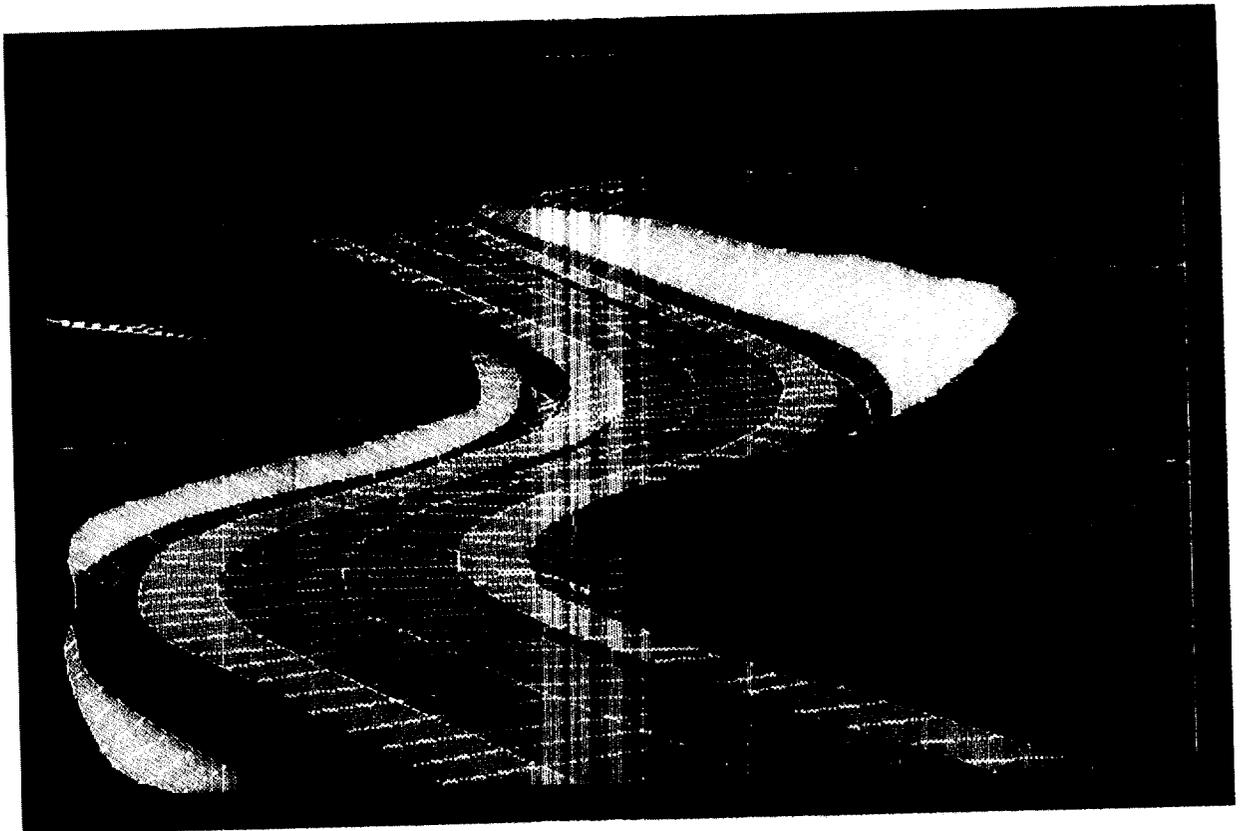
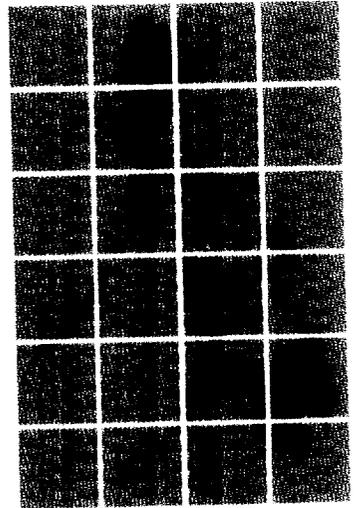


RMS

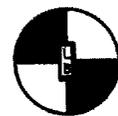
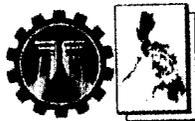
ROAD MAPPING SYSTEM

User's Manual



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
RURAL INFRASTRUCTURE FUND PROJECT

CADD MAPPING PROJECT



LOUIS BERGER INTERNATIONAL

In coordination with

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

PN-ABX-985

R M S

Road Mapping System

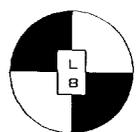
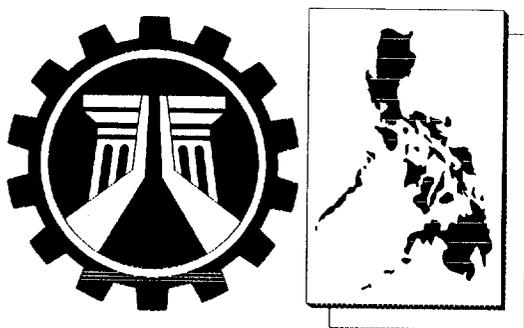
User's Manual

**REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
RURAL INFRASTRUCTURE FUND PROJECT
PROJECT NO. 492-0420**

**TECHNICAL ASSISTANCE TO THE DPWH
FOR AN INTEGRATED CADD MAPPING
AND DATA MANAGEMENT SYSTEM
(CONTRACT NO. 492-0420-C-00-2173-00)**

**DPWH ROAD MAPPING SYSTEM
USER 'S MANUAL**

This (Activity) was completed through the assistance of the United States Agency for International Development (A.I.D.). The views, expressions and opinions contained in this report are the author's and are not intended as statements of policy of either A.I.D. or the author's parent institution.



LOUIS BERGER INTERNATIONAL, INC.



in coordination with

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

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CHAPTER 1

INTRODUCTION

This manual is the user documentation for the DPWH Road Mapping System (RMS). The RMS is a computer program and associated data files which enable maps and data tables of the Philippine road network to be easily produced and output.

At the most basic level, the RMS can be used to prepare standard road maps of a province. Such a map typically has lines indicating the alignments of the roads in the province's network, and also shows all or some of a province's population centers with appropriate symbols. With RMS a user can choose the class or classes of the network (national, provincial, barangay or other) and the administrative levels of the population centers (barangays, municipalities, chartered cities, provincial capitals) to be shown. Maps can be prepared of a single province or of groups of provinces.

The RMS can also be used to present information about road characteristics (pavement width or pavement type, for example) by drawing a road map using line types or colors which vary according to the roads' characteristics. For example, a user could prepare a map of road widths with lines whose thickness was related to the width of a road, or a map of pavement type with lines whose color was related to the type. The map legend would explain the correspondence between the line properties (type or color) and the road features. Maps which display information in addition to basic geographic data such as road alignments are called *thematic maps*. The user can choose to present various road characteristics in a standardized fashion defined by the RMS, or can define a customized thematic presentation of the data to suit his own needs or purposes.

Although the RMS is primarily a mapping system, it can also prepare tables and reports of road data which can then be printed out or transferred to other systems.

RMS runs as part of MapInfo for Windows, which is a general-purpose mapping program. It inherits many features from both Microsoft Windows and Mapinfo for Windows. In addition, RMS provides MapInfo¹ with capabilities specifically tailored to preparing standard and thematic maps and tables of road data. While it is not necessary to know all of Windows' or MapInfo's features and commands before using the RMS, familiarity with Windows and MapInfo can only enhance a user's productivity with the RMS. This document provides a brief introduction to the two systems, but of course the best way of becoming familiar with it is through the various Windows and MapInfo tutorials, guides and manuals. Both systems require familiarity with a minimum number of basic concepts; once these are understood, they are easy to learn and use.

¹ Although there are several versions of MapInfo, every reference to MapInfo in this document should be understood as implying MapInfo for Windows.

This user documentation describes how an end user can use the RMS to carry out mapping, data display and analysis work. The system is designed to be usable by persons without extensive computer experience. In addition to thoroughly describing the RMS system capabilities themselves, this manual attempts to clarify general points which might confuse a relatively novice computer user encountering MapInfo or Windows for the first time.

The remainder of the document is organized as follows:

- Chapter 2 is a general overview of RMS concepts. It explains the way in which road maps and data are stored and manipulated in the RMS and establishes the vocabulary and ideas used in the remainder of the documentation;
- Chapter 3 is a brief introduction to those features of Windows and MapInfo which are most useful in the RMS. As stated above, this introduction is not intended as a substitute for the Windows or MapInfo documentation itself;
- most user interaction with the RMS is through a series of menus which provide the means of indicating what is to be done. Each of the remaining chapters is devoted to one of the RMS menus. Each chapter explains what the corresponding menu is used for and how to select the various options and capabilities which each menu provides.

CHAPTER 2

RMS SYSTEM CONCEPTS

2.1 TYPES OF DATA AVAILABLE IN THE RMS

The DPWH RMS contains the following data for each province of the Philippines:

- provincial boundaries;
- population centers; these include the provincial capital or capital city, chartered cities, municipalities and barangays. Barangays and municipalities are located on maps in terms of their poblacion (seat of government or administration). Some barangays and a few municipalities may be missing if it was not possible to locate them from original map sources, because of place name changes for example. The RMS stores the following information about each population center:
 - its name according to official National Statistical Office (NSO) lists;
 - its official NSO identification code;
 - a code indicating the administrative type of the population center as follows:

1	-	provincial capital which is a chartered city;
2	-	provincial capital, but not a chartered city;
3	-	chartered city;
4	-	municipality;
5	-	barangay.

All of this information is accessible through the RMS. For example, information on population center names can be used to label centers on a map, and information on NSO codes can be used to relate the population centers to corresponding statistical data (population and household data, for example);

- roads; in general, all rural national, provincial and barangay roads longer than approximately one kilometer² will appear in the RMS. National and provincial roads will generally be identified in terms of their DPWH road

² The actual minimum length of road in a province depends on the scale of the original hardcopy maps which were digitized to obtain the province road maps. The scale of the original maps vary from province to province.

number and will have stationing information associated with them; barangay roads will in general not be identified nor have stationing information. Roads in built-up areas will also generally not be shown. Road numbers and stationing data can be displayed and also used as a basis for organizing and analyzing other data.

- road feature data; at the present time, information on pavement type and width is available from the DPWH for most national roads; data on pavement type is available from the DPWH for most provincial roads. This data is accessible through the RMS. Other types of data may be added in the future by RMS maintenance staff, as road inventory or other road data collection activities are carried out. (The RMS can provide a list and description of available road feature data stored in the system.) Road feature data can be used for thematic mapping, can be printed out, or can be combined with other data for analysis, as described in later chapters.

End users would not normally be concerned with details of where or how the above data is stored in the system. The RMS facilitates controlled access to the above data and provides capabilities for examining, reporting and analyzing it. Similarly, end users would not add new or updated road or feature data to the system; this task is the responsibility of the RMS maintenance staff.

All geographic data (e.g., provincial boundaries, population centers and roads) are referenced to Zone 51 of the Universal Transverse Mercator (UTM) projection. In other words, the coordinates of any location in the system are that location's UTM Zone 51 easting and northing; these coordinates can be displayed by setting the appropriate RMS options.

2.2 ADDITIONAL DETAILS ON ROAD AND ROAD FEATURE DATA

In RMS terminology, *road data* refers to information on road alignments and identification. In the RMS a road is identified by the province in which it is located and by a DPWH identification code. The province is designated by a two-digit code assigned by the National Statistical Office. Road identification codes are those used internally by the DPWH; on National roads these are often the (basically numeric) codes assigned by the 1983 Road Inventory System effort and used, with some modifications and extensions, since then. Provincial and other roads have been assigned codes in sequential numerical order based on the road names.

Within the RMS, a road is represented as a number of individual *segments*. A segment has information about its province and road identifier, and about the stationing of its two endpoints. Segment endpoints are typically intersections of the road with other roads, with the provincial boundary, or are the actual beginning or ending points of the road. A location along a road is indicated by providing the province/road identification codes and the stationing of the location; the RMS interpolates between fixed locations along the road having known stationing (these are called *control points*) to determine the geographic location corresponding to the provided stationing.

Road feature data, on the other hand, provides information about road characteristics. In RMS terminology, a *road feature* refers to a particular aspect of a road, of the roadside, of the road environment or of road users that can be described by one or more feature *attributes*. Road cross-section characteristics, for example, might be a road feature described by attributes such as pavement width, shoulder width, right of way, and so on. Each feature is essentially independent of all other features.

Road feature data is stored in the RMS by indicating the province code, road identifier, and beginning and ending stationings of a section of road having constant attributes for one particular road feature, together with the values of the feature attributes for the section. Such a stretch of road is called a *homogeneous section* for the feature. The following hypothetical example illustrates the organization of road feature data in the RMS. It shows two different road features, lanes and traffic. The lanes feature consists of a single attribute, the number of lanes; the traffic feature consists of two attributes, AADT (annual average daily traffic) and the truck percentage.

