case Pole ID has been automatically set to a unique value, inspection date has been set to the date the record was created and the map location (longitude and Latitude) have been read directly from the map. The MapInfo Info tool will show additional data values that have been set automatically but not displayed in the form. The Info tool should be used with caution as it bypasses Custom Forms validation controls.

6. Click the "Save" button to write values to the MapInfo ".tab" file targeted by the form and assign the map symbol that corresponds to the data values entered (in the power pole demonstration data different symbols are used for regular power poles and those carrying transformers).

If using the demonstration data:

- 6.1. From the "Pole Inspections" section of the attributes, click "New" to add a new inspection for this Power Pole.

Pole inspections are written through a separate form and pole inspections are automatically linked to the Poles form through the unique Pole Id value. Poles Inspections are written to the Pole Inspection Layer that needs to be open in the current MapInfo session but does not need to be added as a layer to the current map and does not need to hold spatial features.

In this example layers were opened from MapInfo ".tab" files that contain the accrual data values. In typical commercial implementations layers are opened as live linked database (ODBC) tables that directly update external databases.

4.5. Copying a Map Feature

Copying a map feature can at times be quicker than drawing it as described in section 4.4 above. Complex geometries can be built using the advanced MapInfo Professional® drawing or construction functions (distance/bearing offset, buffering and object combining) on temporary layers and then pasted into the Custom Forms layer.



Use copy to insert a new copy of the feature into the layer targeted by the Custom Form.






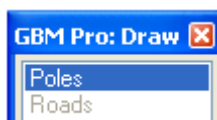
Use Cut and paste to remove the feature from the original layer and insert it into the Custom Forms layer.


To copy a map feature:

- Open a map window.
- Select a map feature through one of the standard MapInfo selection methods such as the selection picker
- Click on the Map Window that contains the layer target by the Custom Forms
- Select the target feature type from the drawing window
- Click either the Cut or Copy buttons

To paste using the demonstration data

- Open the "Road corridor Project.WOR" workspace file to display the maps
-  Through the MapInfo Layer Control set the cosmetic layer to be the editable layer
-  Use the standard MapInfo Drawing tool to draw a point feature on the cosmetic layer. Draw the feature with any graphical style.
-  Select the new temporary map feature with the MapInfo Select tool
- Click on the map that displays power poles



- Choose the Poles item from the GBM Drawing tool bar
-  Click Paste

The map feature will be removed from the cosmetic layer and pasted into the poles layer. The map graphics will be reset and the custom forms will open for data entry.

4.6. Building a Map Legend

GBM Pro provides an automatic legend feature which makes the task of building map legends very quick and easy.

To build a map legend:

7. Ensure that a Map Window is open.
(open the "Road corridor Project.WOR" workspace file as described in section 4.2.1)
8. Ensure that the "Road Corridor" is the active project (see section 4.2.1)
9. Select "Create Legend..." from the GBM Pro menu.

The Save Legend TAB File window will open.

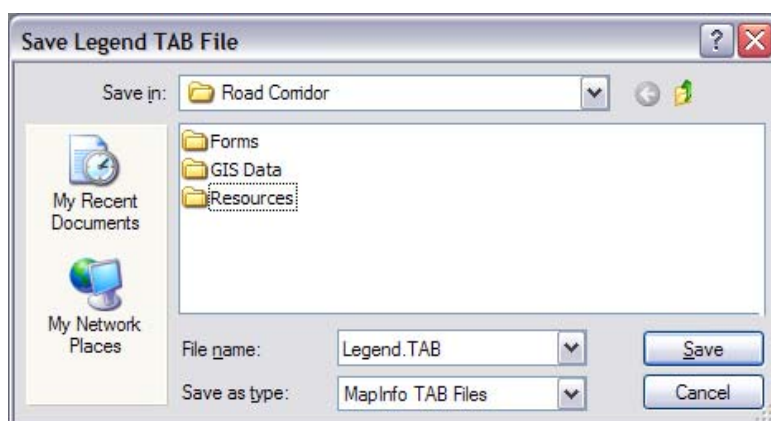


Figure 17 - Save Legend TAB File window.

10. Choose a name for the MapInfo table that the legend will be drawn into and click "Save".

A prompt will be shown asking whether to ignore the forms not used in the current map (MapInfo Mapper Window).

- 10.1. Click "Yes". If the Poles map is the current map in the MapInfo session only Poles will be written to the legend table. If the Roads map is active, then Roads and Parking Signs will be included in the legend as these are drawn onto layers that are open in the active map.
- 10.2. Repeat the steps above to create a legend, except this time select "No" at the prompt and note that the "Roads" form features are now included in the legend.

Once a legend has been saved, the ".TAB" file can be annotated or added as a frame in a MapInfo layout window using standard MapInfo tools.

5 Managing Custom Forms

This chapter provides a general introduction to GBM Custom Form design and importing forms into the current project so that they can be accessed through GBM Pro. The section is intended for data administrators who set up GBM Projects for end user operation.

More detailed information on form design is presented in Chapter 6.

This section describes:

- How to manage Custom Forms for use across GBM Software Products
- How to create a basic Custom Form
- How to import a form into a GBM Pro Project

Topics in this Section

5.1. Shared Forms Files	30
5.2. Creating a Custom Form	32
5.3. Importing Forms into a Project	35
5.4. Auto Number Ranges	37

5.1. Shared Forms Files

All GBM Software products (GBM Pro, GBM Mobile, GBM Portable and GBM Office) can use the same GBM Custom Forms. Forms are maintained centrally through the Forms Editor and either downloaded onto a PDA for operation with GBM Mobile or imported into Projects to be accessed by the other products (Figure x).

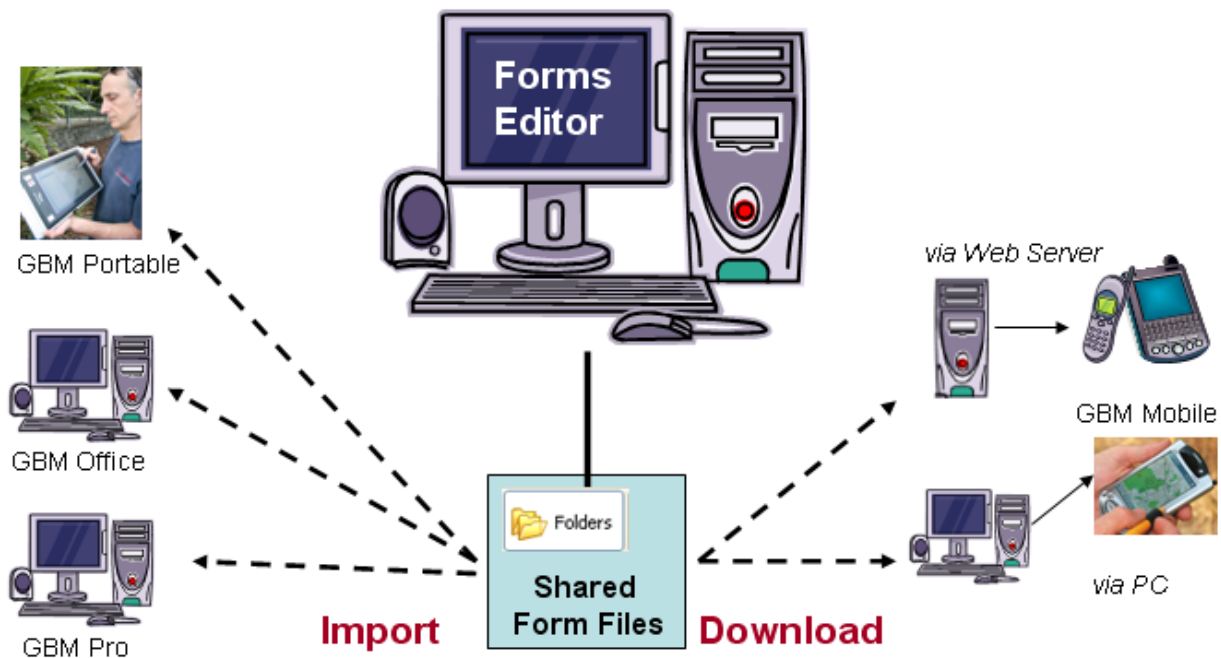


Figure 18 – Distributing forms from the shared forms files.

Each GBM Software product is distributed with a forms management utility that has been tailored for the environment that product operates in. All products share the same Forms Editor.

11. Instructions for building custom forms using the Forms Editor are provided in Section 6.

12. Instructions for importing selected forms into a GBM Pro project from the shared forms file are provided in section 5.3 below.

The GBM Pro Forms Manager screen is presented below (figure 19).

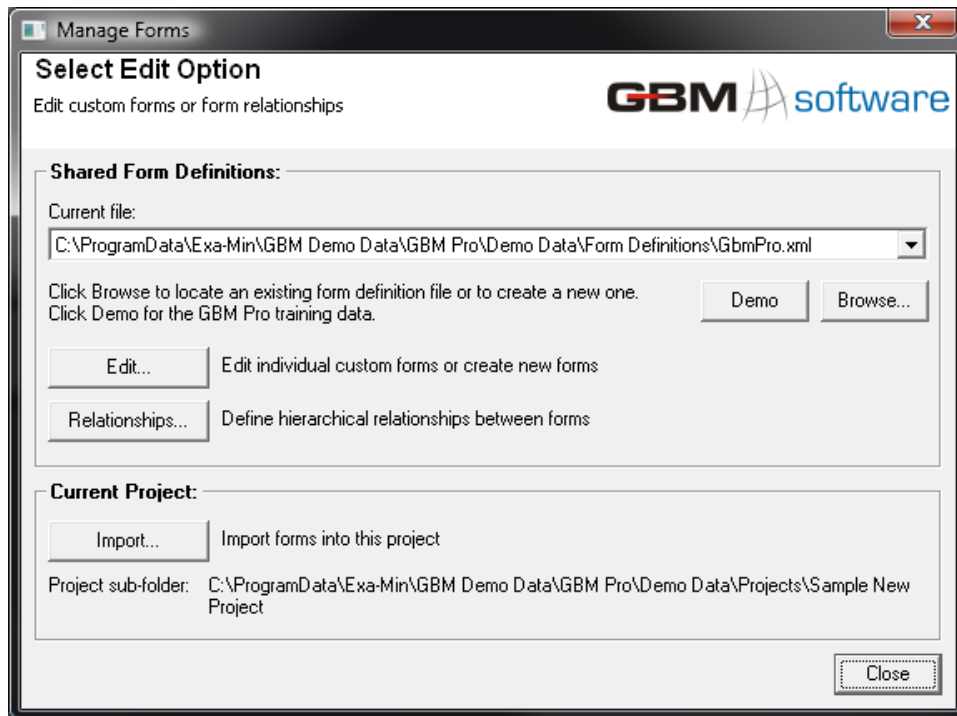
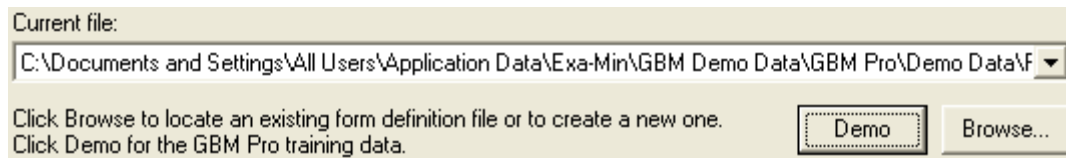


Figure 19 - Forms Manager from within GBM Pro or GBM Portable.

There are four main controls.

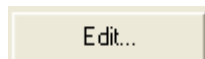
5.1.1. Shared Form File Location



The forms editor works with a central file that may contain many form definitions and these may be subsequently imported into separate projects. This control is used to specify the shared forms file that holds the forms to be modified in the current session.

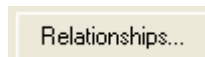
Click Demo to use the forms file that was distributed with the GBM Pro demonstration project or browse to select the required file. Select a shared forms file before clicking the "Edit..." or "Relationships..." buttons below

5.1.2. Edit Custom Forms



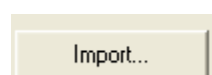
Click this button to open the Forms Editor. Instructions for building a basic custom form are provided below. More detailed instructions are provided in section 6.

5.1.3. Edit Form Relationships



Click this button to link Custom Forms in one-to-many relationships. The individual forms need to be defined (through the forms editor) before they can be linked. See section 6 for more information about linking forms.

5.1.4. Import Forms



Click this button to import forms from the shared forms file into the current project. The Forms to import window is described in more detail below.