Feature: Lanes

Province	Road	Beginning	End	# Lanes
10	0001	KP 0	KP 10	2
10	0001	KP 10	KP 20	4

Feature: Traffic

Province	Road	Beginning	End	AADT	% Trucks
10	0001	KP 0	KP 5	10,000	20
10	0001	KP 5	KP 15	20,000	15
10	0001	KP 15	KP 20	20,000	10

The example shows a single 20 kilometer-long road having the identifier 0001 and located in province 10. With respect to the lanes feature, the road consists of two homogeneous sections, one from kilometer point (KP) 0 to 10 with two lanes, and the other from KP 10 to 20 with four lanes. With respect to the traffic feature, the road consists of three homogeneous sections, as shown in the table. Note that although the AADT is constant between KP 5 and KP 20, there is a change in the truck percentage at KP 15 requiring the creation of a new homogeneous section. A homogeneous section must have constant values for all the attributes associated with a feature.

All the feature data discussed above was *linear* in nature: the road characteristics extended over a stretch of road having non-zero length. Not all road feature data is linear, however; accident data, signage data, minor structure inventory data are all examples of data which can more appropriately be considered as *point-like*. The RMS handles point data by simply requiring that such data have the same beginning and ending kilometer point stationings. The key RMS operations described below (feature merging and dynamic segmentation) work

correctly whether linear or point-like data is involved. However, all attributes of a feature must be either linear or point-like; a single feature cannot include both types of attributes.

2.3 FEATURE MERGING

Although road features are essentially independent of each other, at times it is useful to be able to combine two or more different features into a single new feature which pulls together the data about each individual feature. To pursue the above example, it may be of interest to combine information on number of lanes and traffic into a single new feature so that width and traffic information could be analyzed together. The process of combining two or more independent features into a new feature is called *feature merging*; it involves two related operations:

- first, the homogeneous sections of the individual features have to be broken down into sections which are homogeneous with respect to all attributes; the new sections would typically be shorter in length than the sections in any of the individual features;
- next, the attribute values of the individual features have to be copied over to the output feature sections.

The following table illustrates the result of merging the lanes and traffic features discussed above.

Feature: Lanes x Traffic

Province	Road	Beginning	End	# Lanes	AADT	% Trucks
10	0001	KP 0	KP 5	2	10,000	20
10	0001	KP 5	KP 10	2	20,000	15
10	0001	KP 10	KP 15	4	20,000	15
10	0001	KP 15	KP 20	4	20,000	10

The RMS has the ability to do feature merging on any combination of features known to the system. The result of the feature merging operation is itself a feature which can be used like any other feature in the RMS; it is called a *synthetic feature* to indicate that it was created from data about other features. A synthetic feature can be thematically mapped, printed out in tabular form and analyzed using any of the RMS tools provided for these purposes. However, the merged feature data is not permanently stored. Once the RMS is exited, the merged feature data is lost. To work with the combined data again in another RMS session, the feature merging operation would have to be repeated.

As stated above, feature merging can be carried out using features which are either linear or point-like. In the synthetic feature, the attributes for the point-like feature(s) will have values equal to 0 at locations where the point-like feature is not present.

2.4 DYNAMIC SEGMENTATION

As was stated above, the RMS represents a road as a sequence of individual segments, where segment endpoints are generally determined by the road's intersections with other roads or with locations such as provincial boundaries. The stationing of each segment's endpoints is recorded in the RMS base data files. However, homogeneous section endpoints will not in general coincide with segment endpoints; in other words, the beginning and ending stationings of homogeneous sections, as recorded in the road feature data, may well be located between two road intersections or other segment endpoints.

In order for road feature data to be thematically mapped, the RMS has to generate a new set of road data in which the road segments coincide with homogeneous sections for the selected feature data: in general, mapping systems work with entire segments and cannot, for example, shade part of a segment. The procedure by which segments are automatically generated to correspond to homogeneous sections of feature data is known as *dynamic segmentation*. The new segments can then be drawn with various line types or colors based on the underlying attribute data. Without dynamic segmentation it would not be possible visualize feature data.

Dynamic segmentation with point-like feature data results in the creation of points rather than segments in the output. The points have the appropriate attribute data associated with them, and MapInfo and the RMS allow points to be thematically shaded, just as segments can be.

The RMS does not permanently store the new road data which results from a dynamic segmentation operation. Each time a user wishes to thematically map road feature data, dynamic segmentation must be performed anew. However, the results of dynamic segmentation are maintained throughout an RMS session, as long as the selected provinces do not change. Thus, a user can perform dynamic segmentation on a number of individual features and re-use the results within a session without having to carry out dynamic segmentation again. However, changing the province selection causes all earlier dynamic segmentation results to be erased.

CHAPTER 3

INTRODUCTION TO MAPINFO FOR WINDOWS

3.1 INTRODUCTION

As stated earlier, the DPWH Road Mapping System runs within the mapping program called MapInfo for Windows. It enhances MapInfo with capabilities specifically useful in the mapping and analysis of road and road feature data. However, many of the operations and capabilities of RMS are directly derived from those provided by MapInfo. Thus, it is necessary to know something — but not everything — about how to use MapInfo in order to be an effective user of the RMS. Similarly, familiarity with some of the basic Windows manipulations will facilitate use of MapInfo and the RMS.

The objective of this chapter is to give a brief overview of the principal aspects of MapInfo for Windows that relate to the use of the RMS. It does not attempt to be a substitute for the original MapInfo documentation contained in the four documents, Getting Started, User's Guide, Reference and Release Notes. Rather, the intent is to provide a "quick start" which will get a novice user to the point where he or she can use the RMS to do work. Following the "quick start", a user will find it very instructive to turn to the MapInfo documentation to more thoroughly learn the capabilities of the system.

Many of the MapInfo commands are accessed through a series of menus located at the top of the computer screen. In the RMS most of the original MapInfo menus have been replaced by a new set of menus tailored to the specific requirements of road mapping and data analysis. The RMS menus will be discussed in detail in separate chapters below. This chapter will focus on more general components of the MapInfo system — starting MapInfo and the RMS.

3.2 STARTING AND ENDING MAPINFO AND THE RMS

All computer systems on which the RMS has been installed should have been set up in a standard way; the setup process involves installation and configuration of Windows, MapInfo and the RMS itself. Users should not attempt to modify the configuration of these programs.

To start MapInfo from the DOS environment, type the following command from the keyboard at the DOS prompt³:

```
WIN MAPINFOW
```

³ All information (text or key presses) to be typed in by the user from the keyboard will be shown in this manual using THIS FONT.

This command starts up the Windows environment and immediately executes MapInfo for Windows. Once MapInfo is in control, you can load the RMS using the RUN from the File menu.

To start RMS from the Windows environment, double click⁴ with the mouse on the RMS icon. This will start up MapInfo for Windows, which will automatically load and begin to execute the RMS.

Selecting the Exit⁵ menu in RMS indicates that the user has finished work. When RMS shuts down, it also shuts down MapInfo and leaves the user in the Windows environment. An alternative way to leave the RMS and MapInfo is by typing

ALT-F4

from the keyboard⁶; this also leaves the user in the Windows environment. The easiest way to exit Windows is by again typing ALT-F4, which will return to the DOS environment.

3.3 GENERAL WINDOWS MANIPULATIONS

Because MapInfo runs within the Microsoft Windows operating environment, most of the information which appears on the screen during use of MapInfo or the RMS is organized into *windows*. Windows are objects which can be manipulated in certain predefined ways. MapInfo provides particular types of windows such as Mappers and Browsers with specific properties; but almost all windows can also be manipulated in certain standard ways: they can be opened or closed, moved around the screen, resized and so on. Once a user has learned to perform these standard operations on one type of window, the knowledge that has been gained can be applied with little or no change to other types of windows.

This section briefly discusses some of the standard ways of manipulating windows. Many books have been written on the subject of Microsoft Windows, which defines most of the standard window behaviors. Serious users will want to consult such books to improve their knowledge of the system.

⁴ To *double-click* on something means to position the mouse cursor over it and to click the left mouse button twice in rapid succession. Double-clicking is a standard way of executing a program or loading a data file in Windows.

⁵ Menu names will appear in underlined text while menu items (the components of a menu which appear when a menu is clicked on) will appear in **bold text**. A particular menu item appearing in a particular menu will sometimes be designated as Menu|**Menu Item**.

⁶ The notation ALT-F4 means to push and hold down the ALT key (which is usually found on the lower row of the keyboard) and, while holding it down, to also push the F4 function key (located either on the top row of the keyboard, or in a separate group of function keys located to the left of the letter and number keys.) Then both keys are released; they don't have to be released at the same time.

3.3.1 Parts of a Window

Figure 1 displays a typical window. The following components of the window will be discussed in the following sections; readers may want to refer back to this figure to see where each of these is located:

- title bar;
- window resizing bars/corners;
- maximize/minimize/restore buttons;
- control menu box; and
- scroll bars/box/arrow.

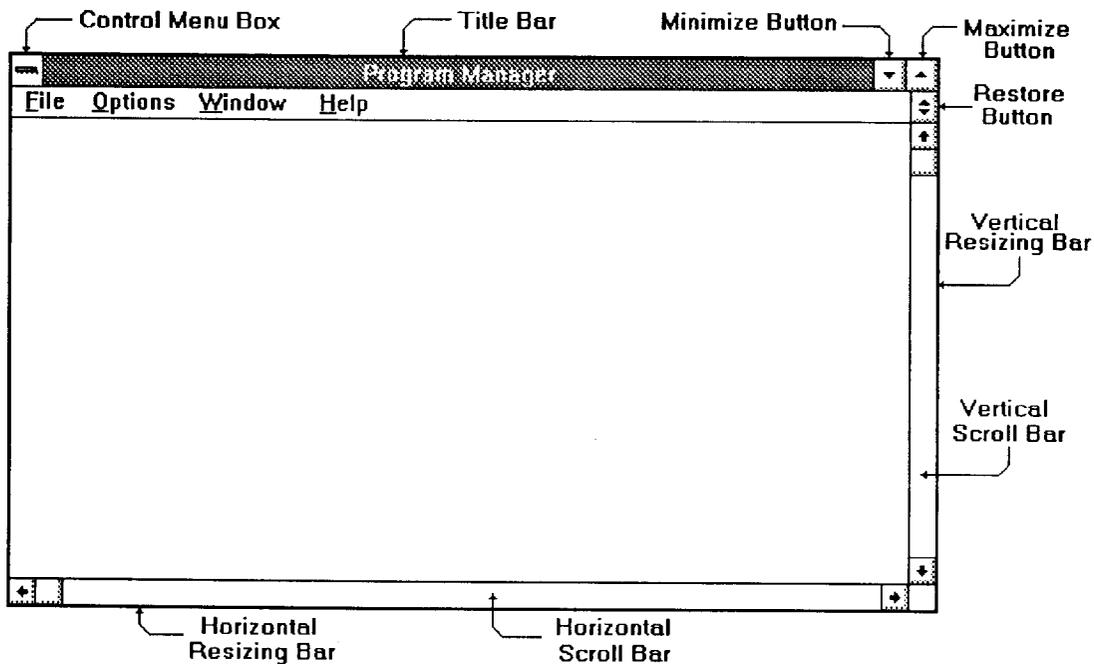


Figure 1

3.3.2 Standard Windows Operations

The following paragraphs describe some of the standard windows operations that are likely to be of use to RMS users. Emphasis is on use of a mouse to carry out the operations because this is generally the most easy-to-learn and natural method. Most of these operations can also be carried out through keyboard commands. Reference guides to Microsoft Windows explain the keyboard techniques. Serious RMS, MapInfo and Windows users will want to become familiar with both types of method so that the most appropriate and efficient operation technique can be used at all times.

3.3.2.1 Activating a Window

There may be a number of windows visible on the computer screen. However, only one

window can be *active* at any given time. The active window is indicated by a highlighted title bar and is always located "on top of" other windows which it may partially cover. To make a particular window active, it suffices to click on any portion of the window that appears on the screen. Making the window active may involve a reshuffling and redrawing of the various windows on the screen. An hourglass icon will generally appear while this is taking place.⁷ The previous active window becomes inactive, but no information is lost; it is simply put in suspension until activated again.

3.3.2.2 Moving a Window

To move a window, drag the window's title bar to the desired position. In Windows terminology, to *drag* an object means the following sequence of steps. Point (position) the mouse cursor at the object to be dragged. When the mouse cursor is properly positioned, push and hold down the left mouse button. While keeping the left mouse button held down, move the mouse in the direction which it is desired to move the object; the object's image on the screen will also move. When the object is in the desired location on the screen, release the left mouse button. The object will remain in the final position. As before, portions of the screen may need to be redrawn after an object is dragged to a new location. If so, an hourglass icon will appear on the screen while the redraw takes place; the icon will revert to the normal cursor shape when the redraw is complete.