Shared forms files that are accessed by the Forms Editor and the Relationship editor may contain many forms. The import utility creates a separate file for each Custom Form and form relationship into the forms sub-folder of the active GBM Pro home folder.

Note: Form and relationship edits are not reflected in the current project until the updated forms have been re-imported into the project. Select the target project before starting the import process as forms are imported from the shared forms file into the project folder associated with the active GBM Pro project.

5.1.5. Accessing the Forms Manager

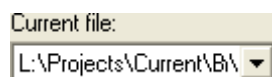
To access the Forms Manager:

13. Select "Settings" from the GBM Pro menu to display the Custom Form Settings window. Choose the GBM Pro Project.



14. Click  to open the Forms Manager

15. Set the path for the form definition file that contains the master copy of the shared forms



16. Once the desired forms definition file has been selected, it is then possible to perform the following:
 - o To modify, add or delete forms, click the "Edit" button which displays the "Edit Forms Definition" window (see section 5.2).
 17. To establish links or relationships between forms, click the "Relationship" button which displays the "Edit Form Relationships" window (see section 6.8).
- To import forms into the current project, click on the "Import" button which shows the "Forms Input" window (see section 5.3). Edits are not effective in GBM Pro until changes have been imported into the current project.

5.2. Creating a Custom Form

This section provides only a very brief introduction to Custom Forms. Refer to section 6 for a more detailed explanation of Custom Form features.

Custom forms are built on the data structure of a MapInfo ".tab" file. They will operate in GBM Software products if a .tab file with the required data structure (list of data fields and data types) is open in the current session and included on a map with the layer name defined in the Custom Form.

Custom forms are created and edited using the Forms Definition window (Figure 19)



Figure 19a - Edit Form Definitions window

To create a new Custom Form or edit an existing form:

1. Click on the "Edit" button from within the Forms Manager (Figure 19) to open the Edit Form Definitions window (figure 19a)
 - 1.1. Click the "New" button from the Edit Form Definitions window to create a new form.
 - 1.2. Click on an existing form and click the "Edit..." button to change form details
2. The Form Definition window is displayed (see Figure).

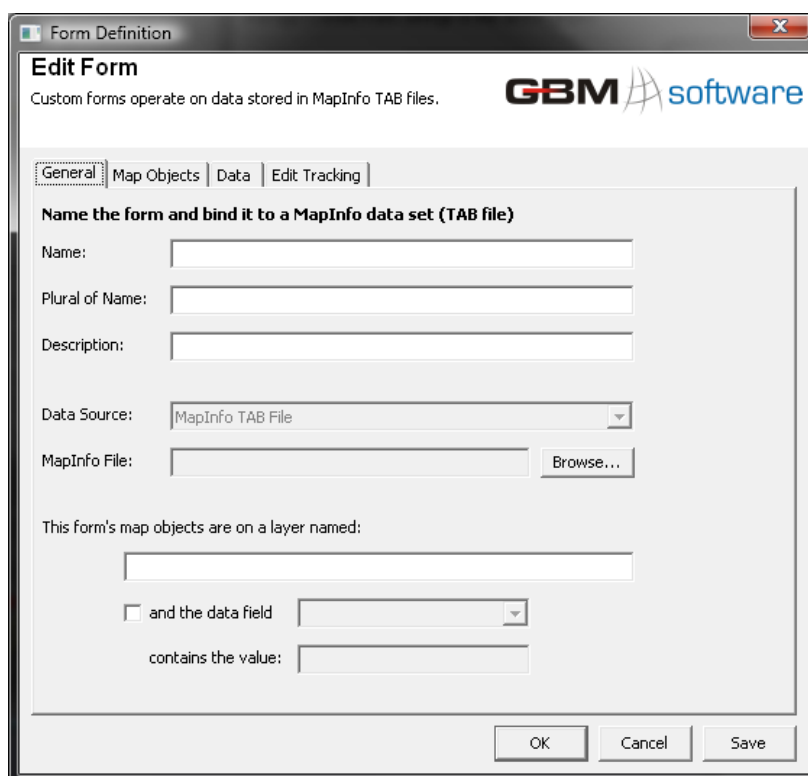


Figure 20 - Form Definition window showing the General tab.

The Form Definition window presents four tabs ("General", "Map Objects", "Data", and "Edit Tracking"). This example focuses on creating a simple form. For more complex configuration on form behavior please refer to chapter 6.

Note: As a minimum requirement, a Custom Form must contain:

- a name for the form,
- details of the ".tab" file containing the field definitions,
- and the name of the layer that the .tab file will list as in the layer control tool on the map.

3. Under the "General Tab", enter a "Name" and "Description" for the new form.
4. Click the "Browse" button next to the "MapInfo File" field and then select the ".tab" file to associate with the Custom Form.
5. Enter the name of the map layer that that the .tab file this form targets will be opened as into the "This form's map objects are on a layer named" field. This is the name that the layer will appear under in the MapInfo layer control windows.

Detail: This layer name field is populated automatically using the name of the chosen ".tab" file and will be correct unless multiple .tab files of the same name are opened in the same map or layer name aliasing has been invoked through a MapBasic script or through the workspace file.

6. Fill out details on the Map Objects, Data and Edit Tracking tab as required. Refer to section 6 for information on the settings supported through each of these tabs.
7. Click "OK".
The Forms Definition window will close and the newly created form should be visible in the list of the Edit Form Definitions window.
8. If sub-forms are to be linked to this form in one-to-many relationships, define each of the individual forms and the hierarchical links between the forms. Refer to section 6 for further information
9. Close the definitions window and the Forms Manager.
10. A prompt is shown asking whether to import form changes into the current project.
Forms must be added to a project by importing them (covered in detail under section 5.3).

For this example, click "Yes" at the prompt.
The Forms Import window is displayed.

11. Under the list of "Forms in the shared Custom Forms File", highlight the form created in the previous steps.
12. Click on "Import this form".
The form should now show a green tick ("✓") next to its name.
13. Click on "Import".
A confirmation dialog is displayed indicating the number of forms that have been imported to the active project.
14. Close the Forms Import and the Custom Form Settings windows.

Once the form has been created and imported into the current project, it can be used with the GBM Drawing tool in GBM Pro.

Tip: The status of all forms in a project can be seen on the Custom Form Settings window.

5.3. Importing Forms into a Project

This section provides details on how to add and remove forms from a GBM Software project and how to refresh forms in the project after they have been edited through the Forms Manager.

The management of forms in a project is performed through the Forms to Import window (below).

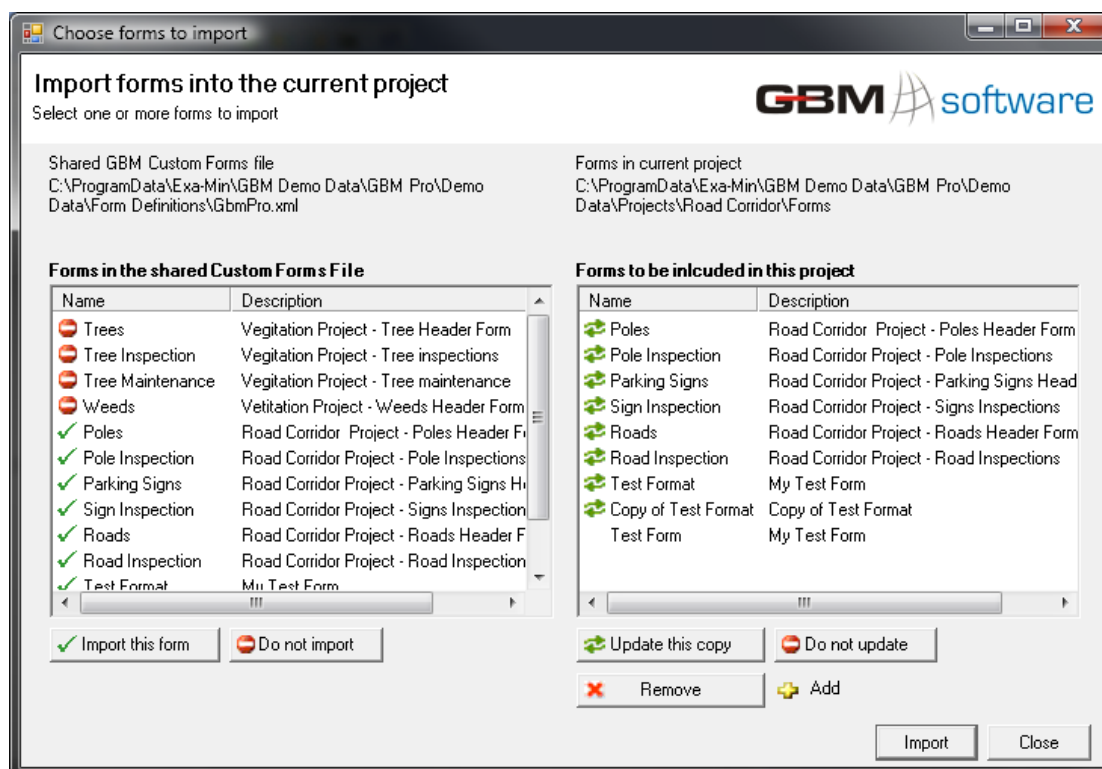


Figure 21 - Forms to Import window.

To open the Forms to Import window:

1. Select "Settings" from the GBM Pro menu to display the Custom Form Settings window.
2. From the Custom Forms Settings window, highlight the project folder on which to work, then click on "Manage Forms".

The Forms Manager is displayed.

3. Click the "Import" button.
The Forms to Import window is displayed.

The window shows the forms available in the current forms definition file on the left and the forms part of the current project on the right.

From here forms can be included, removed or updated following any changes in form design.

To include forms in a project:

1. Ensure the Forms to Import window is open for the current project.
2. Highlight the forms to be included from the "Forms in the shared Custom Forms File" list on the left.
3. Click on "Import this form" button.
Note how the icon next to each selected form changes to a green tick.
4. Click "Import" to import the forms.
A confirmation prompt will be displayed indicating the number of forms that have been imported to the project.
5. Click "Close" to return to the Forms Manager.

To remove forms from a project:

1. Ensure the Forms to Import window is open for the current project.
2. Highlight the forms to be removed from the "Forms to be included in this project" list on the right.
3. Click on "Remove" button.
Note how the icon next to each selected form changes to a red cross.
4. Click "Import" to start removing the forms.
A confirmation prompt will be displayed indicating the number of forms that have been removed from the project.
5. Click "Close" to return to the Forms Manager.

To update forms from a project:

1. Ensure the Forms to Import window is open for the current project.
2. Highlight the forms to be updated from the "Forms to be included in this project" list on the right.
3. Click on "Update this copy" button.
Note how the icon next to each selected form changes to a pair of green arrows.
4. Click "Import" to start updating the forms.
A confirmation prompt will be displayed indicating the number of forms that have been updated from the project.
5. Click "Close" to return to the Forms Manager.

5.3.1. User Interface Details

The Choose Forms to Import window is used to manage or update forms that are included in the active project. This window is accessed by clicking the "Import" button from the "Manage Forms" screen.

Note: The Choose Forms to Import window is not available in GBM Mobile, which relies on Data Profiles to identify the forms that should be included within each GBM Mobile project.

The Choose Forms to Import window has the following elements:

Field Name	Type	Details
Forms in the shared Custom Forms File	List-box	Displays the list of forms in the shared custom forms file.
Forms to be included in this project	List-box	Displays the list of forms that are included in the active project.
Import this form	Button	Flags the entries selected in the "Forms in the shared Custom Forms File" list to be included in the active project.
Do not import	Button	Flags the entries selected in the "Forms in the shared Custom Forms File" list not to be included in the active project.
Update this copy	Button	Flags the entries selected in the "Forms to be included in this project" list to be updated with any changes since the last edit.
Do not update	Button	Flags the entries selected in the "Forms to be included in this project" list not to be updated with any changes since the last edit.
Remove	Button	Flags the entries selected in the "Forms to be included in this project" list to be removed from the active project.
Import	Button	Starts the import/update process for the active project.
Close	Button	Closes the window.

5.4. Auto Number Ranges

Custom Form data fields can be set as Auto-incrementing number. In this case GBM Pro will maintain a registry of the last used number and will increment that to obtain a new value to insert each time a new data record is created through that form.

Refer to section 6 for more information on setting up Custom Forms to use automatic fields. This function is only used with projects that contain GBM Custom Forms that use the Auto numbering.

The configuration screen in GBM Pro allows setting of the next available and maximum number to be used for each layer/data field combination that uses unique numbers. An administrator can allocate ranges of numbers to ensure that the same number is not used in the same context by different users.