3.3.2.3 Resizing a Window

It sometimes happens that the default length and width of a partial-screen window are not suitable for the work at hand. It is possible to change these using the mouse. Position the mouse cursor over the horizontal or vertical resizing bars. (*Resizing bars* are the central portions of a window's horizontal or vertical borders.) When the cursor is in the proper position for resizing the window, it will change into a characteristic double arrow. At this point, drag the horizontal or vertical bar so that the window assumes the desired dimensions (either larger or smaller than the original window.) To resize a window in the vertical and horizontal dimensions simultaneously, position the mouse cursor over the appropriate resizing corner and drag it to the desired position. (*Resizing corners* are the non-central portions of a window's horizontal or vertical borders. They are marked off by small lines across the borders and near the corners.)

3.3.2.4 Maximizing or Minimizing a Window

To *maximize* a window means to draw it so that it occupies the entire computer screen. This can be done by clicking with the left mouse button on the *maximize button* (the button with an upward-pointing solid triangle) in the upper right-hand corner of a partial-screen window. A maximized window has a *restore button* (the button with both upward and downward-

⁷ The hourglass icon is the standard Windows symbol which indicates that some operation is underway; it means the user has to wait.

pointing solid triangles) in place of the maximize icon. Clicking on the restore button makes the window assume the shape and size it had prior to being maximized.

To *minimize* a window means to essentially clear it from the screen without completely closing it. A minimized window is represented by a small icon, usually at the bottom left of the computer screen. This can be done by clicking with the left mouse button on the *minimize button* (the button with a downward-pointing solid triangle), located in the upper right-hand corner of a maximized or partial-screen window. The window will disappear from the screen and be replaced by a small icon, which is generally located at the bottom of the screen but which can be dragged to another location if desired. To restore a minimized window to its original (full or partial-screen) shape and size before being minimized, *double-click* on the small icon representing it. (To *double-click* on an object means to point with the mouse cursor at the object and to click the left mouse button twice in rapid succession. If the two clicks are not made rapidly enough, in general nothing untoward will happen and the double-click can be tried again.)

3.3.2.5 Repositioning within a Window

Because of its size and shape, a particular window may not be able to show all the information that is actually available. For example, a window that shows tabular data may only be large enough to display a limited number of rows and columns from the full data table. In order to shift the information display so that different information is shown, a set of horizontal and vertical *scroll bars* is provided for most windows. These are located on the right and bottom edges of a window.

Scroll bars can be used in three ways. First, the small square *scroll boxes* aligned on the scroll bar can be dragged along the bar to a desired position. The scroll boxes' position with respect to the top and bottom (vertical bar) or the left and right (horizontal bar) ends of the scroll bars indicates the corresponding position of the information view with respect to the entire set of data. Second, by clicking on the *scroll arrows* at either end of the scroll bar the information view changes in the corresponding direction by one line vertically or a similarly small amount horizontally. The scroll box changes position by a corresponding amount. If the mouse button is held down on a scroll arrow, the information view shifts continuously. Finally, by clicking within a scroll bar on either side of the scroll box, the information view changes in the corresponding direction by a screen vertically or some similarly large amount horizontally. Again, the scroll box also changes position by a corresponding amount.

In some cases, if all information is displayed in a screen window and nothing additional would be seen by scrolling, the scroll arrows may be absent or grayed out (dimmed) to indicate that they cannot be used.

3.3.2.6 Closing a Window

To *close* a window means to clear it completely from the screen. The information that was in the window may or may not be easily accessible again, depending on the situation. Experience will teach when it is preferable to close or to minimize windows. In general, a

window should be closed when the user is sure that it will not be necessary to access the data again in the short-term; to simply clean up a cluttered screen, it may be advisable to minimize, rather than close, windows that are not immediately needed.

A window can be closed by double-clicking on its *control menu box*, the small box with a horizontal black bar located in the top left-hand corner of most windows. Single-clicking the control menu box displays a menu which includes Close as one of its items; this can also be used to close the window.

As a precaution, a Windows program such as MapInfo or the RMS may sometimes ask the user certain questions before closing a window. The subject and appropriate response to these questions depends on the situation. However, the fact that such questions are being asked does not necessarily mean that the window shouldn't be closed; it's usually just a way of checking that the user really does want to close the window.

3.4 MAPPERS

A *mapper* is a particular type of window provided by MapInfo to display map data.

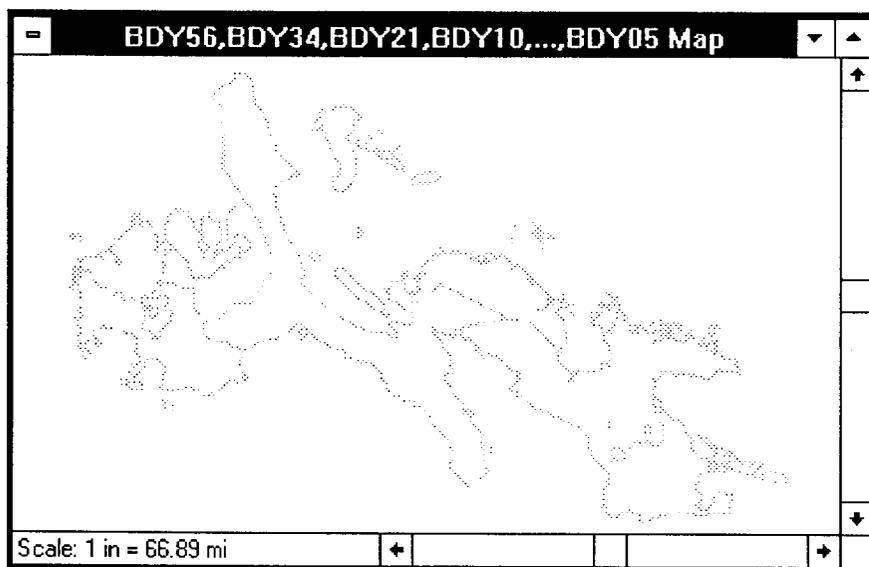


Figure 2

Any time that MapInfo is in use and something that looks like a map is on the screen, a mapper is involved. A mapper can be manipulated in all the standard ways discussed in section 3.3.2 (e.g., maximized, minimized, moved, etc.), but in addition can be manipulated in a number of ways which are specific to map-type data. These manipulations can be carried out by clicking on the information box at the bottom left of the mapper window, which gives access to the **Change View** dialog box.

The **Change View**⁸ dialog box shows the current zoom level, map scale and center window position. The *zoom level* of a mapper is the distance (in kilometers) from the left side to the right side of the displayed area; a high zoom level means that a wide geographic area is being displayed, but that fine details will probably not be clearly seen. The *map scale* has the conventional meaning, but in MapInfo is usually expressed in terms of kilometers per centimeter. Multiplying the displayed number by 100,000 will result in a conventional expression of the mapper scale. The *center window position* is the easting (X) and northing (Y) of the center of the mapper window, expressed in meters with respect to Zone 51 of the UTM projection. If mouse cursor is moved into any of the three boxes displaying this information, the cursor takes on a characteristic I-beam shape. By clicking, the selected box becomes active and new values can be typed in from the keyboard. The keyboard's Backspace key can be used to erase characters to the left of the I-beam cursor and the Delete (or Del) key can be used to erase characters to the right of the cursor. Typing a new value in one box may also change the value displayed in other boxes.

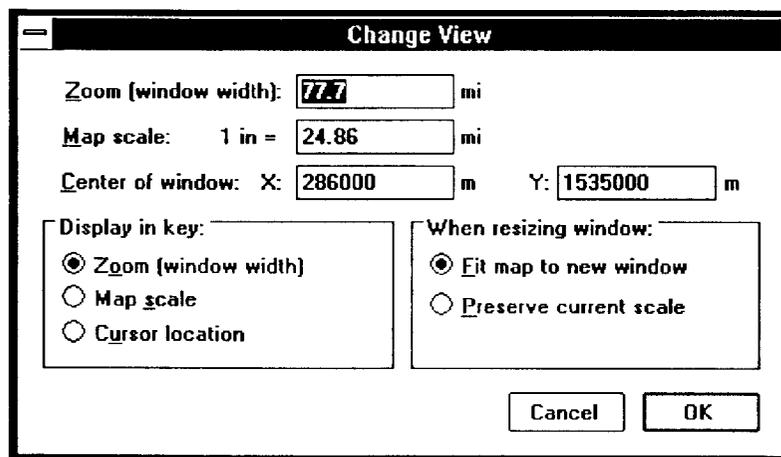


Figure 3

Certain map display options can also be set through the **Change View** dialog box. By clicking on one of the buttons located in the *Display in key* area of the dialog box, the user can choose to have the zoom level, the map scale, or the cursor coordinates (UTM Zone 51 easting and northing) displayed in the mapper's bottom left annotation area.

Through the *When resizing window* dialog box options, the user can also select how map redisplay is to be handled when a mapper is resized. The default behavior is to fit the original map to the new window: the zoom level remains the same but the map scale changes. Alternatively, the user can choose to keep the original scale and to allow the size of the new mapper window to determine how much map is shown (by changing the zoom level).

⁸ **Boldface text** will be used to refer to dialog boxes as a unit, while *italic text* will be used to refer to specific components of a dialog box.

The **Change View** dialog box is exited by clicking on the *OK* button if the user wants to accept the new mapper values; or by clicking on the *Cancel* button if the old mapper values are to be maintained. After either button has been clicked, the **Change View** dialog box goes away and the mapper window is redisplayed with the appropriate values.

The **Change View** dialog box is also accessible through the RMS **Map** menu discussed in Chapter 8 below. The **Map** menu also allows other types of mapper manipulations to be carried out. These are also discussed in Chapter 8.

3.5 BROWSERS

A *browser* is a particular type of window provided by MapInfo to display tabular data. Any time MapInfo is in use and something that looks like a spreadsheet (a array of rows and columns of data) is on the screen, a browser is involved. A browser can be manipulated in all the standard ways discussed in section 3.3.2 (e.g., maximized, minimized, moved, etc.), but in addition can be manipulated in a number of ways which are specific to tabular data.

The rows in a browser window correspond to particular objects (records) in a database while the columns correspond to attributes of the objects (fields). The titles (field names) of the columns appear at the top of the columns beneath the browser title bar. Annotation at the bottom left of the browser indicates how many records are in the browser and which of those records are currently in view in the window.

SEG27 Browser			
Province	Road	KPO	KPE
27	N388	438.337	439.036
27	N388	439.036	441.699
27	N388	441.699	442.227
27	N388	442.227	446.526
27	N388	446.526	447.013
27	N388	447.013	448.656
27	N388	448.656	450.086
27	N388	450.086	452.765
27	N388	452.765	456.240
27	N388	456.240	465.330
27	N588	290.490	292.796
27	N588	292.796	293.409
27	N588	293.409	304.202
27	N588	304.202	306.294
records 127 - 140 of 147			

Figure 4

It is possible to rearrange the order in which the browser columns are displayed. However, this is only a temporary change which does not affect the underlying organization of the data. To do this, move the mouse cursor over the heading (field name) of a column to be repositioned. The mouse cursor will change into the shape of a hand. Drag the column heading to the desired location, and release the mouse button when the column appears in the desired position. (The data in the browser window will appear grayed out while the column order is being rearranged.)

It is also possible to change the width of a column in the browser. To do this, move the mouse cursor to the vertical line to the right of the heading (field name) of the column to be resized. The mouse cursor will change into a four-way arrow. Drag the vertical line left or right until the column has the desired width, then release the mouse button. Again, this is a temporary change in the browser's appearance which does not affect the underlying organization of the data.

Additional operations on certain RMS browsers are provided in the RMS Tables menu, described in Chapter 7 below.

3.6 LAYOUTS

A layout is a window which is used for formatting maps or tables for output to a printer or plotter. It is never obligatory to use a layout in order to print or plot something. However, layouts offer a number of convenient tools for arranging and customizing maps, tables and annotations on an output page and so are often used for preparing production-quality output.

Layouts contain isolated text or graphic objects, as well as frames. A *frame* is a rectangular portion of a layout which has been designated to contain the image of a mapper or browser also on the screen. MapInfo can automatically create a frame or frames when a layout window is opened; the user can also define or modify frames. A layout can have any number of frames of arbitrary length, width and position.

Most layout manipulations are accessed through the RMS Layout menu, which contains a number of menu items for carrying out particular tasks. The RMS Layout menu, which is briefly described in Chapter 9 below, is identical to the MapInfo Layout menu described in the MapInfo Reference and User's Guide. Full details on the use of these commands can be obtained from these sources, and in fact proficiency with layouts only comes after a considerable amount of experimentation and experience.

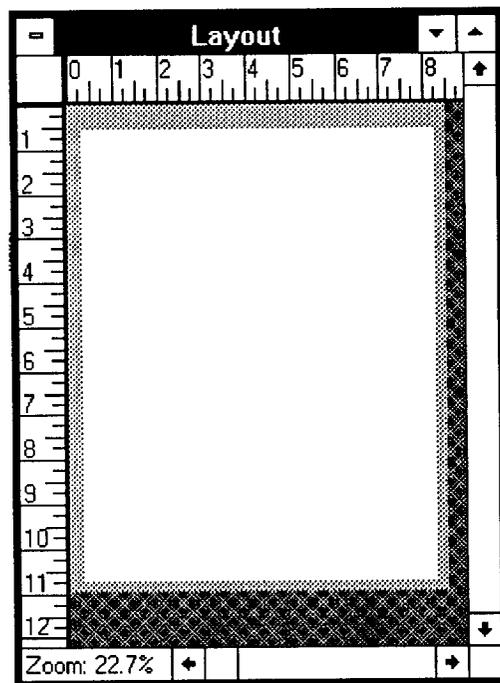


Figure 5

The layout window itself allows some control by clicking on the information box in the lower left-hand corner. This action opens the **Layout Display Options** dialog box. With this dialog box, the user can choose to have the layout contents displayed always, never, or only when the layout window is active. The layout normally contains horizontal and vertical rulers (graduated in centimeters) that allow the true (printed or plotted) size of objects to be judged; these can be turned off or on by clicking on the *Show Rulers* check box. Normally too the layout draws dotted lines to show when requested output exceeds the size of a page

(as specified in the **RMS Print Setup** menu item of the **File** menu); this feature can also be turned off or on by clicking on the *Show Page Breaks* check box. In fact, however, there is normally little reason to change the default settings for these options.

The final control in the **Layout Display Options** dialog box specifies the *zoom level* of the layout. Unlike the mapper zoom level discussed in section 3.3.3 above, a layout's zoom level refers to the ratio of screen image size to true size and is expressed as a percentage. A layout zoom level less than 100% means that the screen image of the layout is smaller than it will actually appear on the output, while a zoom level greater than 100%⁹ means that the screen image of the layout is larger than it will actually appear on output. This parameter can be directly specified by moving the mouse cursor into the *Zoom* box and clicking when it becomes an I-beam cursor. The desired zoom level can then be directly typed in.

Any changes specified in the **Layout Display Options** dialog box can be ignored by clicking on the box's *Cancel* button; they are made effective by clicking on its *OK* button. In either case, the dialog box is removed from the screen and the layout (which was partially covered up by the dialog box) is redrawn.

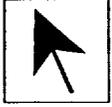
3.7 THE MAPINFO TOOL PALETTE



The MapInfo tool palette is a rectangular array of icons which appears on the MapInfo screen. (In fact the palette is a special type of window; while it cannot be closed or resized by an end user, it can be dragged to a different position on the screen if desired.) Each icon in the palette represents a particular kind of "tool". By clicking on a particular tool, the mouse and/or keyboard can be used to carry out a specific processing task; often the shape of the cursor itself also changes, after a tool has been selected, to indicate the task which it can be used to perform. At any given time, certain tools may be active (selectable) or inactive; for example, tools used with mappers would not normally be selectable when the active window is a browser. The set of active and inactive tools changes automatically with changes in the MapInfo context. Inactive tools are dimmed (grayed).

Each tool in the palette has a name. The following list furnishes a brief description of each tool (in left to right, top to bottom order of their appearance in the tool palette); each is thoroughly documented in the MapInfo Reference and User's Guide, which should be consulted for further details on the purpose and use of these tools.

⁹ As will be seen in Chapter 9, percentage zoom values appearing in layout windows should be considered as approximate.



Select Tool: used to designate one or more objects (mapper or layout) or records (browser) for further analysis or editing; double clicking on an object with Select Tool displays a dialog box allowing access to some of the internal MapInfo object parameters;



Grabber Tool: dragging a mapper with the Grabber Tool changes the view shown in the mapper without changing the scale or zoom level; only the location of the center point changes;



Radius Search Tool: used to automatically select all objects in a mapper that are within a circle drawn with the tool;



Polygon Search Tool: similar to the Radius Search Tool, but used to automatically select all objects in a mapper that are located within the boundaries of a polygon drawn with the tool;



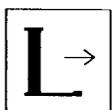
Zoom In Tool: dragging on a mapper with the Zoom In Tool draws a rectangle on the screen; when the left mouse button is released, the area within the rectangle expands to fill the entire mapper window (which itself does not change size); this provides a more detailed view of a smaller area than was shown in the original window;



Zoom Out Tool: dragging on a mapper with the Zoom Out Tool draws a rectangle on the screen; when the left mouse button is released, the entire area shown in the mapper is shrunk to occupy the rectangle; the remainder of the mapper window (which does not change size) is drawn with data which could not previously be shown because of the scale; this operation provides a less detailed view of a larger area than was shown in the original window;



Info Tool: clicking on a mapper object with the Info Tool opens a small Info window which displays in tabular format any data associated with the object. For example, clicking with the Info Tool on the symbol of a population center will open a window showing the population center's name, NSO code and type (as discussed in Section 2.1); clicking on a segment of identified road will display the province code, road identifier, and beginning and ending stationings of the segment. If several objects are on top of each other on the screen, clicking successively with the Info Tool while holding down the CTRL key will display information windows for each of the objects in turn;

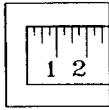


Label Tool: clicking on an object with the Label Tool will cause some information about the object to be written on the screen (this text is called a label). The **Layer Control** menu item in the **Map** menu allows the user

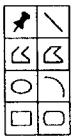
to select the information that will be written. Labels can be repositioned by using the Select Tool to drag them to a new location on the screen. Labels appear on plots and layouts, but are not permanent: they are not preserved from one MapInfo/RMS session to the next;



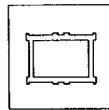
Text Tool: clicking on a mapper location with the text tool allows the user to type in text annotations starting at that location; like labels, text annotations are not preserved between RMS sessions but do appear on plots or layouts;



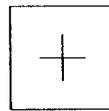
Ruler Tool: the Ruler Tool is used to measure straight-line distances between points in a mapper. To use the Ruler Tool, click on the starting point, then the next point and so on. Dotted lines between the selected points are temporarily drawn on the map. A small window displays the total cumulative distance from the starting point through to the last selected point, as well as the partial distance from the last point to the current cursor position. Distance measurement is terminated by double-clicking;



Point, Line, Polyline, Region, Ellipse, Arc, Rectangle and Rounded Rectangle Tools: these are used to draw the corresponding types of objects on a mapper or layout window;



Frame Tool: the Frame Tool is used to define frames within a layout window;



MapBasic Tool: this tool would not normally be used by RMS end users.

Some of the tools in the Tool Palette are unlikely to be of much use in the RMS. Probably the Select, Grabber, Zoom In, Zoom Out, Info, Label, Text, Ruler and Frame Tools will prove the most useful to RMS end users. Again, the MapInfo documentation should be consulted for full details on the capabilities and utilization of these tools.

The remaining chapters of this manual explain the various RMS menus. Each chapter treats one of the system's menus, with individual sections on the various menu items it contains. There will be little discussion of more general MapInfo capabilities except as specifically required for the presentation of the RMS.

CHAPTER 4

THE FILE MENU

4.1 INTRODUCTION

The **File Menu** contains the functions that the user needs in the preparation of Base maps for analysis and presentation.

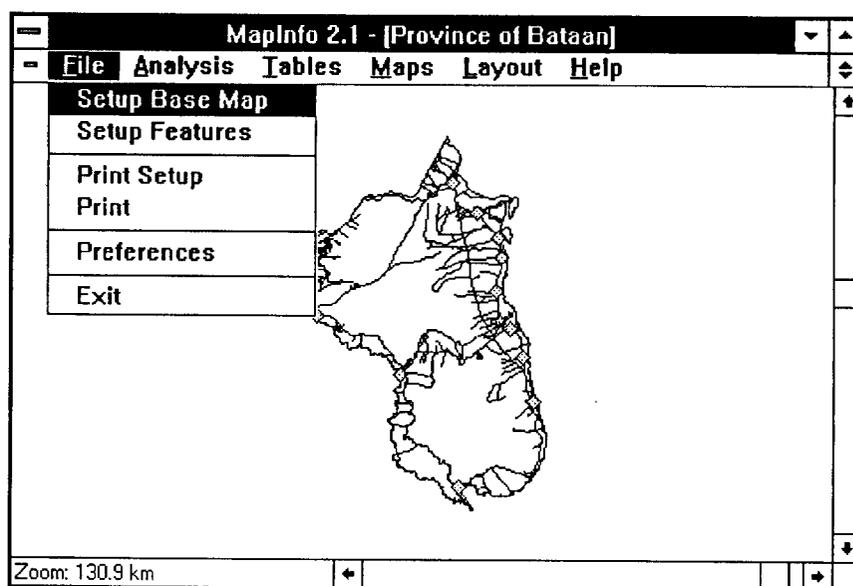


Figure 6

- menu item **Setup Base Map** creates the base map that will serve for data display and analysis.
- menu item **Setup Features** which is used to select and prepare the road feature data of interest.
- menu item **Print Setup** which is used to select the output device that will be used by RMS
- menu item **Print** prints a copy of active window
- menu item **Preferences** which allows the user to specify the location of files
- menu item **Exit** shuts down the RMS and MapInfo

4.2 SETUP BASE MAP

When using the RMS, the first operation that must be performed by the user is the preparation of the base map. Preparation of a base map involves:

- specification of the province or provinces of interest;
- specification of the roads of interest by indicating the administrative classification (national, provincial, barangay, other) of the roads to be displayed and analyzed; and
- specification of the population centers of interest by indicating the administrative levels (provincial capitals; chartered cities; municipalities; barangays) to be displayed.

The purpose of this setup operation is not just to prepare and display a map on the computer screen, but also to set up internal tables which allow the RMS to carry out other processing work which might be requested. Thus, even if the user does not require the actual preparation of a base map, the various steps of the **Setup Base Map** menu item must be carried out. The mapper window which is displayed at the conclusion of these setup steps, and which shows the base map resulting from the specifications, can always be closed if desired.

Clicking the menu item **Setup Base Map** a dialog box is displayed.

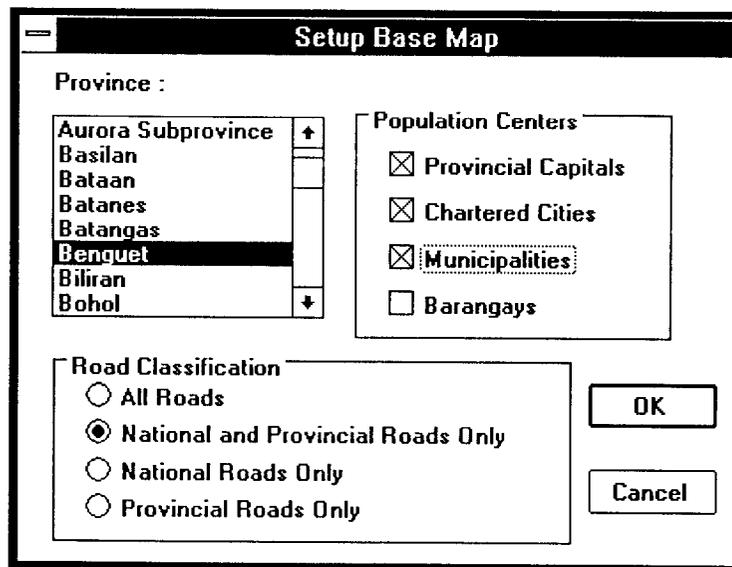


Figure 7

The Dialog box of the Setup Base Map menu item correspond closely to the three required operations listed below:

- PROVINCES menu allows the specification of the province or provinces of interest;

- ROAD CLASSIFICATION menu is used to designate the road administrative classifications of interest;
- POPULATION CENTERS menu permits the selection of the administrative levels of the population centers to be displayed.

4.2.1 Selecting Provinces

A scrollable list box of alphabetically-ordered province names is provided by the system. To select a particular (single) province, it suffices to click on it. The province name will change color within the list box to indicate that the selection has been made. The list box includes a vertical scroll bar which can be used to reposition the list if needed.

Any number of provinces may in fact be selected. To select several provinces, the keyboard CTRL key should be held down while clicking on the desired provinces. Each selected province name will change color. To unselect one particular province in a set, click on it a second time (while keeping the CTRL key held down); that province will be removed from the set but other provinces in the set will not be affected. If a province is clicked on when the CTRL key is not held down, the entire selected set will be unselected and will have to be selected again if desired.