For example if using auto numbers to assign a unique record ID for each new map object, it is possible to set different number ranges for each operator so that record ID values are unique across a consolidated data set.

To configure the Auto Number Ranges:

1. When working within GBM Pro:
 - 1.1. Select "Auto Increment" from the GBM Pro menu.

When working within GBM Portable:

- 1.2. Select "Tools > Manage Custom Form Auto Numbers" from the GBM Portable menu.

The Set Auto Number Ranges window will be displayed. It shows the list of fields which are currently using Auto Numbering.

2. Select the data field to configure
3. Edit the "Next number to use" and "Maximum Number" fields to configure the number range as required.
4. Click onto another text box to force the window to update.
5. Close the window to store any changes.

Tip: An alternative to auto-numbering is the Custom Forms unique value option. This uses a number generator, and provided that values are inserted into a .tab file field that is large enough, it is extremely unlikely that two records will be assigned the same unique key. We recommend using the Unique Value method for linking data tables.

5.4.1. User Interface Details

The Set Auto Number Ranges window is accessed by selecting "Auto Increment" from the GBM Pro menu. This window is used to configure the parameters of fields using "Incremental Number" as an automatic value.

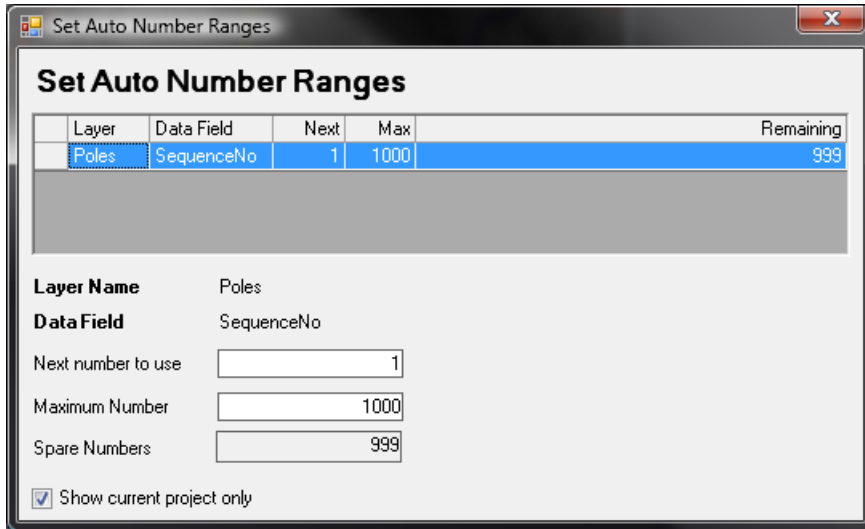


Figure 22 - Set Auto Number Ranges window.

The Set Auto Number Ranges window has the following elements:

Field Name	Type	Details
Field List	List-box	Displays the forms and fields which are configured to use the auto numbering. Select an entry to configure the other options in this window.
Layer Name	Read-only	Displays the name of the layer in which the form using this data field will be opened as in the map window.
Data Field	Read-only	Displays the name of the form field which is using the auto increment number.
Next number to use	Text	Specifies the next incremental number to use for the selected entry.
Maximum Number	Text	Specifies the maximum numbers available for the selected entry.
Spare numbers	Read-only	Displays the numbers remaining.
Show current project only.	Checkbox	When enabled, displays the forms within the active project only. When disabled, shows all forms using auto increment numbering in all projects.

6 Custom Form Design

This section explores the highly configurable aspects of form design which can control how the form behaves and functions. The section is intended for data administrators who configure custom forms for operation by general users.

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6.1. Forms Design Overview

GBM Custom form definitions describe how MapInfo .tab data will be presented to users and how users interact with that data.

To design Custom Forms which behave in a certain manner, the form designer needs to become familiar with the Forms Definition window of the GBM Custom Forms Editor (figure 24).

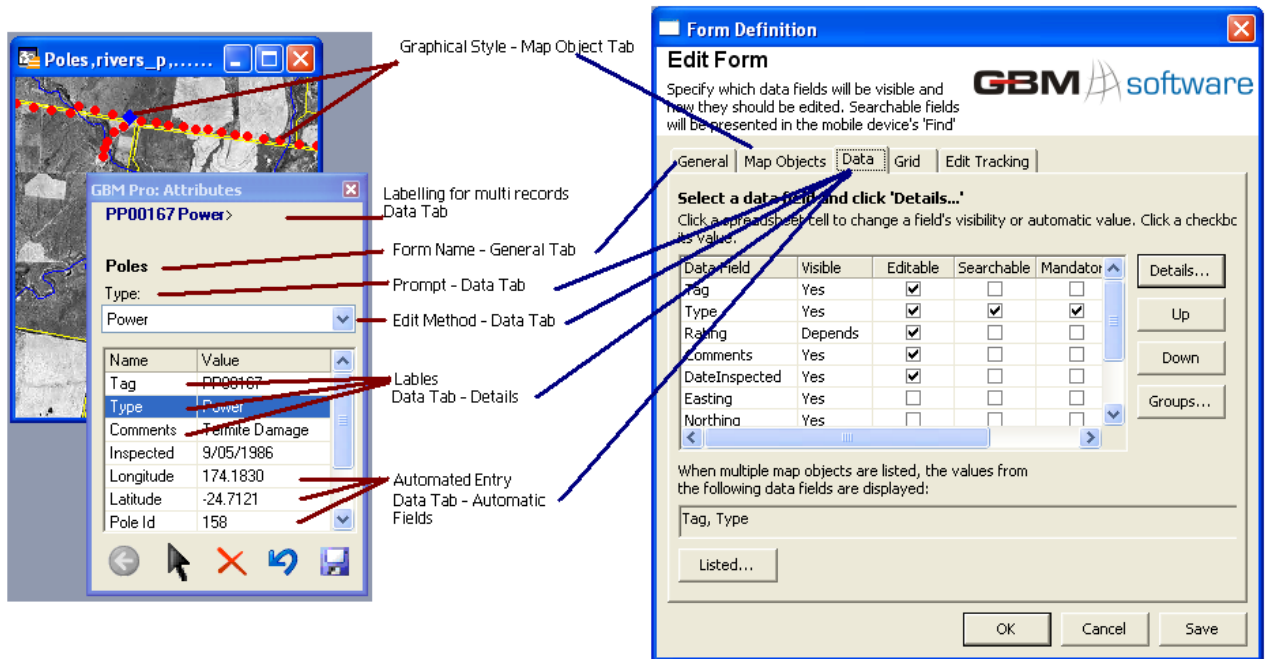


Figure 23 – Forms Editor

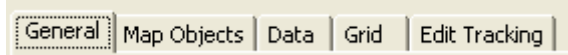
The following instructions open the Form Definition window.

To edit a Custom Form definition:

For GBM Pro:

1. Select "Settings" from the GBM Pro menu to display the Custom Form Settings window.
2. From the Custom Forms Settings window, highlight the project folder on which to work, then click on "Manage Forms".
3. Select the correct shared forms file.
4. Click on the "Edit" button from within the Forms Manager.

The Forms Definition window presents five tabs:



- **General tab**

The General tab is used to select the MapInfo .tab file that describes the structure of the MapInfo table the selected form is linked to and the layer name that the form will be opened under. It also allows for conditional display of the form based on the values entered into specified .tab file data fields.

See section 6.2 Conditional Form Display for further details.

- **Map Objects Tab**

The Map Objects tab determines the graphical appearance of the map feature associated with the Custom Form on a map layer (e.g. color, line style etc). It also provides control over whether the objects can be drawn or deleted, whether to show the Custom form if it is selected, or even configure different display styles based on conditional data values in the form fields.

See section 6.6 Graphical Style Configuration for further details.

- **Data Tab**

The Data tab is used to select which MapInfo data fields (columns) are presented on the form, which columns can have their values changed by field operators and how those values should be edited (e.g. drop down list selection or type-in with range checking).

See section 6.7 Data Field Configuration for further details.

- **Grid Tab**

The Grid Tab is used to describe tabular (spreadsheet view) data presentations. It is not supported in GBM Pro but is important for the more sophisticated GBM Software solutions that connect directly to relational databases. The grid tab is not normally displayed to GBM Pro users.

- **Edit Tracking Tab**

This tab is used to set instructions for consolidating data that may be recorded on multiple computers running GBM Mobile and GBM Portable. Edit Tracking allows data edits and new observations recorded on separate computers to be merged into a single master data set.

GBM Pro does not support Edit Tracking. Edit tracking requires the GBM Mobile Merge utility that is supplied with GBM Portable and GBM Mobile but is not licensed to be used with the standard edition of GBM Pro.

GBM Pro Customers who wish to use GBM Mobile style Edit Tracking should contact their GBM Software reseller to license an enhanced edition.

6.2. Conditional Form Display

For a single layer, different forms can be presented depending on one of the data values. For example, a park maintenance officer may use different forms for describing inspections for each type of playground equipment (swing, slippery slide, see-saw), even though all items are stored in the one MapInfo Professional® table.

The forms definition can be used to define when a form will display on a given layer.

To enable conditional form display:

1. Edit the required form by opening the Forms Definition Window and then select the "General" tab.
2. Enable the "and the data field" checkbox, then select the field and enter which value to check for (see Figure 24).

Figure 24 - Enabling data conditional form display.

3. Click "Save" or "OK" to accept your changes.

6.3. Presenting forms

- Automatically present the form after creating the map object.

If this item is checked, the Custom Form will appear automatically each time a new map object is drawn. This check box is on the map objects tab.

6.4. Creating new data records

- Allow the creation of new map objects.

Tick this check box if the end user is permitted to use this form to create new records. It is possible to draw new features on a non-editable layer if the check box is ticked. This check box is on the map object tab.

6.5. Controlling deletion of data record

- Allow the deletion of objects using the form's Delete button

If this box is not checked, operators will not be able to delete records using the delete button on a Custom Form. This check box is on the map objects tab.

6.6. Graphical Style Configuration

Graphical styles can be used to control how the feature associated with a Custom Form appears on a mapping layer. The style definition can also include conditional formatting, allowing for different representations of a map feature depending on data values.

To set the default graphical style:

1. Edit the required form by opening the Forms Definition Window and then select the "Map Objects" tab (see Figure 25).

Figure 25 - Style Editing section of the Map Objects tab.

2. Ensure that the "Allow the creation of new map objects" checkbox is enabled if wanting to allow users to use this object in their maps.

Note: It is also possible to control if users can delete the object from a map by enabling the "Allow the deletion of objects using the form's Delete button" checkbox.

3. Click the "Style" button.
The Symbol Style window appears.
4. Set the default display style as required, then click "OK".
5. Click "Save" to store the changes for the selected form.

To set graphical styles based on data values:

1. Edit the required form by opening the Forms Definition Window and then select the "Map Objects" tab (see Figure 2).
2. Enable the "Use different styles depending upon the value in a data field" checkbox.

Use different styles depending upon the value in a data field:

3. Click on the "Styles for Values" button.

Styles for Values...

The Styles for Values window appears (see Figure 26).

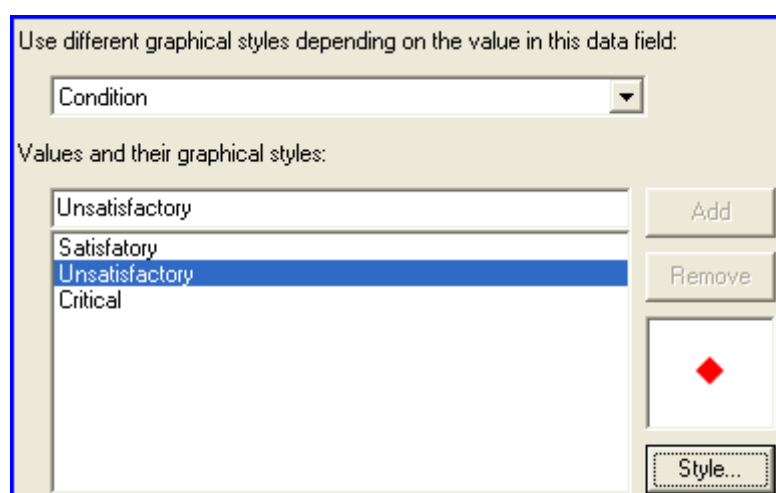


Figure 26 - Styles for Values window.

4. Select the data field whose values will control the graphical style from the drop-down at the top of the window.
5. There are two fields under the "Value and their graphical styles" section of the window. The top field is used to add values to the list of conditional entries, which appear in the lower section of the window.
6. Enter a value for the selected field and then click "Add" to include it in the list of conditional values.

Note that the value is highlighted in the list and the current graphical style for that condition is displayed in the box to the right of the window.

7. Click on the "Style" button to open the Symbol Style window.
8. Edit the style as required and then click on "OK".
9. Add as many conditional styles as necessary.

Tip: Setting a condition on a field value should be combined with data validation (e.g. by using a drop-down box of possible values for the field) to ensure the right field values are entered by users. See section 6.7 for more details on how to do this.

10. To remove a conditional entry option, highlight it from the list and click the "Remove" button.

11. Click "OK" to store the changes.

6.7. Data Field Configuration

The configuration of data fields within a form is one of the more powerful aspects of GBM Pro and if used correctly can lead to great improvements in data quality and consistency. This section provides details on how to set and enforce the behavior which determines how table data can be edited through the forms.

The following attributes can be set for each data field in the MapInfo .tab file:

- **Field name aliasing** - Set the display label for a field to be different from the field name
- **Prompting** - Display a custom prompt during data entry
- **Edit style** - Set the field to be a drop-down list of values or an open text field
- **Data Defaults** - Set a default value for the field
- **Visibility** – Define circumstances when the data field will be visible or hidden
- **Edit-ability** – Allow or disallow data editing on a field by field basis
- **Search-ability** – Select which fields are offered in the search screens (GBM Mobile only)
- **Mandatory Field** - Set a field as mandatory for data input
- **Automatic Data** - Configure automatic value creation for an individual data field
- **Grouping** - Group data fields to organize form entries and simplify display (GBM Mobile only)

6.7.1. Data Labels and Prompts

The way in which data fields are defined is often not clear in terms of their usage or intended purpose. The Custom Forms allow data fields to be aliased so that they are labeled with text that is more easily understood by users of the data.

To set the display label for a field:

12. Edit the required form by opening the Forms Definition Window and then select the "Data" tab (see Figure 27).

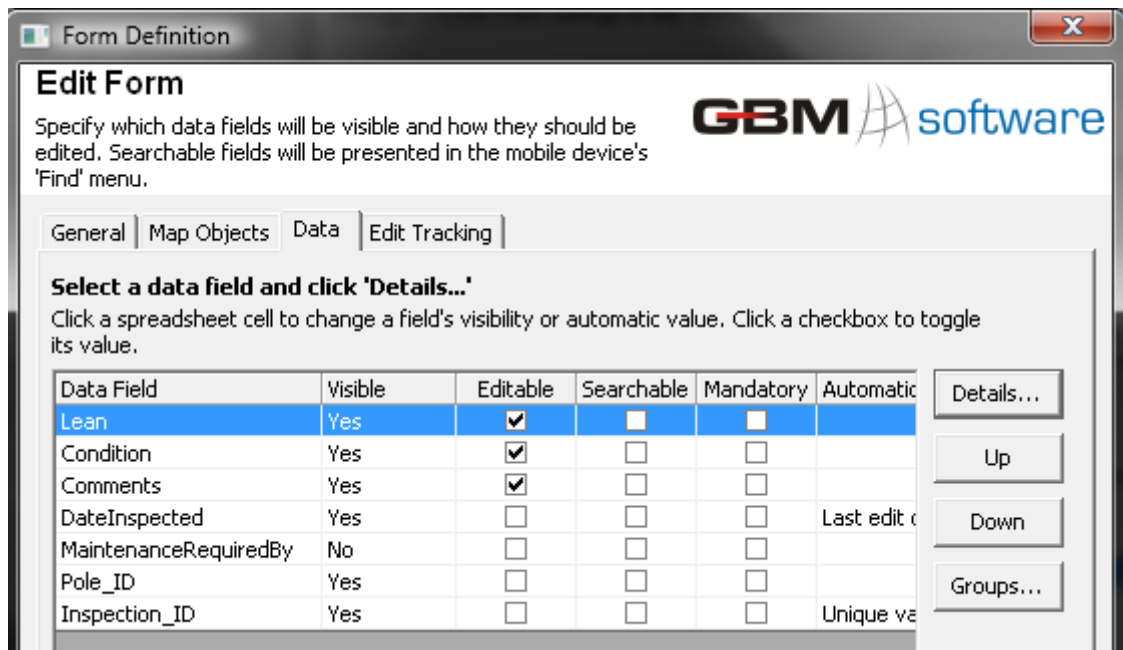


Figure 27 - Forms Definition window showing Data tab.

13. Highlight the required field, then double-click on it or click on the "Details" button. The Data Field Definition window is displayed.

14. Enter the required label into the "Use the following label" field.
15. Click on "OK" to store the change and return to the Forms Definition window.

To set a custom prompt for the field:

16. Edit the required form by opening the Forms Definition Window and then select the "Data" tab.
17. Highlight the required field, then click on the "Details" button.
The Data Field Definition window is displayed.
18. Enter the required prompt into the "Display the following prompt" field.
19. Click on "OK" to store the change and return to the Forms Definition window.

6.7.2. Pick Lists

When consistent input terminology is required during data input, nothing is easier for a user to understand than having a pick list of data values.

For text and integer data, there is an option for selecting a value from a drop-down list.



Click the *List...* button to edit the list of options to be presented to the Pro user.

Value	Description (Optional)
3	Strong
1	Weak
2	Medium

Figure 28 – Custom Form Pick Lists

Enter new values in the top boxes and click *Add* to include them in the list. Select a value in the bottom box and click *Remove* to delete that entry.



The import and export functions allow values to be read from external text files or saved to a text file for re-use in another form.



Click the up and down arrow keys to set the order in which values will be listed in the drop-down combo box on the mobile device.

6.7.2.1. Cascading pick lists

It is possible to present the selection lists depending on values entered in another data field.

For example, an operator doing a tree survey may first select a genus, and then be restricted to selecting species values for entry into a second field from those that are within the previously selected genus.

6.7.2.2. Code tables

For pick list selection, it is also possible to allow the user to select from a list of extended descriptions, but have the system enter the corresponding codes into the data files.

Possible values:	
R5-35	No standing
Value	Description (Optional)
R5-4	Four hour parking
R5-10	Unlimited parking
R5-10-D	Unlimited parking - disabled
R5-35	No standing

Figure 29 – Code Tables

In the above example, the text *No standing* will be offered for selection in the drop-down list, while the code *R5-35* will be written to the data file if that option is selected on the mobile device.

If the *Description* column is left blank, the data in the *value* column will show in the pick list presented to the user.

6.7.2.3. Pictorial Pick Lists

Images (.jpg, .bmp or .gif files) or sound segments (.wav files) may also be presented to operators to assist them to choose options from selection lists. This option is activated automatically if images files are loaded into the appropriate reference folder on the end-user computer.

Edit this data field by:

Choosing from a list of possible values

Image and sound file selection options are only available for text data fields where the edit mode is set to “*Choosing from a list of possible values*”. The names of the names of the image and sound files must match the text in the *Value* column of the custom form definition.

Value	Description (Optional)
R5-4	Four hour parking

Custom form set up

The screenshot shows the GBM Mobile application interface. At the top, it says 'GBM Mobile' with a status bar showing '5:41' and an 'ok' button. Below that, the instruction 'Choose a sign from image library' is displayed. A central image shows a green '4P' parking sign. At the bottom, a dropdown menu is open, showing 'Four hour parking' as the selected option. Navigation arrows are visible on the right side of the dropdown.

In the example above, GBM Mobile will search the reference folder for image files named R5-4.jpg, R5-4.bmp and R5-4.gif and if found, will present one image for each list option. GBM Mobile will also look for a sound file named R5-4.wav, and if found, will provide an option for the user to play that file.

Reference images may be installed automatically by including them in the Operators Profile (section 3.2.4 below) or manually as described below.

Reference images and sound files are normally loaded into the folder **Program files\GbmMobile\forms\<form name>\<field name>**, where *<form name>* is the name of the custom form and *<field name>* is the name of a data field referenced by that form.

Alternatively, this folder may contain a file called config.xml that identifies the folder containing reference images. The folder name is described in the XML tag "root" in that file (see example below).

```
<xml>
  <root>\SD card\my images</root>
</xml>
```

In the above example, the image path has been re-directed to the sub-folder *my images* on the SD card (the folder name is entered between the start tag <root> and end tag </root>). The GBM Mobile Manager Load Data Wizard will create this file automatically if necessary.

Image selection will be offered automatically where pick lists have been defined as code tables (see above) and images that have names corresponding to each of the codes have been loaded into the correct folder on the end-use computer.

For GBM Mobile operation, images will be installed automatically if they are described in the Load Profile. Refer to the GBM Mobile user manual for further information.

For GBM Pro, GBM Portable and GBM Office, the images need to be manually installed into sub-folders of the resources folder in the Project folder. The structure corresponding to the GBM Pro demonstration data is shown below.

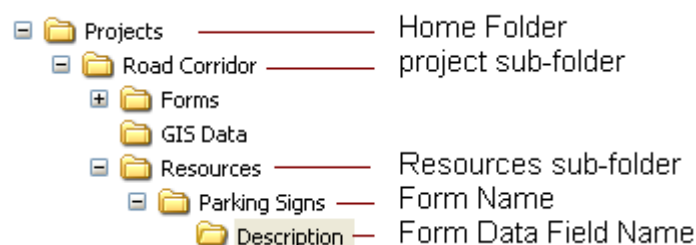


Figure 30 – Pictorial pick list folder structure

6.7.2.4. Defining Pick Lists

To set a field as a drop-down list:

1. Edit the required form by opening the "Form Definition" Window and then select the "Data" tab.
2. Highlight the required field, then double-click on it or click on the "Details" button.
The Data Field Definition window is displayed.

The field type is determined by the selection of the "Edit this data field by" drop-down. The default value is "Typing a value" which means that the field is open for any input.

3. Set the data field type as "Choose from a list of possible values".
Note that the lower section of the Data Field Definition window now displays a field showing the configured list values.
4. Click on the "List" button.
The List Definition window is displayed (see Figure).

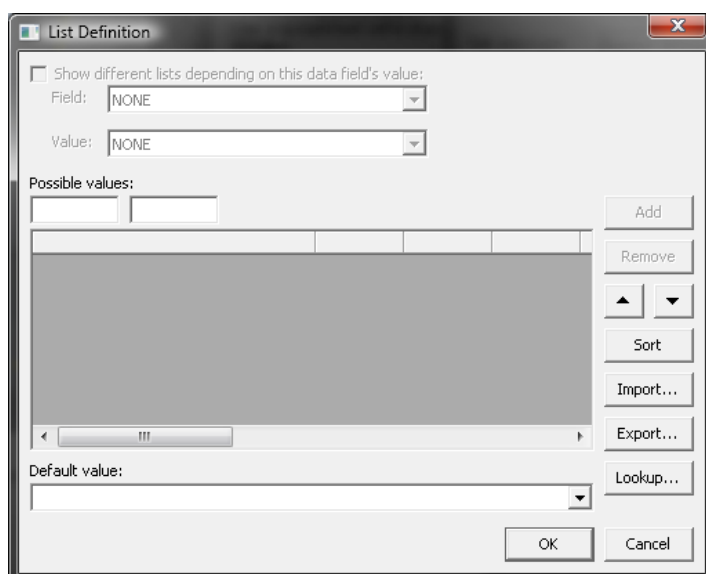


Figure 31 - List Definition window.

For GBM Pro, the list of values can be added manually or imported from a text file.

There are two fields below the "Possible Values" label. The left input is used to enter the field value (mandatory) and the adjacent field is to enter a description (optional). If the "Description" is left blank, the data in the "value" column will show in the pick list presented to the user.

5. Enter the field details as required, then click on "Add".
The values are added to the displayed list of values.
6. Continue adding values as described above and then click on "OK" to store the changes and return to the Data Field Definition window.

6.7.3. Data Defaults

In order to make data entry more efficient or to provide users with suggestions on data content, a default value can be configured for any data field.

To set a default field value:

1. Edit the required form by opening the Form Definition Window and then select the "Data" tab.
2. Highlight the required field, then click on the "Details" button.
The Data Field Definition window is displayed.

If the field is a typed value:

- 2.1. Enter the default value(s) into the provided fields at the bottom of the Data Field Definition window.

Note: The default options change depending on the data type configured in the table (.tab) file for that field. Numeric or date type fields will allow for a range of values as well as the default to be specified.

If the field is a list:

- 2.2. Click the "List" button to display the List Definition window.
- 2.3. Select the "Default value" from the drop-down at the bottom of the List Definition window.
- 2.4. Click "OK" to save the selection and return to the List Definition window.
3. Click on "OK" to store the change and return to the Forms Definition window.