4.2.2 Selecting Road Classification

This choices will allow the user to specify which road classes are of interest for a particular RMS session. The following choices will be available through a set of option buttons:

- all roads(i.e,rural , national, provincial and barangay roads);
- national and provincial roads only;
- national roads only;
- provincial roads only.

Only one option button can be selected at any given time. The default choice is to display all roads, but clicking on any of the option buttons will cause the corresponding choice to be selected.

4.2.3 Selecting Population Centers

Through the check box menu, the user has the ability to specify which population center are to be displayed on the base map by checking the box on or off through clicking. The possibilities are as follows:

- provincial capitals;
- chartered cities;

- municipalities;
- barangay

Each administrative level has a standard symbol which is displayed on the base map at the location of the government or administrative seat. The Population Centers Check box menu determines which of the symbols will actually appear on the base map and be included in the RMS internal tables.

If several provinces were chosen via the Provinces Multi List Box, the population center display option applies to all of the provinces. It is not currently possible in the RMS, for example, to display all administrative levels in one province and only the capital and cities in others. (This behavior will also apply to the selection of road classifications.)

Once the user has completed the selection of provinces, road classes and administrative levels as described above, the OK button should be chosen. This causes the RMS to prepare the selected information, to set up a number of internal tables which are needed for further RMS processing, and to display the selected information in a full-screen mapper. (If only a portion of the selected province(s) is shown in the mapper, the Map|**Change View** menu item or the Zoom Out tool from the Tool Palette can be used to view a larger area.)

If the selection for a province has been completed, it is possible to select a different province. A warning will be issued, click CONTINUE to go ahead or CANCEL to nullify the selection. It is also possible to choose a different road classification or administrative level/s after a selection has been completed, this is done by selecting a different road class or population center/s and omitting any province selection.

The selection may be cancelled by clicking the CANCEL button; in this situation a reminder that the province selection must be carried out is issued. In either case, control is returned to the File main menu.

The user must take note that the display of province boundaries and other information in a mapper is not actually carried out until the *OK* button is executed.

The Title bar of the mapper window will indicate the name of the province if the provinces selected is less than three and the text "Provincial Maps " if it is more than three.

There are four layers(MapInfo Tables) being used by the system.

- SegTab is a table with data on the road segments belonging to roads with the selected administrative classes in the selected provinces;
- PopTab is a table containing information about the selected administrative levels of population centers in the selected provinces;
- BdyTab is a table which stores data about the provincial boundaries of the selected provinces.
- RoadTab is a table which stores data about the identified roads together with

the beginning and ending stations..

It is useful to know what these tables represent because the **Map|Layer Control** menu item, among others, refers to the tables by name when the user specifies certain map display options such as label variables and fonts.

At this point it is possible to examine the base map on the screen or to plot it out using the **Print Setup** and **Print** menu items. However, if it is desired to view and analyze road feature data, the **Setup Features** menu, described in the next section, must be executed.

4.3 SETUP FEATURES

The **Setup Features** menu item allow the users to:

- examine what feature data is available in the RMS and what attributes are stored for each feature (see section 2.2 above);
- select two or more features and merge them into a single synthetic feature (see Section 2.3 above); and
- select a feature and dynamically segment the road network based on its homogeneous sections (see section 2.4 above).

It is only necessary to utilize the **Setup Features** menu item and its processing options if road feature data is to be analyzed and mapped. If base map preparation and output is all that is required, the **Setup Base Map**, **Print**, **Print Setup** menu items and **Layout** (optional) menu can be used without using the **Setup Features** and other menus. However, thematic mapping or road feature data analysis require dynamic segmentation be carried out in order to prepare the base map and data. Figure 8 displays the Setup Features Dialog box.

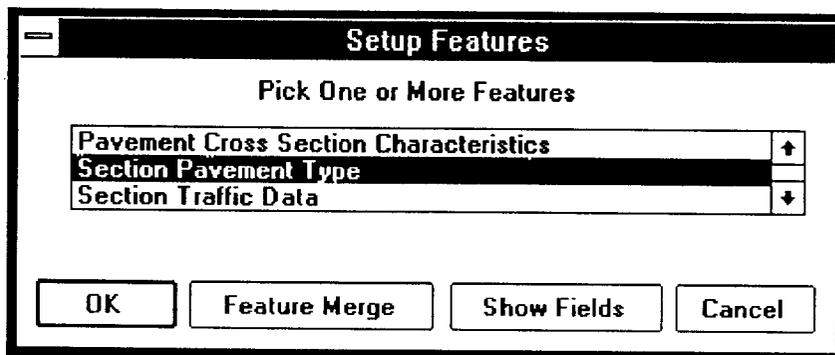


Figure 8

Feature merging may or may not be required in a given RMS session, depending on whether or not several separate features are of interest. (The only way to simultaneously access data

from two or more features is to perform a feature merge.) After feature merging has been done, the resulting output feature can only be mapped or analyzed after a dynamic segmentation based on the output feature has been done.

The **Setup Features** menu item is used to select either a single feature for dynamic segmentation or else two or more features for feature merging. Clicking on the menu item displays a dialog box with a scrollable list of available features (feature attributes are not shown, however) together with an *OK*, *Feature Merge*, *Show Fields* and *Cancel* button. The scrollable list box contains descriptions of each available feature, including any temporary synthetic features which may have been created as a result of feature merging.

To select a single feature (for dynamic segmentation), click on it. The feature description in the scrollable list box will change color to show that it has been selected. Then click on the *OK* button to complete the selection and close the dialog box. If the wrong feature is clicked on (before clicking on the *OK* button), it suffices to click on the correct one to shift the selection from one to the other; then the *OK* button can be clicked. Clicking on *Cancel* nullifies any selection which might have been made and closes the dialog box. This is not an error, but some feature will have to be selected before proceeding with further work.

To select two or more features (for feature merging), hold down the **CTRL** keyboard key while clicking on the desired features with the mouse. Each of the clicked on features will change color to indicate that it has been selected. While the **CTRL** key is still being held down, a selected feature can be unselected by clicking on it a second time. (Note that the technique of multiple selection described here is the same as that described in section 4.2 under the explanation of the selection of several provinces for processing.) When all desired features have been selected, click on the *Feature Merge* button. to indicate that the selection process is complete. As before, clicking on the *Cancel* button does not result in an error, but the **Setup Features** menu item will have to be executed again before thematic mapping or further analysis can be done.

4.3.1 Feature Merge

Clicking on the *Feature Merge* button displays a dialog box which contains a text box requesting the user to provide a description for the output synthetic feature file, together with *OK* and *Cancel* buttons.

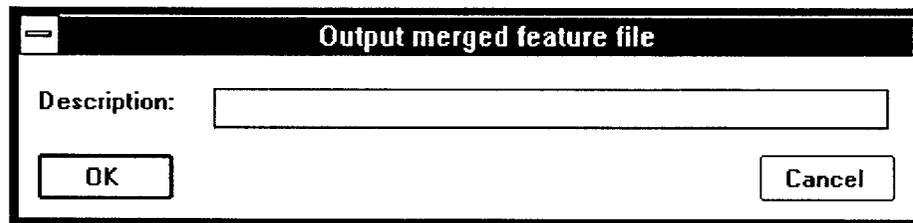


Figure 9

The user simply clicks in the text box, then types in a suitable description of the output synthetic feature file to be created. Clicking on the *OK* button will confirm the input and

close the dialog box; clicking on the *Cancel* button will nullify the input and cause the display of an information message.

After the *OK* button is clicked, the screen will flash and redraw, signifying that the feature merging has been performed. Before thematic mapping or analysis tasks can be performed, the user will have to explicitly select the feature of interest for the task: the synthetic feature resulting from the feature is not automatically selected. After the feature merging is complete, a message is displayed to remind the user to select a single feature before proceeding.

The text description provided by the user will appear in all the feature selection list boxes preceded by a "(T)" to indicate that the feature is temporary and will be erased at the end of the RMS session.

4.3.2 Show Fields

The *Show Fields* button displays a list with description of the road features available in the RMS and an *OK* and *Cancel* button. Figure 10 below displays the typical dialog box when the user click on the *Show Fields* button.

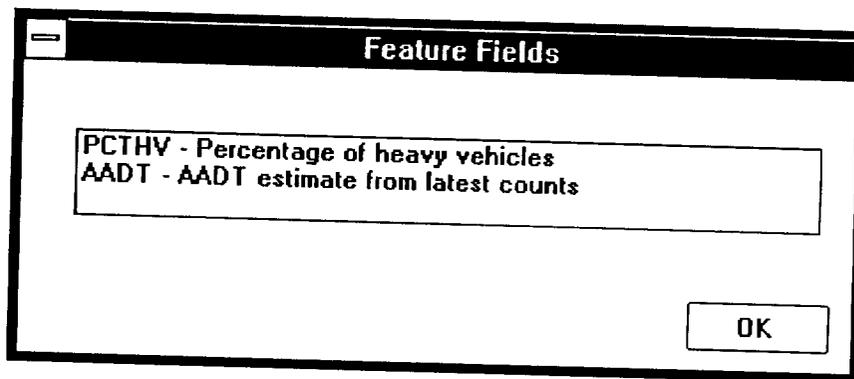


Figure 10

4.3.3 Dynamic Segmentation

Processing the data (that is by clicking the *OK* button from the **Setup Features** menu item) initiates dynamic segmentation based on the homogeneous sections of a selected feature. One and only one feature must have been selected, prior to selecting the *OK* button.

No user interaction is required during this process. Because dynamic segmentation is a computation-intensive task, it may take a few minutes for the procedure to be carried out; the actual time depends on the number of homogeneous sections in the feature data for the selected roads. An hourglass icon is displayed over the base map while the dynamic segmentation is taking place. If the currently-selected feature has already been used in dynamic segmentation during the RMS session, the earlier results are automatically re-used;

in other words, the RMS will not re-segment the network.

When the dynamic segmentation procedure is finished, the hourglass icon is replaced by a normal mouse cursor, and the mapper title bar indicates a new overlay (layer) called Attributes in addition to the usual layers SegTab, PopTab and BdyTab. The Attributes layer looks the same as the SegTab layer (the two overlap perfectly). However, road segments in the Attribute layer correspond to the feature data homogeneous sections. They follow the alignment of the road, but begin and end at the beginning and ending stationings of homogeneous sections (rather than at intersections and other similar locations, as they do in SegTab). Furthermore, the feature data corresponding to each homogeneous section on the Attribute layer is accessible from the mapper; clicking on an object in the Attribute layer with the Info Tool (in the MapInfo tool palette) will open an Information window which displays not only the usual province code, road identifier, and beginning and ending stationings (of the homogeneous section), but also the feature data for the section.

As stated earlier, the *OK* button must be executed after selecting a feature to carry out dynamic segmentation of the selected feature data in order for thematic mapping or other analysis tasks to be carried out.

4.4 PRINT SETUP

The **Print Setup** menu item is used to select the output device that will be used as a basis for preparing a layout, or for outputting RMS map or tabular data.

It displays a scrollable list of available output devices. Clicking on a member of the list selects that device as the current output device, and clicking on the *Setup...* button gives access to additional parameters which can be used to configure the output device. The exact set of accessible parameters depends closely on the selected device; typically, the *Setup...* button allows specification of such things as paper size, manual or automatic sheet feed, color choices (for color output devices), etc.

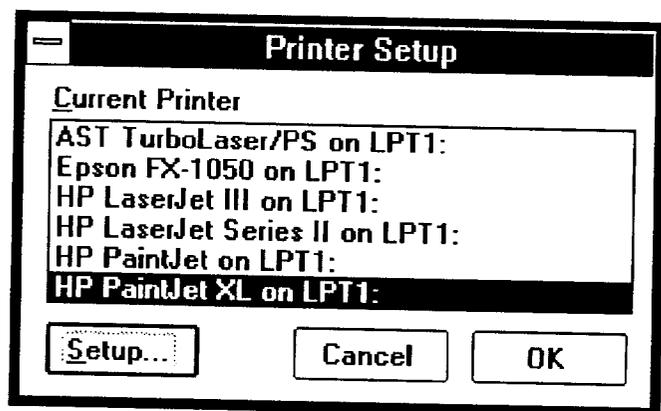


Figure 11

After setting up the selected device with the parameters appropriate for the desired output, clicking on the *OK* button confirms the choice and establishes the parameters for the device; it is not necessary to reselect these parameters the next time the device is chosen, although they can be explicitly changed if desired.

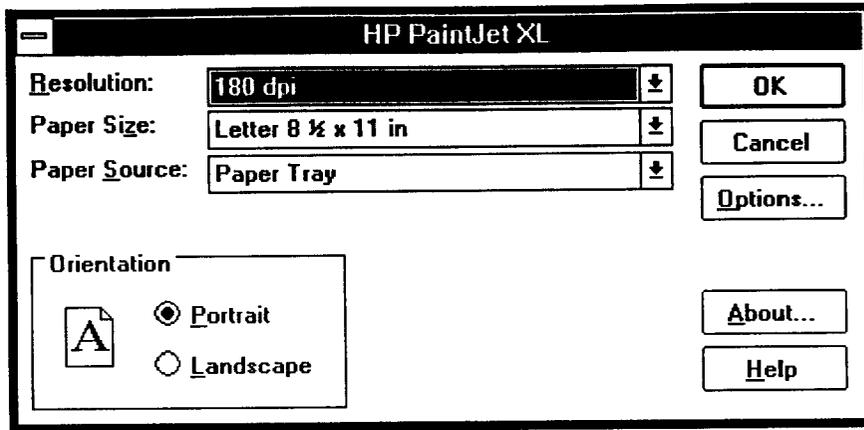


Figure 12

The Windows Setup application can be used to install additional devices for use by Windows and the Control Panel application can be used to perform a more detailed system setup for output devices. This will ordinarily have been done (or verified) when the RMS was installed, and will only have to be modified if new hardware or upgraded software drivers are installed.

Note that although Windows and MapInfo refer to printers in a generic sense, the menu options apply equally well to printers and to plotters. Usually the setup menus will clarify whether a given device is considered a plotter or a printer.

4.5 PRINT

Clicking on the **Print** menu item prints a copy of the active window to the current output device and with the current configuration options. Figure 13 display a standard dialog box for printing.

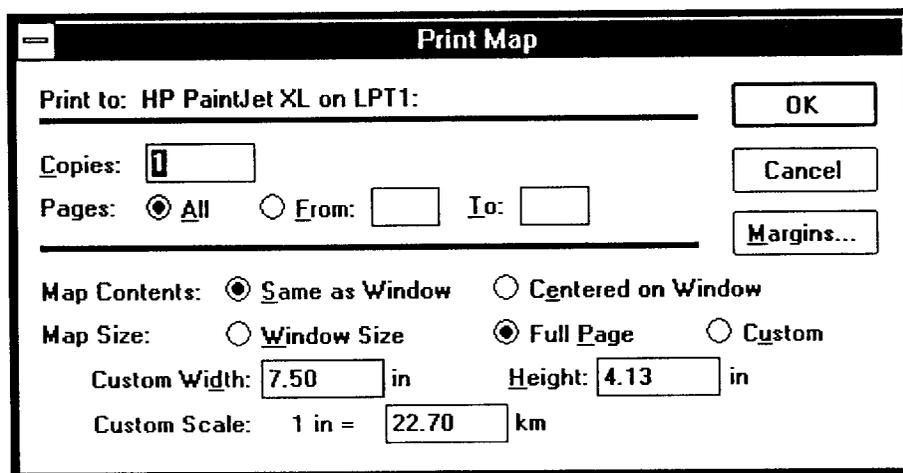


Figure 13

The title of the dialog box which is opened confirms the type of window being output (mapper, browser, layout, etc.); the dialog box itself allows specifications of last-minute options such as the number of copies to output and the page margins to use.

4.6 PREFERENCES

When you choose **Preferences** from the File Menu , the Preferences Dialog Box appears. RMS then lets you set or change directories for the location of files that being used by the system(see Figure 14)

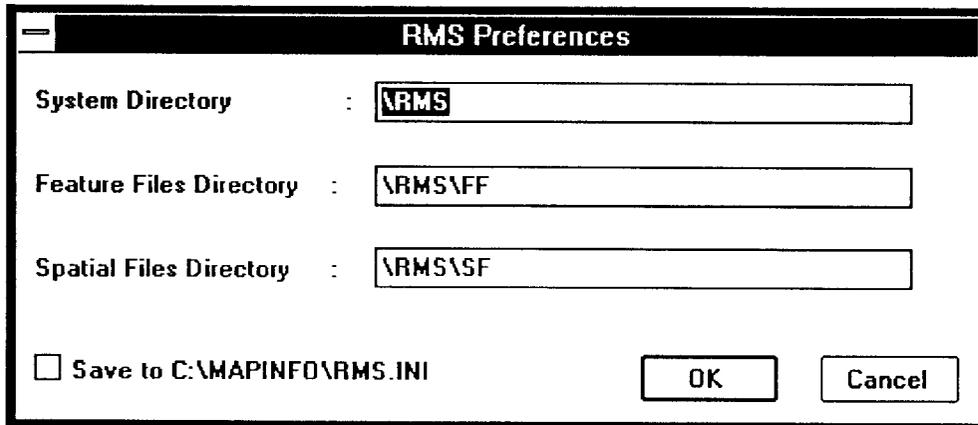


Figure 14

The files that being used by RMS are grouped into three directories.

- The SYSTEM DIRECTORY which contains the RMS program files;
- The FEATURE FILE DIRECTORY which contains the Data Dictionary and Road Feature Data Files;
- The SPATIAL FILE DIRECTORY which contains the Province Boundaries, Population Centers and Road Files

The changes or setting that the user made can be save permanently using the *Check Box* control; the user checks the box on or off by clicking. If the *Check Box* is on, RMS will save the setting on file RMS.INI located in the mapinfo directory. The system will create the RMS.INI file if no such file exists.

Clicking the *OK* button will make the setting in effect while the *Cancel* button will the cause the previous setting to remain in effect.

The user can modify the RMS.INI in two ways

- using an editor outside RMS
- using menu item PREFERENCES in RMS

Since that RMS.INI is the first file needed by the system, menu item **PREFERENCES** will be invoked automatically once you run RMS without the RMS.INI. This process is being used in order that the user may be able to indicate the location of file that RMS will be using.

4.7 EXIT

The **Exit** menu item shuts down both the RMS and MapInfo, leaving the user in the Windows environment. When the RMS is shut down, temporary files are erased and permanent files are closed.

CHAPTER 5

THE ANALYSIS MENU

All of the work in selecting and setting up data for mapping and analysis is carried out with the **Setup Base Map** and **Setup Features** menu items. Once any required feature merging has been performed, and the selected road network has been dynamically segmented in accordance with the selected feature's homogeneous sections, then analysis, mapping and data output can begin. The remaining menus provide capabilities required for these tasks.

5.1 INTRODUCTION

The **Analysis** menu includes a number of menu items useful for examining and transforming available RMS data, and for locating and identifying roads and population centers in the selected provinces.

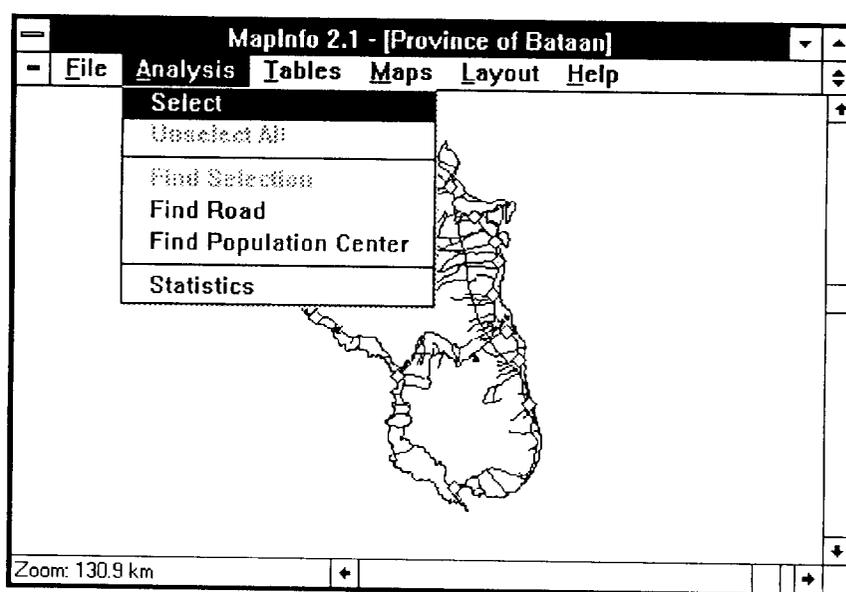


Figure 15

The menu items it provides are as follows:

- menu item **Select**, which is a direct pass-through to the original MapInfo **SQL Select** menu item;
- menu item **Unselect All**, which enables any selected map objects or table records to be easily unselected;
- menu item **Find Selection**, which positions a mapper to display an object selected in a corresponding browser, and vice versa;

- menu item **Find Road**, which displays a list of currently available roads (i.e., those that were selected through the province and road classification selection menu items); the user can click on one of the displayed roads and it will be highlighted on the mapper;
- menu item **Find Population Center**, which displays a list of currently available population centers (i.e., those that were selected through the province and population center selection menu items); the user can click on one of the displayed population centers and it will be highlighted on the mapper;
- menu item **Statistics**, which calculates and displays summary statistics about selected items.

5.2 SELECT

The MapInfo **SQL Select** menu item is a very powerful data selection and analysis command. It implements major portions of the standard SQL (Structured Query Language) database language.

Figure 16

MapInfo's SQL capabilities are discussed at length in Chapter 8 of the MapInfo [Use's Guide](#) and under the **SQL Select** command writeup as well as in Appendix 5 in the [Mapinfo Reference](#). The **SQL Select** menu item provided in the RMS is identical to the version provided by MapInfo. The RMS user should refer to the MapInfo documentation for further information on this powerful data analysis command.

5.3 UNSELECT ALL

Clicking on the **Unselect All** menu item is a rapid way of unselecting any objects or records that may be selected; it doesn't matter whether they are visible on the screen or not. This menu item is a direct pass-through to the corresponding MapInfo menu item; MapInfo

documentation may be consulted for additional details.

5.4 FIND SELECTION

The **Find Selection** menu item is another direct pass-through to the MapInfo menu item of the same name. This menu item is useful when a mapper and a browser of the same data are both present on the screen.

If the mapper is active and a mapper object is selected, clicking on the **Find Selection** menu item will display the corresponding record in the browser; the record will be highlighted, of course, because it corresponds to a selected object. The range of records displayed in the browser will be shifted, if required, to bring the selected record into view. If the browser is active and a record is selected, clicking on the **Find Selection** menu item will display the corresponding object in the mapper; the object will be highlighted, of course, because it corresponds to a selected record. The mapper's center position will be shifted, if needed, to bring the object into view, but its zoom level and scale will not be modified. It may sometimes be necessary to change these manually (by clicking on the bottom left information box of the mapper window or using the **Map|Change View** menu item) to get a better idea of the location of the object being displayed.

5.5 FIND ROAD

The **Find Road** menu item is used to highlight a road on the map, given its road identifier. Clicking on the menu item presents a dialog box in which the set of available roads (chosen in terms of the selected provinces and administrative classification and displayed in terms of their province code and road identifier) is shown in a scrollable list box. Clicking on one of the roads in the list box, then on the dialog box **OK** button, highlights the corresponding road in the mapper on the screen.

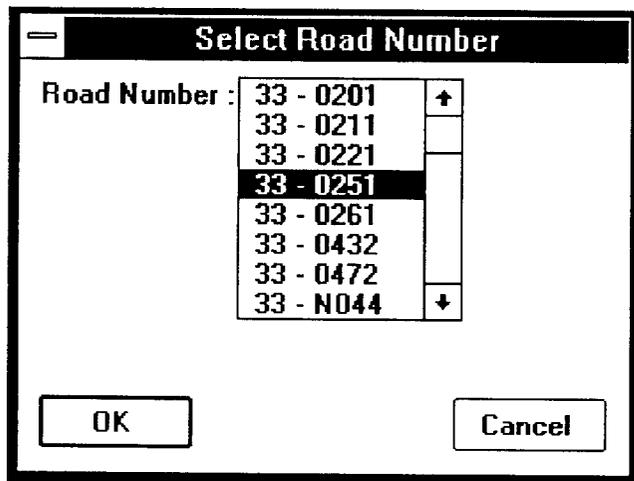


Figure 17

5.6 FIND POPULATION CENTER

The **Find Population Center** menu item is similar to the **Find Road** menu item except that the available population centers (specified in terms of the selected provinces and population center administrative levels) is shown. Clicking on one of the population centers displayed by name on the screen highlights the corresponding center in the mapper on the screen.