6.7.4. Data Field Visibility, Edit-ability and Search-ability

It is not uncommon for a MapInfo table to contain fields which are intended for background or system purposes and are not of immediate interest to certain groups of end-users. GBM Custom Forms can be configured to:

- Display or hide a data field under certain conditions.
- Turn field edit-ability on or off.
- Turn field search-ability on or off

These controls are available on the Data tab


Data Field	Visible	Editable	Searchable
Easting	No	<input type="checkbox"/>	<input type="checkbox"/>
Northing	No	<input type="checkbox"/>	<input type="checkbox"/>
Title	Yes	<input type="checkbox"/>	<input type="checkbox"/>
DateInspected	No	<input type="checkbox"/>	<input type="checkbox"/>
Type	Yes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Rating	Depends	<input type="checkbox"/>	<input type="checkbox"/>
Condition	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 32 – Setting visibility, edit-ability and search-ability

To configure field visibility:

1. Edit the required form by opening the Form Definition Window and then select the "Data" tab.
2. Click into the "Visible" grid cell of the required form field entry.

Data Field	Visible
Rating	Depe ...

3.  A button will appear on the right hand side of the cell. Click that button to open the Data Field Visibility window (figure 33).

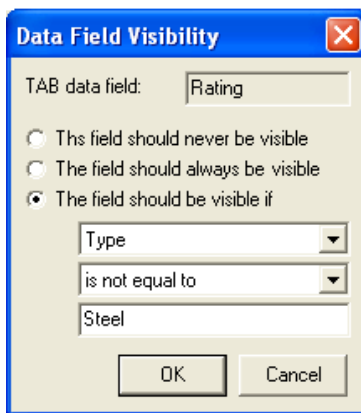


Figure 33 - Data field visibility window.

The visibility can be configured to be on, off or conditional.

4. Configure data field visibility as required and then click "OK" to save the changes and return to the Forms Definition window.

To configure field edit-ability:

Editable
<input checked="" type="checkbox"/>

End users can only modify the values of editable data fields. Both editable and non-editable data fields can be populated with pre-existing, default or automatic values (see below).

5. Edit the required form by opening the Forms Definition Window and then select the "Data" tab.
6. To make a field editable by users, enable the "Editable" checkbox for the required field.

Note: Turning off the edit rights for users can be useful when populating the field value using automatic values (see below).

- Click "OK" or "Save" to store the changes.

To configure field searchable attribute:

- Edit the required form by opening the Form Definition Window and then select the "Data" tab.
- To make a field searchable, enable the "Searchable" checkbox for the required field.
- Click "OK" or "Save" to store the changes.

6.7.5. Mandatory Data Entry

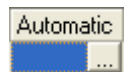


During any data collection, mandatory values are often required and this type of field behavior can be configured within a custom form to ensure forms cannot be saved without appropriate data input.

To set a field as mandatory:

- Edit the required form by opening the Form Definition Window and then select the "Data" tab.
- To make a field mandatory for data input, enable the "Mandatory" checkbox for the required field.
- Click "OK" or "Save" to store the changes.

6.7.6. Automatic Values



The GBM Custom Forms allow values to be created from values stored in other data fields. The types of values which can be generated are depended on the data type of the target field.

To set an automatic field value:

- Edit the required form by opening the Forms Definition Window and then select the "Data" tab.
- Click into the "Automatic" grid cell of the required form field entry. Note there is a button "..." in the right of the cell which needs to be clicked to display the Data Field Automatic Value window (see Figure).



Figure 34 - Data Field Automatic Value window.

- Select the automatic value type from the "Update the data field using" drop-down list. Note that the options which are available to use in this field depend on the TAB data type. Refer to the following table for available options and how they can be used.

Update Using	Description	Available if Field Type is..
X	The feature's location. If a GPS is being used, the feature will have been created at, or moved to, the GPS location. The X and Y locations are also updated if an object is dragged to a new map location.	String
Y		Float Decimal

Update Using	Description	Available if Field Type is..
	x/y coordinates will be converted to the native projection of the target MapInfo table.	
Altitude	The altitude indicated by the GPS if supported by that unit, otherwise this will be zero. This is GPS ellipsoid height and may vary significantly from sea level related height values.	String Float Decimal
Length	The feature's length, area, or perimeter calculated from GIS analysis. Set to zero if the feature is a not of the appropriate type.	String Float Decimal
Area		
Perimeter		
Creation time	Time of feature creation, from the device's system clock, expressed in Coordinated Universal Time (UTC/GMT). Times can be used with text or floating-point fields. If floating-point, they're expressed as VARIANT times. Dates can be used with date fields.	String Float Date Time
Creation date		
Last edit time	Time of the feature's last edit, from the device's system clock, expressed in Coordinated Universal Time (UTC/GMT). Times can be used with text or floating-point fields. If floating-point, they're expressed as Microsoft VARIANT times.	String Float Date Time
Last edit date		
User Specified Time	A date and time specified by the user via a date control. There is also a "Now" button that puts the current date/time in the field. Note that this is not strictly an automatic value. The user does have to enter the date/time.	String Float
GPS Time	The GPS time (in UTC) represented as a string: HHMMSS.SSS.	String
GPS Post Processing ID	The internal ID used to associate a feature in a data file with the points in the POSTPROC.TAB file that are to be used by the post-processing MBX to correct the feature's position. Unless a field has this auto-value, features created using the form cannot be post-processed. Note: This feature is only supported in GBM Mobile for Trimble edition.	String
GPS PDOP	The PDOP for the GPS position(s) received when creating or moving this feature. PDOP is a measure of GPS accuracy derived from the geometry of the satellite array used to determine the location. Note: This feature is only supported in GBM Portable and GBM Mobile. GBM Pro does not support GPS equipment	String Float Decimal
Device ID	The device ID specified by the user in the PDA's Start/ Settings/ System/ About/ Device ID dialog.	String
Unique Value	An auto generated unique value. This can be used with text and integer fields. Ensure uniqueness by using long data fields (e.g. using a 2 character integer field gives a chance of 1 in 99 that two records will be assigned the same number, but using a 15 character integer field will ensure there is only one chance in 999,999,999,999,999 of two records being assigned the same number.)	String Integer Sml-Integer
Incremental number	An incremental number from a range set for the layer when the profile was loaded onto the PDA, or in the case of GBM Portable, through the administration menu. If the numeric range assigned to the device is exhausted, zeros are used.	Integer Sml-Integer

Update Using	Description	Available if Field Type is..
	This type of auto field is further configurable by setting a range of numbers. See section 5.4 for further details.	
From the last-created object	The value from the same field of the last created object on the layer. If no object is found, the field is left empty.	String Integer / Sml-Integer Float / Decimal Date / Time Boolean
From the last created sibling	Looks for the last created sibling that has the same parent Id and copies the value of the field into the new feature. If there is no sibling, then the field remains empty. This feature applies to linked forms.	String Integer / Sml-Integer Float / Decimal Date / Time Boolean
From an object on another layer	Looks for objects on the specified layer that are within the specified buffer. If multiple objects are found, they are listed and the user selects one. This copies the value from the specified field or layer into the attribute field of the new map feature.	String Integer / Sml-Integer Float / Decimal Date / Time Boolean
From the selected object	The value from the specified field of the currently selected object. Only works with the "Create from Selection" command.	String Integer / Sml-Integer Float / Decimal Date / Time Boolean
Expression	<p>Either a numeric or text expression that can include references to other fields. This option also supports referencing other fields that are themselves evaluated as expressions.</p> <p>This can be used with text or numeric fields. Numeric expressions are made up by combining field names with normal numeric operators (e.g. + / - *). The "&" character is used to concatenate text strings. Use double quotes to enclose text. For example:</p> <ul style="list-style-type: none"> • LENGTH X WIDTH (to multiply the value in data field LENGH by the value in data field WIDTH). The result could go into a numeric or text field • "Asset Number =" & Asset_ID (to build a text string that concatenates the text "Asset Number =" with the text in data field Asset_ID. The result would need to go into a text field. 	String Integer Sml-Integer Float Decimal
Photograph	This is the photograph taken when in the feature attributes dialog and stores the photo filename in the data field. Note: This feature is only supported in GBM Mobile.	String
Target Photograph / Ike Photograph	This references the filename of the photo taken as part of the target (offset) capture. Note: This feature is only supported in GBM Mobile. Ike Photograph is supported for GBM Mobile for Ike edition only.	String
Specified time	A time specified by clicking the "Now" button in the attributes dialog. (Like "photo" this is more of an edit method than an automatic value) or entered manually. If the user clicks the "Now" button, the current time is entered based on the system time settings (normally local time rather than UTC or Greenwich Mean Time). This can be used with text or floating-point fields. If floating-point, they're expressed as VARIANT times.	String Float
Measured distance	These are the measurements that can be taken with a rangefinder	String

Update Using	Description	Available if Field Type is..
Measured area	– such as the Contour XLR ic. The distance could be a range, a horizontal or a vertical distance.	Float Decimal
Measured perimeter	At this stage only GBM Mobile supports automated measurement equipment. This feature is not available for GBM Pro users.	

17. Click "OK" to save the changes and return to the Form Definition window.

18. Click "OK" or "Save" to store the changes against the form.

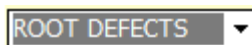
Additional automatic values may present for selection from the list but are not necessarily supported by all products that use custom forms. GBM Pro does not support photographs or GPS input.

6.7.7. Field Grouping

Data fields which have a logical relationship can be grouped together in order to make selection or data entry easier for an operator.

Note: Grouping is only supported for GBM Mobile. Group definitions are ignored when the forms are imported into GBM Pro, GBM Portable and GBM Office projects.

Grouping makes it easy for operators to jump to the top of a section in a long Custom Form. While grouping is available when Custom Forms are used in GBM Mobile, this release of GBM Pro does not support it.



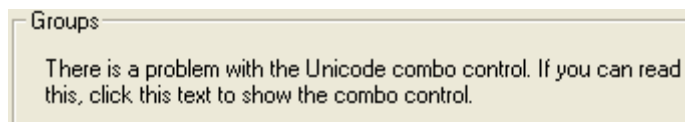
Use the drop-down list to move to the start of a specific group.



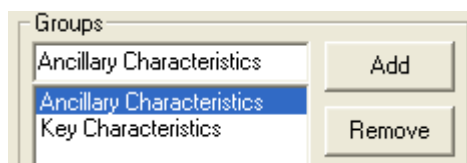
To define groups, click the *Groups...* button on the Custom Forms *Data* tab.



Click this check box to activate the group control.



Depending on the software environment on your machine, the area below the check box may show this message or may show the group definition panel. If the panel does not appear immediately, click on the above text to display the group edit panel.



Use this panel to build a list of groups. Type in a group name and click *Add* to add entries to the group. Select a group and click the up and down buttons to change the group order, or click the *Delete* button to remove a group from the list.



To assign Custom Form data fields to a group, first select a group from the list in the top panel, then select one or more Custom Form data fields in the lower panel and click the *Group* button.

To group data fields:

1. Edit the required form by opening the Forms Definition Window and then select the "Data" tab.
2. Click on the "Groups" button.
The Groups window is displayed (see Figure)

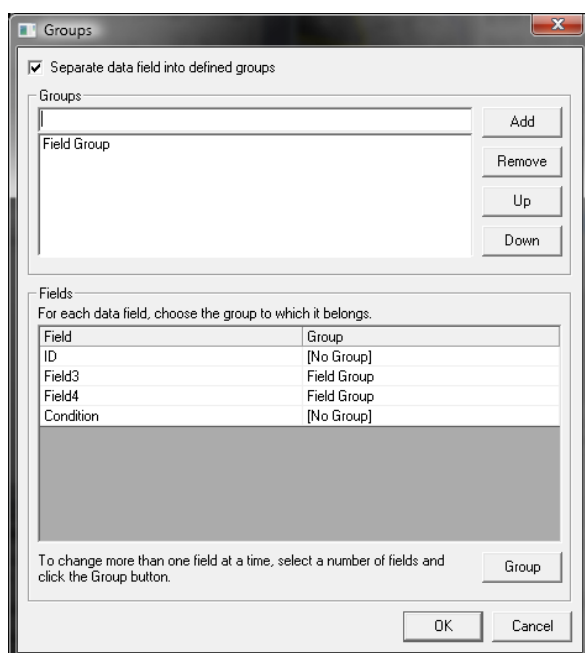


Figure 35 - Data field Groups window.