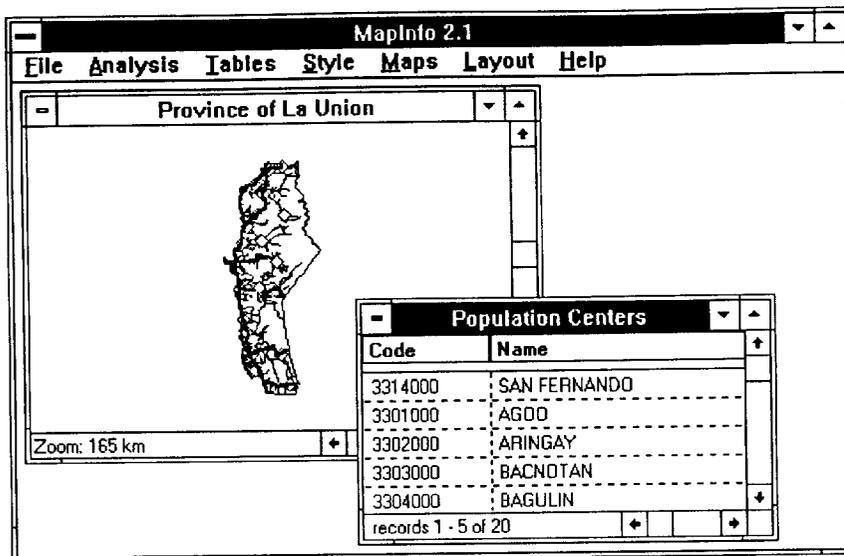


Figure 18

The displayed list of population centers is actually a browser; when there is no further need to make use of the Find Population Center option, the browser should be closed using normal Windows techniques (see section 3.3.2.6).

5.7 STATISTICS

The **Statistics** menu item is a direct pass-through to the MapInfo menu item of the same name. Clicking on the menu item displays a window showing the sum and average of all numeric fields for all currently selected objects.

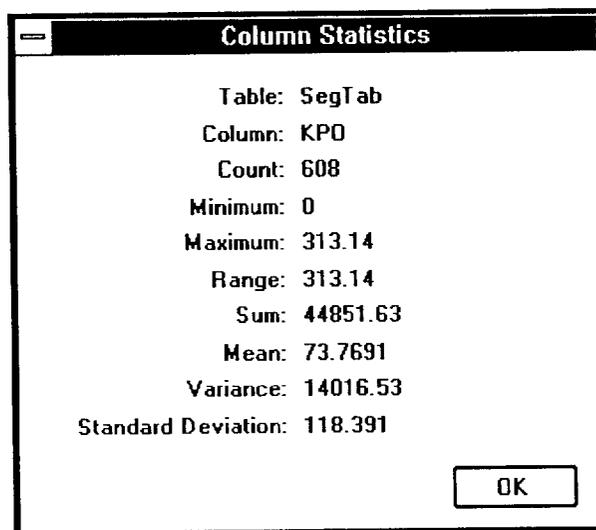


Figure 19

Selecting other objects will cause the sum and average to be immediately updated as long as the window is open.

CHAPTER 6

THE TABLES MENU

6.1 INTRODUCTION

The Tables menu gives access to a limited number of MapInfo browser commands for working with the Attributes table created by dynamic segmentation (see Chapter 5 above).

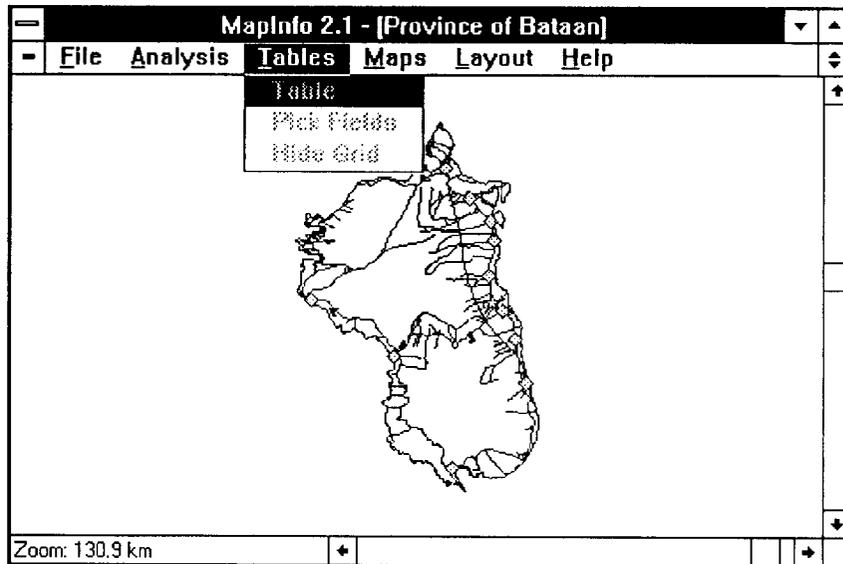


Figure 20

It contains three menu items:

- menu item **Table** opens a browser for the Attributes table;
- menu item **Pick Fields** enables a subset of the Attribute table fields to be displayed in the browser if desired;
- menu item **Grid** turns the browser's row and column grid lines off and on.

6.2 TABLE

Following creation of the Attributes table by dynamic segmentation, clicking on the **Tables|Table** menu item will open a partial-screen browser for the Attributes table. (The mapper will also be reduced to partial-screen size.). Figure 21 will show you a typical Attributes Table

Pavement Cross Section Characteristics Table				
Province	Road	Kpo	Kpe	Width
33	0201	265.692	265.852	6.1
33	0201	265.867	268.086	6.1
33	0211	284.244	286.427	7.0
33	0211	286.448	289.271	7.0
33	0211	289.373	290.261	6.0
33	0211	290.279	294.130	7.9
33	0211	294.130	297.112	6.1
33	0211	297.187	298.314	7.5
33	0211	298.314	303.552	6.7
33	0211	303.552	304.426	6.0
33	0211	304.426	304.489	6.0
33	0211	304.489	306.352	6.0
33	0211	306.367	308.899	6.0
33	0221	304.489	304.972	6.0
records 1 - 14 of 66		*		*

Figure 21

Operations on browsers are discussed in section 3.5 above.

6.3 PICK FIELDS

The **Pick Fields** menu item is a direct pass-through to the MapInfo menu item of the same name. It enables the browser to be customized by allowing users to remove unnecessary columns from the Attributes table. (Columns which are accidentally removed from the browser can also be re-added.)

The command displays a dialog box with two groups of column names: those in the Attributes table and those currently in the browser. Initially, all columns in the Attributes table are also in the browser. Clicking on a column name in the Attributes group, then clicking on the >>Add>> button adds the column to the browser. Conversely, clicking on a column name in the browser group and clicking on the *Remove* button eliminates the corresponding column from the browser.

Click on the *OK* button to confirm the changes to the browser, or click on *Cancel* to revert to the browser's original format.

As discussed in section 3.5, it is also possible to directly change the column width and order using the mouse cursor. Neither these changes, nor those made through the **Pick Fields** menu, affect the underlying Attribute table data in any way. They only change the way in which this data is displayed in the browser.

6.4 HIDE GRID/SHOW GRID

This menu item hides the rectangular grid lines delineating the browser's rows and columns if they are present, and shows them if they are absent. The change takes effect on the screen, and also on any output if the browser is printed.

If the **Hide Grid** menu item is clicked, the grid disappears and the menu item changes to read **Show Grid**. If the **Show Grid** menu item is then clicked, the grid reappears and the menu item changes to read **Hide Grid**.

CHAPTER 7

THE MAPS MENU

7.1 INTRODUCTION

Most of the operations directly related to the specification and creation of a thematic map, and to the adjustment of map characteristics, are carried out using the Maps menu. The Maps menu can be used to set or modify some of the presentation features of a standard (i.e., non-thematic) road map, as well as to instruct the RMS to create a thematic map based on a prior dynamic segmentation operation.

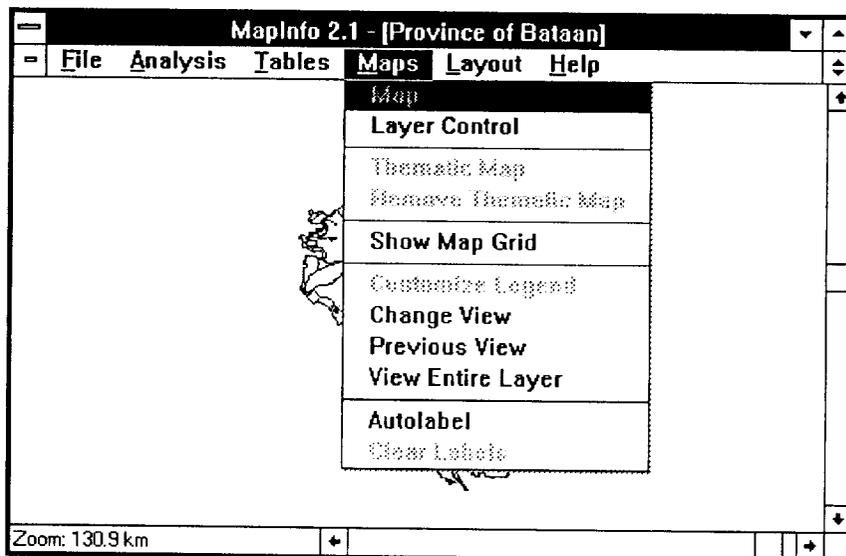


Figure 22

The menu items contained in the menu are as follows:

- menu item **Map**, which is used to create a mapper window;
- menu item **Layer Control**, which is a pass-through to the MapInfo menu item of the same name; it allows the specification of the ordering and display features of each layer in a mapper;
- menu item **Thematic Map**, which creates a thematic map based on one of the available feature attributes; either a standard or a user-defined legend can be used for the thematic mapping;
- menu item **Remove Thematic Map**, which removes the thematic map and the standard or user-defined legend on the screen.

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- menu item **Show/Hide Map Grid**, which turns the map grids on and off
- menu item **Customize Legend**, which allows the user to edit the legend box that is automatically created by some mapping operations;
- menu item **Redraw Window**, which will completely redraw the map on the screen.
- menu item **Change View**, which allows the user to directly specify the zoom level, the scale or the center position of a mapper;
- menu item **Previous View**, which redisplay the mapper view that was in effect before the most recent change of view;
- menu item **View Entire Layer**, which changes the active mapper's zoom level, scale and/or center position so that all the objects on a chosen layer (or on all layers) are visible on the screen; and
- menu item **Autolabel**, which automatically labels (i.e., creates text information associated with) a random selection of the objects in a selected layer of the active mapper;
- menu item **Clear Labels**, which erases from the screen any label information which may have been generated with the **Label** menu item or the Label Tool in the MapInfo tool palette.

Each of these menu items will be discussed in turn.

7.2 MAP

The main purpose of the **Map** menu item is to create a mapper window. Normally the **Setup Base Map** and the **Setup Data** menus will result in the creation of a suitable mapper for the base map on the screen. If, however, this mapper is closed, the **Map** menu item can be used to create a new mapper. Some adjustment of layers and their properties may be necessary to recreate a previous mapper configuration; this can be done with the **Layer Control** menu item, described next.

7.3 LAYER CONTROL

The **Layer Control** menu item is a pass-through to the MapInfo menu item of the same name. When clicked on, the **Layer Control** menu item displays a list of layers (tables) in the active mapper and allows a number of display characteristics for each layer to be individually controlled and customized. (see Figure 23) A full description of the options provided by this menu item can be found in the MapInfo Reference. The following paragraphs simply summarize some of the possibilities.

Any individual layer of the active mapper can be removed from the mapper, and conversely, an open table can be added to the mapper as a new layer (of course, this only makes sense if the table relates to the same geographic area as the other layers in the mapper). Removing a layer from the mapper does not close the table or cause the information in it to be lost.

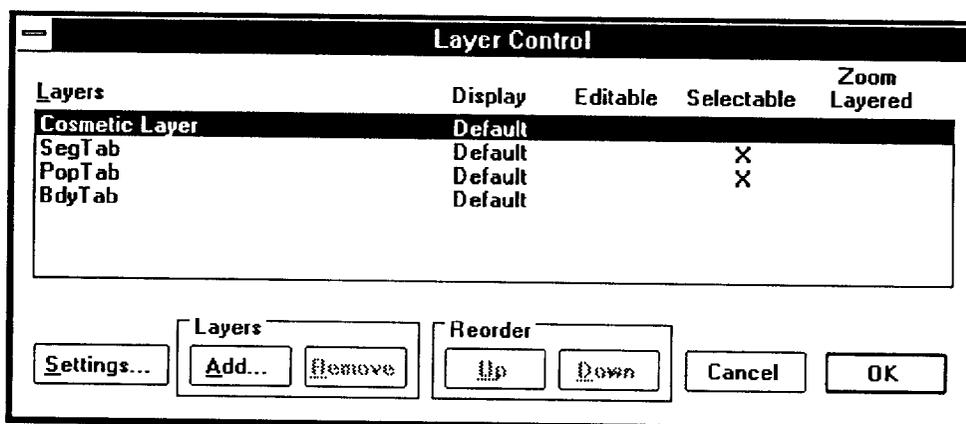


Figure 23

The order of layers in the mapper can be changed. The layers in the list displayed by the **Layer Control** menu item are drawn on the screen in bottom to top order. Any object in a layer that is higher in the list will be drawn over objects in layers that are lower in the list. Similarly, objects from different layers that overlay each other will be selected (with the Select Tool or the Info Tool, for example) in top to bottom order. Thus, by changing the order of layers in the mapper, the drawing and selection characteristics of the mapper can be changed.