Grouping makes it easy for operators to jump to the top of a section in a long custom form.

3. Enable the "Separate data field into defined groups" checkbox.
4. Enter a name for the new group into "Groups" field and then click "Add" to create the group.
Note how the group now appears in the list of entries under "Groups".
5. Select the group from the list of shown "Groups", then select the "Fields" to include into that group and click the "Add" button.

Note that the group association is shown next to each field in the list.

To remove a grouping, select the group and click on "Remove".

6. Click "OK" to save the group changes and return to the Form Definition window.
7. Click "OK" or "Save" to store the changes against the form.

6.7.8. Data Attribute Listing

It is possible to choose which data values will be listed against each instance of a sub-form for linked sub-tables or in the main custom forms screen when multiple features are found at a click point.

To choose data values:

1. Open the form in the form editor and choose the Data Tab
2. Click the ":Listed..." button at the bottom of the screen
3. Select a data field in either of the panels and click an arrow button to add or remove it from the list of data fields that will be displayed against the data instance
4. Click any of the selected fields in the right hand panel and click the up or down buttons to change the order in which items are listed.

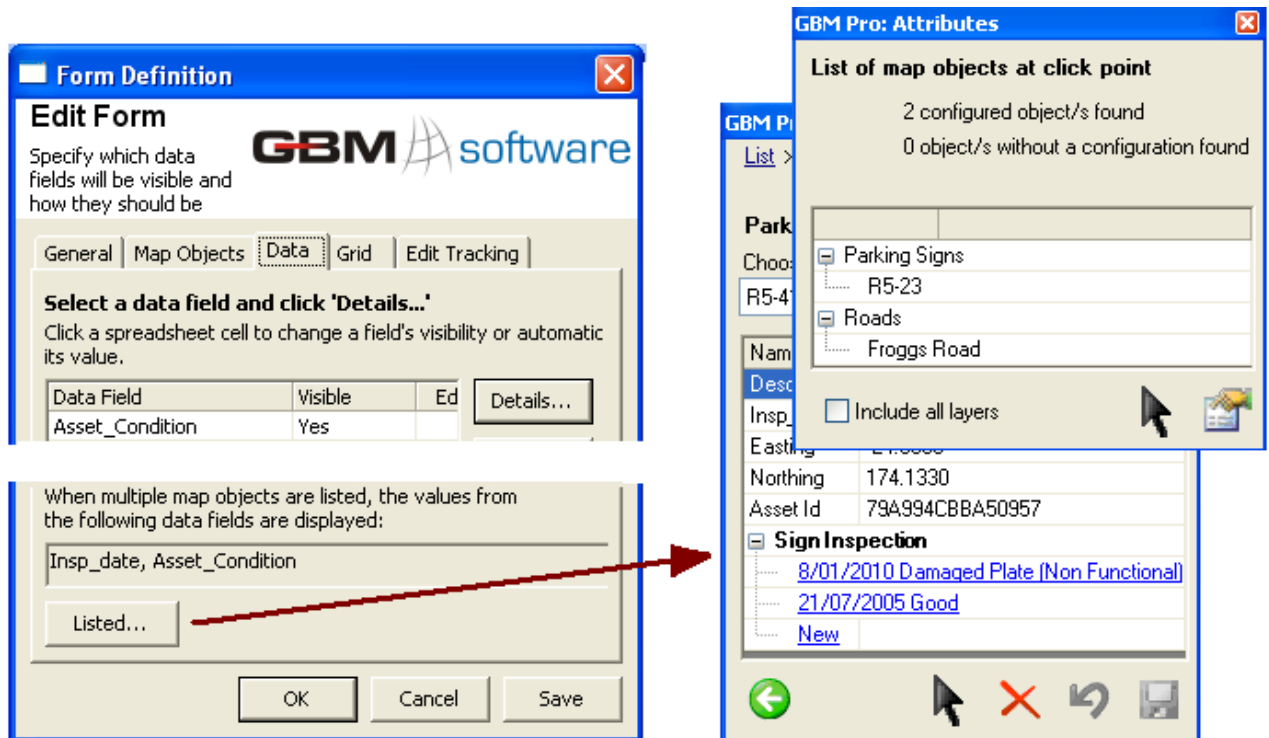


Figure 36 - Setting data fields for list displays

6.8. Form Relationships

Custom Forms can maintain one-to-many (hierarchical) data relationships between map features and multiple other data sets.

These relationships will work with standard MapInfo ".tab" files and with ".tab" files that link to database tables. Linked tables do not need to include a spatial feature and may therefore reside in standard databases that may otherwise not support spatial data.



Figure 37 - Example data relationship between a form and table.

In Figure 37 the "Poles" layer contains the spatial element within the project and acts as the parent in the relationship. Pole inspection data is kept in a layer called "Pole_Inspections". Many Pole Inspections can be attached to the parent table Poles. Note that there is a common field between "Poles" and "Pole Inspections" named "Pole ID". The "Pole ID" is used to link the Inspection to the pole in the Custom Form.

Relationships such as these are defined within the project through the Edit Relationships window of the Forms Manager.

6.8.1. Creating a new Form Relationship

Linking relies on common values between parent and child tables in a similar manner to the way a database links from a parent table to a sub-table. Values in the link field in the parent table are expected to be unique across all records in that table. Values in the corresponding link field in the child tables must match those in the parent table but it is possible to link multiple records from the child table to a single record in the parent table.

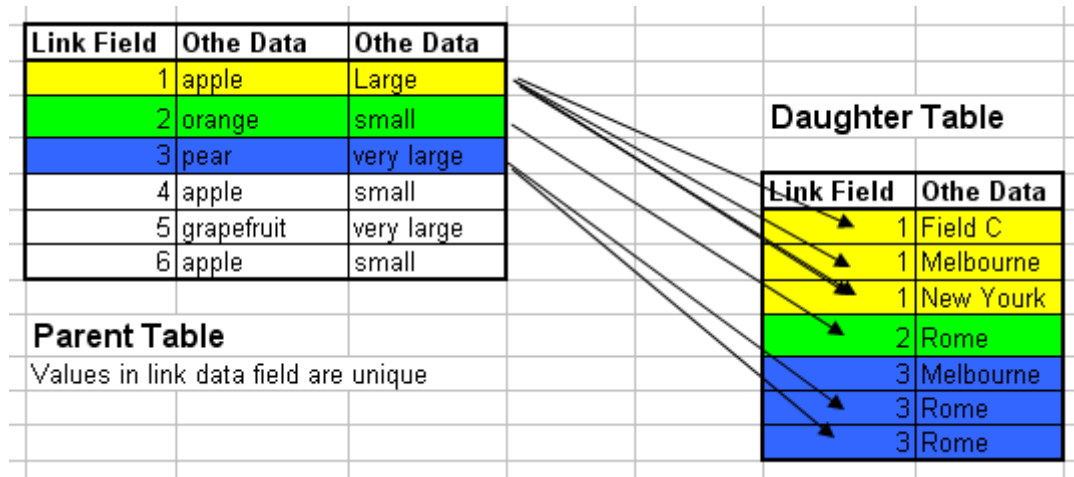


Figure 37a – Linking through common data values

The best way to ensure uniqueness of values in the link field is to rely on the custom forms auto values to insert unique values whenever a new record is created in the parent table. Use "incremental number" or better still "unique value" (refer to section 6.7.6 on how to set automatic field values). Set the auto population method for the parent table only. GBM Pro will automatically insert the correct value for the link data field into the child table when new sub-table records are created.

To create a form relationship:

1. From the Custom Forms Settings window, highlight the project folder on which to work, then click on "Manage Forms".
 The Forms Manager is displayed.
2. Click on "Relationships".
 The Edit Form Relationships window is displayed.

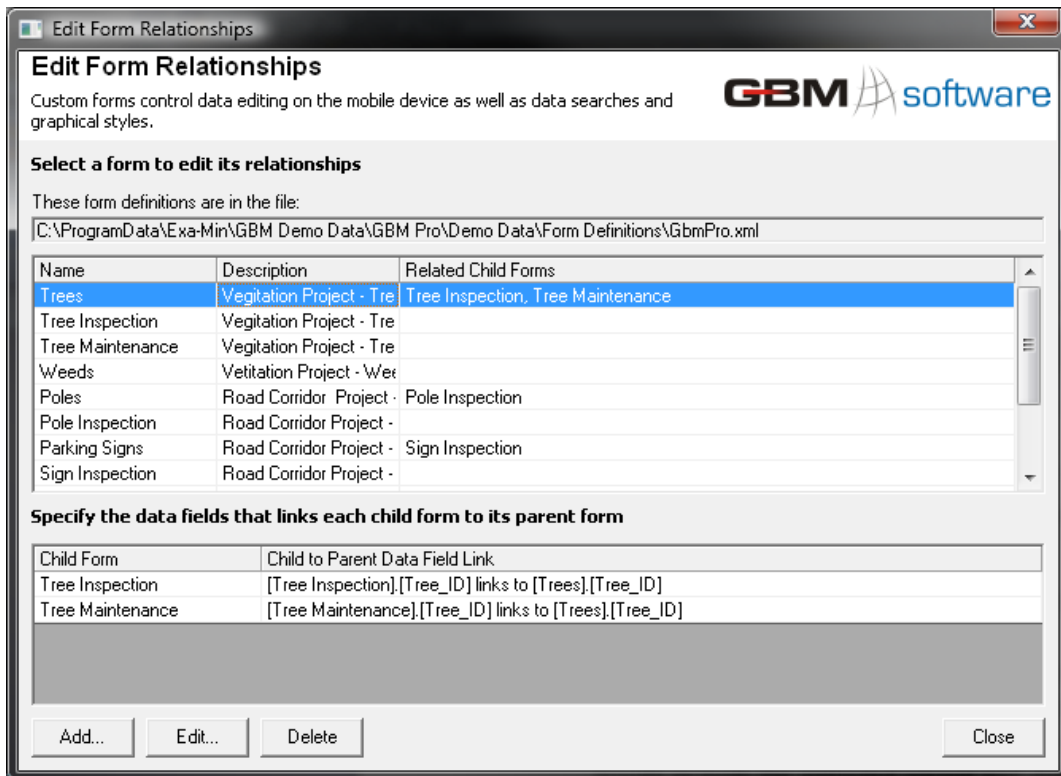


Figure 38 - 4Edit Form Relationships window

The Edit Form Relationships window shows the forms for the current project and the established relationships in the top half of the window. The lower part of the displays details of the selected form relationship (including the child to parent field links).

3. Select the required form to be the parent, then click "Add"
The Edit Relationship window displays (see Figure 38).

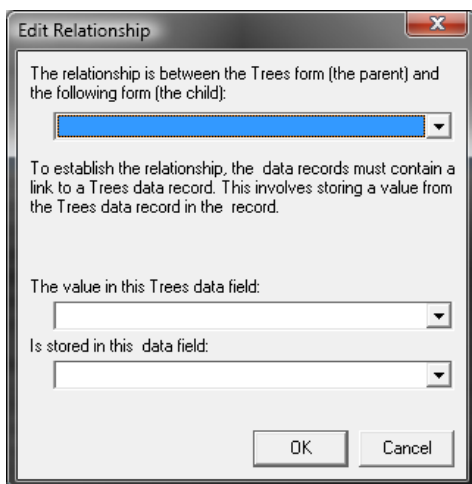


Figure 39 - Edit Relationship window.

4. Select the form which is to be the child relation from the top drop-down.
5. Select the fields which are to be linked from the lower two drop-down options.

Note: As discussed above, these fields will need to be identical in size and type.

6. Click "OK" to save the details.
Note how the newly created relationship now appears in the Edit Form Relationship window.

6.8.2. User Interface Details

The Edit Form Relationships window is used to establish hierarchical links between different forms and is reached from Manage Forms window.

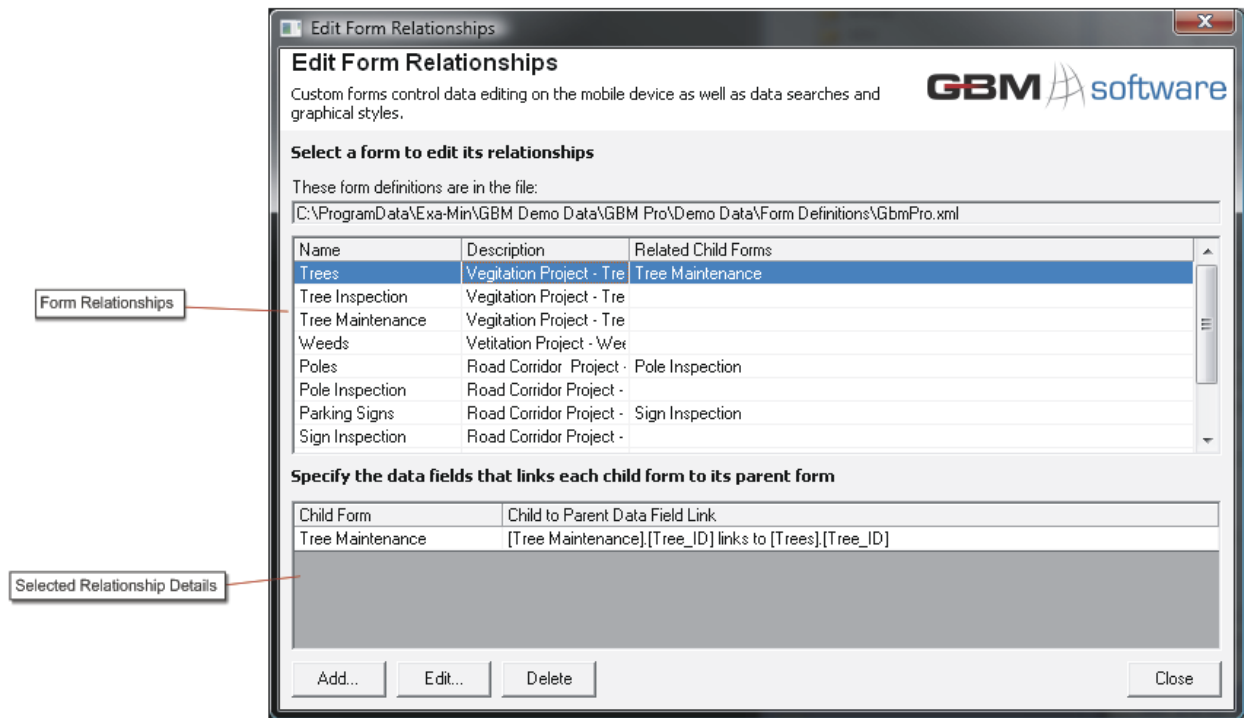


Figure 40 - Edit Form Relationships window.

The Edit Form Relationship window has the following elements:

Field Name	Type	Details
These form definitions are in the file:	Read-only	Displays the shared form definitions file for the project.
Form Relationships	List-box	Displays the list of forms and their related child entities.
Selected Relationship Details	List-box	Displays details of the relationship for the entry highlighted in the "Form Relationships" list.
Add	Button	Displays a blank window for the entry highlighted in the "Form Relationships" list. Select a form in the top panel before choosing this option.
Edit	Button	Allows editing of an existing relationship. Select an existing record in the lower panel before choosing this option.
Delete	Button	Deletes the relationship described in the entry selected from the bottom panel.
Close	Button	Closes the window.

The Edit Relationship window is used to establish parent to child relations between fields on different forms. It is opened from the Edit or Add button on the Edit Form Relationship window (above).



Figure 41 - Edit Relationship window.

The Edit Relationship window has the following elements:

Field Name	Type	Details
The relationship is between the <selected form> and the following form	Drop-down	Specifies the child form to link to. The list of forms is configured by the form definitions.
The value in this <Parent Form> data field	Drop-down	Specifies the name of the field in the parent form. Note: This must be the same type and length as the field selected in the child form.
Is stored in this <Child Form> data field	Drop-down	Specifies the name of the field which stores the data in the child form. Note: This must be the same type and length as the field selected from the parent form.
OK	Button	Saves the relationship configuration and closes the window.
Cancel	Button	Closes the window without saving any changes.

7 Troubleshooting Guide

This section provides some tips and technical details on how to troubleshoot GBM Pro.

Topics in this Section

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7.1. How does GBM Pro Work?

Custom Forms are core to GBM Pro operation. Forms are defined through the forms editor that is packaged with every license. Forms are managed from a central location and can be imported for use in GBM Pro, GBM Mobile or GBM Portable. Forms are not active in a MapInfo session until they have been imported into the current GBM Pro project.




GBM Pro works with MapInfo ".tab" data sets. The data may reside in native ".tab" files or may be linked or cached database references. All data (other than raster images) that can be opened by MapInfo Professional® may be displayed in GBM Pro Custom Forms.



The standard release of GBM Pro connects to external databases through linked MapInfo ".tab" files. GBM Office or special custom editions of GBM Pro can be provided for customers who need to link to external databases outside of the MapInfo® data provider framework (refer to the page iii for details on how to contact Exa-Min Technologies).

GBM Pro supports hierarchical data relationships similar to those defined by MapInfo Exponare® data binding. This technology allows a single map feature to be connected to multiple sets of attributes without requiring duplication of the map feature. A single map feature may be linked to multiple attribute sets that may reside in any number of separate .tab files.

7.2. Common Issue

The table below lists the most common troubleshooting issues for using GBM Pro. If your problem cannot be resolved, please see section 1.6 on how to get further help.

Issue	Cause	Resolution
 No objects found when selecting a map feature using the GBM Pro Attributes Tool.	<ul style="list-style-type: none"> The project that contains the required GBM Custom Forms may not be active in your GBM Pro session or the required forms may not have been imported into the project. The map feature may be on a non-selectable layer 	<ul style="list-style-type: none">  Open the Custom Forms Settings screen for further layer diagnostics. If necessary browse for the correct home folder and choose the appropriate GBM Pro Project. Check that the layer specified in the form definition is open in the current map window through the MapInfo Layer Control Window. If necessary set the layer as selectable through the MapInfo layer control window Check that the Window containing the destination map layer is the current map window If necessary edit the custom form to in the shared forms file to force it to re-read data structure from the .tab file. Then re-import the form into the current GBM Pro project.
Cannot draw or select required map feature; or map feature type is greyed out in the GBM Pro Draw window.	<ul style="list-style-type: none"> The layer specified by the form is not open in the current map window. The current GBM Pro Project does not contain the expected GBM Custom Forms. The custom form is expecting a data structure that is different from that of the .tab file currently open in 	<ul style="list-style-type: none">  Open the Custom Forms Settings screen for further layer diagnostics. If necessary browse for the correct home folder and choose the appropriate GBM Pro Project. Check that the layer specified in the form definition is open in the

Issue	Cause	Resolution
	<p>the map window.</p> <ul style="list-style-type: none"> The custom form may not be tagged for use with map drawing 	<p>current map window through the MapInfo Layer Control Window</p> <ul style="list-style-type: none"> Check that the Window containing the destination map layer is the current map window If necessary edit the custom form in the shared forms file to force it to re-read data structure from the .tab file. Then re-import the form into the current GBM Pro project. Open the shared form file in the forms editor and edit the relevant custom form. See that the check box on the Map Objects tab allows creation of new map features. Be sure to re-import the form into the current project after editing.
<p>Form status shown as unavailable even though a layer or the correct name is open in the current map. open.</p>	<p>This can occur when the structure of the .tab file open in the current map does not match that described in the custom form. Most likely causes are:</p> <ul style="list-style-type: none"> Changes to the .tab file structure that post date building of the form Opening a .tab file from a different project that has the expected layer name but unexpected data fields Importing forms into a project from a shared forms file that belongs to a different project that expects different data content. 	<ul style="list-style-type: none"> Refer to the MapInfo layers panel to review which layers are open on the active MapInfo map window.  Open the Custom Forms Settings screen for further layer diagnostics. Open the shared form file in the forms editor and edit the relevant custom form. See that the check box on the Map Objects tab allows creation of new map features. Be sure to re-import the form into the current project after editing.
<p>Forms Editor error message re XML file change.</p> <p>The message can be presented when exiting the forms manager after editing the shared forms file.</p>	<ul style="list-style-type: none"> Two forms editor sessions may have been attempting to edit the same shared forms file. The file is automatically saved on exit from the forms manager and the copy of form details in memory will replace the copy on disk. This can cause details in a shared form definition file to be overwritten in a similar fashion to when two operators save a Word document or spreadsheet to the same file name. 	<ul style="list-style-type: none"> Save the file to an alternate name. Close all edit sessions and re-open the files individually to establish which file has the current copy of individual forms. Forms can be transferred between shared forms files through the Transfer Forms function on the GBM Mobile Manager Administration tab. Forms transfer functions are not supported in GBM Pro.
<p>Edits to a custom form do not appear to have been saved or the form has been edited and changes are not reflected in the current session.</p>	<ul style="list-style-type: none"> Multiple sessions of the Forms editor were open at the same time and one session overwrote edits to the shared forms file made through a different program session. Changes may have been made correctly to the shared forms file but not imported into the current project. 	<ul style="list-style-type: none"> The forms editor reads all information into memory and rewrites the shared forms file on exit. If two sessions are open at the same time, changes made in one session may be overwritten when a second session rewrites the forms file from program memory. Be sure to open only one Forms Editor session.

8

Appendix 1 – End User License Agreement

Exa-Min Software and Data End User License Agreement

Capitalised terms used in this Agreement have the meanings assigned to them in Section 11(i) or elsewhere in this Agreement. The terms “you” and “your” refer to the entity or person who purchased this licence. “Exa-Min” or “We” “us” and “our” refer to Exa-Min Technologies Pty Limited.

1. **Licence Grant; Ownership.** Subject to your compliance with the terms and conditions of this Agreement (including the payment of all required fees), Exa-Min grants you a limited, non-exclusive, non-transferable right and licence to install and use the Products in accordance with the terms of this Agreement. We are not selling the Products to you. Exa-Min and its third party providers retain title to and ownership of the Products and Documentation and training materials. Exa-Min and its third party providers reserve all rights not expressly granted to you under this Agreement.
2. **Term; Termination.**
 - a. **Product Licences.** The term of the licence we grant to you for the Products is perpetual unless we expressly specify otherwise in this Agreement, on the Order Form, or in a written amendment to this Agreement.
 - b. **Maintenance and Update Subscriptions.** Your obligation to pay for Maintenance and our obligation to provide them will commence as of the Effective Date and continue for the term specified in the Order Form.
 - c. **Termination.** If you breach the terms of this Agreement and fail to cure the breach within thirty (30) days after you receive our written notice of the breach, this Agreement (including all licences granted hereunder) will terminate. When a licence for any Product terminates, you must destroy the Product and all copies and, if we request, certify to us in writing that you have done so.
 - d. **Limited Term Products.** The term of the licence we grant you for certain Products may be limited and will be specified on the Order Form (“Limited Term Products”). When the licence for a Limited Term Product expires, you must (i) stop using the Limited Term Product and remove all copies of it and any Derived Data based on it from all computers and Servers on which it has been installed, (ii) destroy all copies of the Limited Term Product in your possession.
3. **Use Rights.**
 - a. **Generally.** You may use the Products solely for your internal business purposes in accordance with the terms in this Agreement as they apply to the particular licence type specified on the Order Form. The Section entitled “Product-Specific Terms”, if appended to this document, contains special use rights and restrictions for particular Products.
 - b. **Named User Licences.** You may install and use Products on individual Devices or on a Server, so long as the number of Named User Devices on which you install the Products or the number of Named User individuals permitted to access the Products from the central Server does not exceed the number of Named Users specified on the Order Form. For PDA based products each mobile device on which the software is installed counts as one named user. In the case of GBM Mobile, each named user license permits installation of GBM Mobile Manager for Windows on a single Windows workstation and GBM Mobile on a single PDA.
 - c. **Server Licences. CPU Licences.** You may install the Products on one or more Servers so long as the number of CPUs in those Servers does not exceed the number of CPUs specified on the Order Form.
4. **Backup Copies/Installations.** You may make one copy of the Products solely for backup purposes. You must maintain Exa-Min and third party licensor information, including copyright notices, on backup copies and keep the copies in a secure location.

- If you have a Server Licence, you may install the Products on a backup Server to be used only when your main Server is inoperable and only so long as the number CPUs on the backup Server do not exceed what is licenced on the Order Form.
5. **General Use Restrictions.** You may not: (i) reverse engineer, decompile or disassemble the Products; (ii) make Derivative Works of the Software Products; (iii) make copies of the Products, except as permitted in Section 4; (iv) sub licence, rent, lease, lend or host the Products to or for other parties; (v) separate the components of Products or install and use such components separately and independently of the Products they comprise; (vi) use Products to translate a third party's products unless you have the legal right to do so; (vii) attempt to unlock or bypass any initialisation system, encryption methods or copy protection device we incorporate in the Products; (viii) alter, remove or obscure any patent, copyright or trademark notice contained in the Products; (ix) use the Products in a "concurrent use" or "floating licence" manner; or (x) use the Products in revenue-generating Internet-based services or applications for third parties or as an Application Service Provider.
 6. **Use and Restrictions: Data Products.** These data use restrictions apply only to data supplied as part of the product. This includes data supplied with the embedded MapInfo components and data provided for training and product demonstration. This agreement does not seek to restrict you from working with or distributing data acquired from other sources.
 - a. **Data Use Rights.** Subject to the restrictions in Section 6(b), you may use Data Products to produce Data Output for your internal business purposes and you may deliver the Data Output to third parties solely to market your products or services subject to the restrictions in Section 6(b) below. You must prohibit those third parties from selling, sublicensing or disclosing the Data Output to additional third parties and from using the Data Output for any purpose other than evaluating your products or services. You may use Data Products to derive conclusions or recommendations that form part of your services to third parties, but you may not provide Data Output or Data Products as part of those services. Notwithstanding Section 5, you may translate Data Products into other data formats so long as your use of the Data Products in all formats does not exceed the limits of this Agreement.
 - b. **Data Use Restrictions.** You may not: (i) give third parties access to the Data Products or perform services for third parties using the Data Products on a Service Bureau basis; (ii) distribute or display to any third party the numerical cluster codes or the longitude and latitude or "x,y" coordinates contained in the Data Output; (iii) sell or provide Data Output to third parties as part of your products or services unless you and we agree in writing; (iv) download to a desktop computer or client-side machine any Data Products or portions of Data Products that you have licensed from us on a Server Licence.
 7. Updates; Maintenance; Technical Support; Services.
 - a. **Software Maintenance.** If you have purchased Maintenance and paid the annual Maintenance fees for particular software Products, Exa-Min will deliver updates and upgrades to those Products as they become commercially available. We do not guarantee that we will update or upgrade software Products on any particular schedule. Upon delivery, updates and upgrades will be considered "Products" for all purposes hereunder. Updates and upgrades replace Products that you initially licensed from us and that made you eligible for the update or upgrade.
 - b. **Services.** Exa-Min will provide basic services such as pre-installation preparation, on-site installation and post-installation review as set forth in the Order Form ("Services"). Enhanced customisation or software development services require a separate professional services agreement. Exa-Min retains all right, title and interest in and to all intellectual property that it generates, conceives or develops as part of the Services, including, without limitation, inventions conceived or reduced to practice and any resulting patents, and any works of authorship in any form of expression including, without limitation, manuals and software ("Exa-Min Materials"). Your use of Exa-Min Materials is subject to all the restrictions applicable to Products. Any changes to the Services must be approved by both parties in writing and may involve an increase in cost or time estimated to complete Services
 8. Warranties.
 - a. **Limited Product Warranty.** We warrant that the media containing the Products will be free from material defects for a period of ninety (90) days from the date we ship the Products to you. To the maximum extent permitted by law, any warranties that the law imposes will be similarly limited in scope and duration. This warranty does not apply if the defects result from accident or abuse by someone other than us. If you notify us during the warranty period that a Product does not satisfy this warranty, then we may elect to either return to you the initial price you paid for the licence, or repair or replace the Product. To the maximum extent permitted by law, this is your exclusive remedy for the failure of any Product to meet this warranty.
 - b. **DISCLAIMER.** WE DO NOT WARRANT THAT THE PRODUCTS WILL OPERATE ERROR-FREE OR THAT WE WILL CORRECT ALL PRODUCT ERRORS. TO THE EXTENT PERMITTED BY APPLICABLE LAW, WE DISCLAIM AND EXCLUDE ALL REPRESENTATIONS, WARRANTIES AND CONDITIONS WITH RESPECT TO PRODUCTS, WHETHER EXPRESS, IMPLIED OR STATUTORY, OTHER THAN THOSE EXPRESSLY IDENTIFIED IN THIS AGREEMENT, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF NON-INFRINGEMENT, TITLE, SATISFACTORY QUALITY, ACCURACY, RELIABILITY, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE. OUR ENTIRE LIABILITY, AND YOUR ONLY REMEDY, FOR A BREACH OF A WARRANTY WILL BE EITHER CORRECTION OF THE PRODUCT ERROR THAT CAUSED THE BREACH, OR RETURN OF THE LICENCE FEES YOU PAID FOR THE PRODUCT OR SERVICES IF APPLICABLE.
 9. Indemnification; Liability.
 - a. **Indemnification.** We will assist your defence against any claim by an unaffiliated third party that the Products infringe that party's patent, copyright or other intellectual property right issued and existing as of the Effective Date. We will not be obligated under this section if the infringement results from: (i) your use of a previous version of a Product and would have been avoided had you used the current version of the Product; (ii) your combining the Products with devices or products not provided by Exa-Min, (iii) use of the Products in applications, business environments or processes for which the Products were not designed or contemplated, and where use of the Products outside such application, environment or business process would

not have given rise to the claim, (iv) corrections, modifications, alterations or enhancements that you make to the Product; (v) use of the Products by any person or entity other than you or your employees; or (vi) your wilful infringement.

If we believe a Product may be or is subject to an infringement claim, or if a court of competent jurisdiction enjoins your use of a Product as a result of an infringement claim, we may, at our expense and our discretion: (a) procure for you the right to continue using the Product; (b) modify the Product to make it non-infringing; or (c) replace it with a functional non-infringing equivalent. If we believe that none of these options is reasonably available, then we may terminate the licence to the allegedly infringing Product and our sole liability will be to refund to you the licence fees you paid for such Products, prorated over a two (2) year period from the date of their delivery to you.

You will defend and indemnify Exa-Min and its third party licensors from any and all liabilities, damages, losses, expenses, demands, claims, suits or judgments, including reasonable attorneys' fees, costs and expenses arising from your unauthorised use of any Product. Neither Exa-Min nor its third party licensors will be responsible for any direct or indirect loss or damage that may result from such unauthorised use.

b. LIMITATION OF LIABILITY. SUBJECT TO SECTION 10(d), EXA-MIN AND ITS THIRD PARTY LICENSORS WILL NOT BE LIABLE IN ANY EVENT TO YOU OR ANY OTHER PERSON, REGARDLESS OF THE CAUSE, FOR: (I) THE EFFECTIVENESS OR ACCURACY OF THE PRODUCTS; (II) THE COST OF PROCURING REPLACEMENT GOODS OR SERVICES; (III) LOST PROFITS OR LOST SALES; OR (III) ANY SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE, EXEMPLARY, MULTIPLE OR CONSEQUENTIAL DAMAGES; ARISING FROM OR OCCASIONED BY YOUR USE OF THE PRODUCTS, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

c. MAXIMUM LIABILITY. SUBJECT TO SECTION 10(d), IN ANY EVENT, EXA-MIN'S MAXIMUM LIABILITY FOR ANY CLAIM ARISING IN CONNECTION WITH THE PRODUCTS WILL NOT EXCEED THE LICENCE FEES YOU HAVE PAID WITH RESPECT TO THE PRODUCTS AT ISSUE.

d. Nothing in this Agreement shall exclude or restrict either party's liability for any cause of action which cannot be limited or excluded under applicable law.

e. APPLICABILITY OF DISCLAIMERS AND LIMITATIONS. You agree that Exa-Min has set its prices and entered into this Agreement in reliance upon the disclaimers and limitations in this section and that these disclaimers and limitations allocate risk between you and Exa-Min and are an essential part of the bargain between us.

10. **Audit/Reporting.** Upon five (5) business days written notice, we may audit your use of the Products at your place(s) of business during normal working hours. Additionally, within thirty (30) days after receiving our written request, you will give us a written certification, in a form that we provide and signed by an officer of your organisation that you are complying with this Agreement. Exa-Min will make no more than one audit and/or one certification request in any twelve (12) month period. If our audit or your certification reveals that your actual use of the Products exceeds your licensed use or is otherwise not compliant with this Agreement, you will purchase Product licences for your unlicensed use and, if the excess is greater than five per cent (5%), pay all our reasonable costs related to the audit.

11. **Miscellaneous.**

a. Entire Agreement; Amendment. This Agreement and the documents referred to in this Agreement, including the Order Form, constitute the entire and only agreement and understanding between the parties relating to the Products and supersedes all prior or contemporaneous agreements. The terms of this Agreement supersede the terms in any purchase order or other document you give us. This agreement may be modified only in a writing signed by you and Exa-Min.

b. Governing Law. The laws of the State of New South Wales, Australia will govern this contract and any interpretation of it. New South Wales, Australia's principles of conflicts of law and the U.N. Convention on Contracts for the International Sale of Goods will not apply. You agree to the exclusive jurisdiction of the Courts of New South Wales and the Courts of Appeal from them for resolution of any dispute related to this Agreement.

c. Waiver; Severability. Either party's failure to enforce any provision of this Agreement will not constitute a waiver of the provision or of the party's right to enforce the provision. If any provision of this Agreement is held invalid or unenforceable, the remainder of the Agreement will not be affected or impaired in any way. If the provision in question would be valid or enforceable if modified, then the provision will apply with the modification necessary to make it valid and enforceable.

d. Notices. Any notices sent to a party to this Agreement must be in writing, addressed to the party at the address on the Order Form or any other address that the party specifies from time to time, and will be deemed given if delivered personally, via facsimile, regular mail, nationally-recognised overnight courier or by registered or certified mail. Notices will be deemed received in the case of personal delivery or facsimile on the date when delivered or faxed, in the case of overnight courier on the date delivered, and in the case of regular, registered or certified mail three (3) days after deposit with the postal service.

e. Assignment. You may not assign, sublicense or transfer your rights or delegate your obligations under this Agreement without our written consent. Any attempt by you to transfer this Agreement without our consent will be void, the transferee will acquire no rights whatsoever, and Exa-Min will not be required to recognise the transfer. This provision limits both the right and the power to transfer this Agreement and the rights hereunder.

f. Force Majeure. Exa-Min will not be deemed in default under this Agreement as a result of any delay in the performance of its obligations due to causes beyond its reasonable control.

g. Export. You agree not to export, re-export, or provide the Products to (i) any country to which the United States has embargoed goods; (ii) any person on the U.S. Treasury Department's list of Specially Designated Nationals; (iii) any person or entity on the U.S. Commerce Department's Denied Persons List; or (iv) any person or entity where such export, re-export or provision violates any U.S. Export control or regulation.

h. U.S. Government Restricted Rights. If you are an agency of the United States Government, you agree that Product(s) are “commercial computer software” or “commercial computer software documentation” and the Government's rights with respect to such software documentation are limited by the terms of this Licence Agreement, pursuant to FAR § 12.212(a) and/or DFARS § 227.7202-1(a), as applicable.

i. Definitions. “**Application Service Provider**” means an entity or person who hosts a computer application and provides third parties access to its functionality over the Internet or other network. “**CPU**” means a central processing unit in a computer regardless of its megahertz capacity. “**Data Products**” means those sets of compiled data that you licence from Exa-Min and are supplied as part of the licensed software product. Data Products include but are not restricted to data provided for documentation, demonstration or training purposes. Data products do not include data that is subject to separate licensing agreements whether that data was or was not listed on the Order Form. “**Data Output**” means the maps, reports or other information that you generate by analysing or processing Data Products, including geocode coordinates or cluster segmentation assignments appended to your database records. “**Data Updates**” means replacement or additions that we provide for Data Products. “**Derived Data**” means the result generated by combining, or performing mathematical calculations on, variables or fields of Data Products, extracting subsets of Data Products, and combining Data Products or portions of them with your data or third party data. “**Derivative Works**” means a work that is based upon, or that translates, recasts or adapts a Product. “**Device**” means a single personal computer, laptop, workstation, terminal, personal digital assistant, or other computing device. “**Documentation**” means the user documentation that accompanies the Products. “**Effective Date**” means the date when the parties entered into this Agreement. “**Maintenance**” means Exa-Min’s delivery to you of updates or upgrades to Software Products as they become commercially available. “**Named User**” means a single named person or a Device. “**Order Form**” means the order form attached to this licence or other ordering documentation such as your purchase order. “**Products**” means the Software Products or Data Products we licence to you under this Agreement. “**Server**” means a computer with one or more central processing units that provides services to other computers over a network. “**Server Licence**” means a Power Unit, CPU or SAU licence. “**Service Bureau**” means a data processing center performing processing, cleansing, analysis and other services on data for third parties. “**Single Application User**” or “**SAU**” means a single named person or Device authorised to access a single application. “**Software Products**” means the object code form of executable computer programs that Exa-Min licences to you under this Agreement.

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