In addition, any layer can be made either selectable or not selectable through the **Layer Control** menu item. Objects in a non-selectable layer cannot be selected by clicking on them (although the **Select** menu item in the Analyze menu can still be used to select any item including those on non-selectable layers).

If required, a layer can be displayed only if the zoom level is between user-specified minimum and maximum values. (This feature is not currently of much use in the RMS, but can be convenient in more general MapInfo applications.)

The means of labelling layer information is also specified through this menu item. Through the *Label Settings* subcommand, the user can specify the particular attribute (field) to be used for labelling, the type of line to be drawn between the label and the object being labelled (these lines are known as *call outs*), and the text style to be used in annotating the map.

For further details on the capabilities and use of the **Layer Control** menu item, the MapInfo documentation should be consulted.

7.4 THEMATIC MAP

Clicking on the **Thematic Map** menu item displays a dialog box containing a scrollable list of currently-defined attributes(see Figure 24); these are the attributes used in the most recent dynamic segmentation operation. Each attribute in the RMS has a standard thematic presentation defined for it; for example, the standard thematic presentation of pavement width is with lines having different thicknesses corresponding to different ranges of pavement width. Clicking on one of the defined attributes and on the *OK* button causes a thematic map with the standard presentation of the selected attribute to be displayed on the screen; a standard legend is also displayed in a separate window.

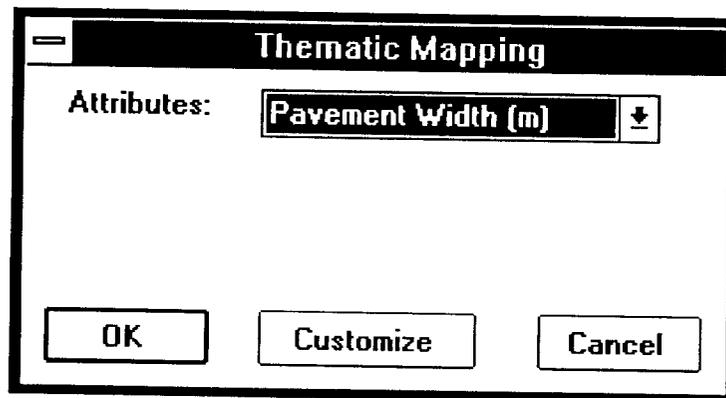


Figure 24

If several attributes are available (either because the feature selected for dynamic segmentation contains several attributes, or because the dynamic segmentation was done using a merged feature file), the **Thematic Map** menu item can be clicked on repeatedly to thematically present the data corresponding to each attribute. If the user selects the standardized presentation option for an attribute for which no standardized presentation has been defined, the RMS issues a warning.

It may also happen that the user wishes to prepare a non-standard presentation of the available attribute data. Examples of non-standard presentations might include:

- presentations which highlight one particular value or range of attribute values, and downplay all other values; for example, the user may want to highlight only road sections whose width is greater than 12 meters;
- presentations based on an algebraic or logical expression involving several feature attributes; for example, the user may want to highlight only those road sections whose width is less than 6 meters and whose AADT is greater than 30,000 vehicles/day.

The **Thematic Map** menu item allows customized presentations through the *Customize* button in the dialog box. Clicking on this button gives access to the standard MapInfo **Thematic Map** menu item, which allows full user control over the values or ranges of interest, and the

symbols which will be used to display each of these. The MapInfo documentation describes the options in detail in Appendix 7 of the MapInfo [Reference](#).

7.5 REMOVE THEMATIC MAP

As the menu item title implies, clicking the **Remove Thematic Map** item will removed the existing thematic map on the screen together with the legend window. This function is only available after performing the Thematic Map function.

7.6 SHOW/HIDE MAP GRID

This menu item shows the map grids in referenced to Zone 51 of the Universal Transverse Mercator(UTM) projection(see section 2.1). if they are not on the screen and removes them if they are present. The map grids are contained on a layer called MAPGRID which is added to the mapper or removed from the mapper based on the menu item that is available.

If the **Hide Map Grid** menu item is clicked, the grid disappears and the menu item changes to read **Show Map Grid**. If the **Show Map Grid** menu item is then clicked, the grid reappears and the menu item changes to read **Hide Map Grid**.

7.7 CUSTOMIZE LEGEND

The **Customize Legend** menu item is a direct pass-through to the MapInfo menu item of the same name. It allows the user to customize the information displayed in a thematic map legend. The legend's title and subtitle, the annotation written for each value or range of values in the thematic map and the text style used for the display of each of these, can all be modified by the user(see Figure 25).

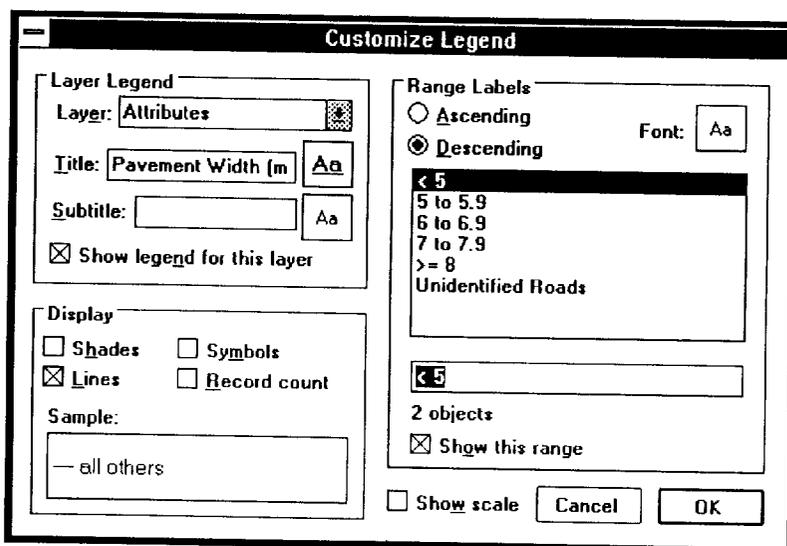


Figure 25

This **Customize Legend** menu item is probably of most use when the user decides to prepare a customized thematic map through use of the *Customize* button in the **Thematic Map** dialog box.

7.8 REDRAW WINDOW

The **Redraw Window** menu item is a direct pass-through to the MapInfo menu item of the same name, which allows the user to redraw the map on the screen. This is most useful when the generation of the drawing was interrupted by pressing the <ESCAPE> key.

When click on this menu item, the system completely redraws the active window

7.9 CHANGE VIEW

Clicking on the **Change View** menu item gives access to the **Change View** dialog box which was discussed in section 3.4 above; this dialog box can also be accessed by clicking on the annotation in the bottom left-hand portion of a mapper window. It allows the zoom level, scale and center position of a mapper to be directly specified.

7.10 PREVIOUS VIEW

The **Previous View** menu item simply recalls the view on the screen before the most recent change of zoom level, scale or center position. The change in zoom level, scale or center position might have occurred as a result of the **Change View** menu item or through one of view-changing tools in the MapInfo tool palette (the Grabber, Zoom In or Zoom Out tools). It is not possible to recall views earlier than the most recent one.

7.11 VIEW ENTIRE LAYER

The **View Entire Layer** menu item adjusts the view in the mapper so that all graphic objects belonging to a user-specified layer (or to all layers) are visible.

If there is only one layer in the active mapper, the **View Entire Layer** menu item adjusts the mapper's view without further user interaction. If there are several layers in the mapper, the menu item displays a dialog box which asks the user to select one of the available layers or all of them. Clicking on the appropriate choice and on the *OK* button then changes the mapper's view.

7.12 AUTOLABEL

The **Autolabel** menu item is a pass-through to the MapInfo menu item of the same name. Clicking on this menu item will cause labels to be written on the mapper for a user-specified layer. However, the user has no control over how many or which particular objects will be labelled; for example, if the user requests the PopTab layer to be labelled, there is no way to ensure that the provincial capital will be one of the objects that is labelled. Similarly, there is no way to control the placement of labels. The procedure is purely automatic.

On the other hand, the user can control which field of the selected layer will provide the information written to the screen, and the text style with which the information will be written; this is done with the **Layer Control** menu item discussed above.

7.13 CLEAR LABELS

The **Clear Labels** menu item simply erases all labels or other temporary information which may have been written to the screen during an RMS session. After the user clicks on the menu item, the RMS asks the user to confirm the erasure by displaying the message "Discard all objects on the Cosmetic Layer?". The appropriate reply, if erasure is really wanted, is to click on the *Discard* button; clicking on the *Cancel* button will restore the screen without erasing anything.

CHAPTER 8

THE LAYOUT MENU

8.1 INTRODUCTION

As explained in section 3.6, a layout is a type of window which allows detailed user control over the format and output presentation style of one or more mappers and/or browsers. Without layouts, users are only able to print or plot browsers or mappers just as they appear on the computer screen. With layouts, it becomes possible to prepare titles or title blocks, annotations, to arrange several types of window on a single sheet of paper, or to wallpaper a map or table (i.e., to print or plot it on several sheets of paper which are then fit together to make a larger-sized output). Layouts can also be used to predefine templates, which are general formats for presenting mapper or browser data; a particular mapper or browser is then included in the template and a final-form presentation can be made ready will minimum additional work.

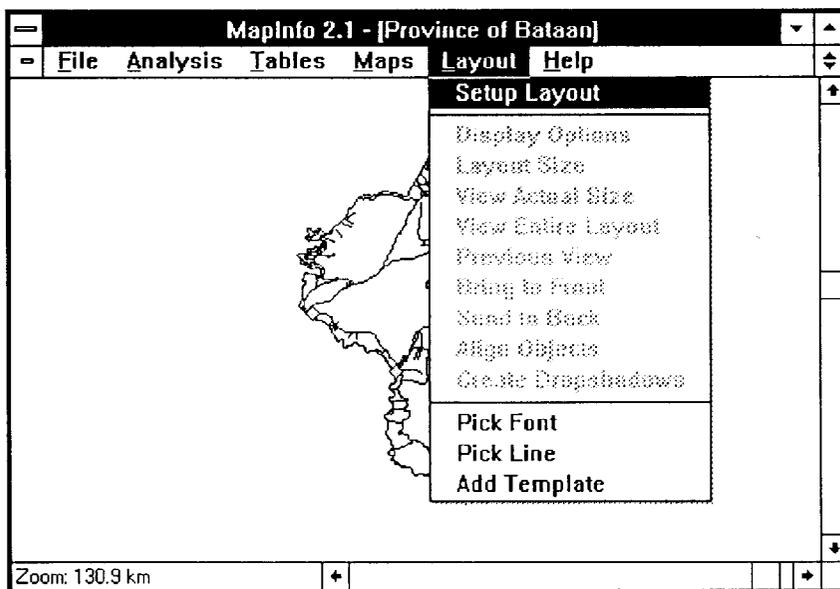


Figure 26

The RMS Layout menu is a direct pass-through to the MapInfo menu of the same name; all menu items are identical. The MapInfo Layout menu and its menu items are documented in the MapInfo Reference and in Chapter 10 of the User's Guide.

Proficiency with layouts only comes with practice. MapInfo layouts have a number of quirks which must be gotten used to. One of the less intuitive aspects of layouts is that the appearance of text on the screen does not usually resemble its appearance when it is output. For example, a particular text may appear not to be centered even though a command to center it was issued. Furthermore, the actual (i.e., printout) size of text in frames depends

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on the zoom level of the underlying mapper window, whereas the actual size of text inserted directly into the layout window is invariant.

Despite its peculiar appearance on the screen, if the appropriate formatting commands were correctly issued, text will appear as it should on the output. Again, it will take time and practice to become familiar with the use of layout windows and the Layout menu.

8.2 SETUP LAYOUT

Before opening a layout window with the **Setup Layout** menu item, users should make sure that the output device type and paper size specified with the File|**Print Setup** menu item (see section 4.4) are correct. All work done in the Layout menu implicitly refers to the paper size and output device type. If these are incorrectly specified, the results of outputting the layout are unpredictable.

Once the correct output device type and paper size have been set, clicking on the **Setup Layout** menu item will open the **New Layout Window** dialog box. Option buttons provide for the creation of a single frame for the active mapper window (or any other particular open window), or of one frame for each of the open windows, or no frame at all; in the latter case, the Mapinfo Frame Tool from the tool palette can be used when required to define frames within the layout window.

In any case, the actual shape of the mapper or browser image within a frame will be based on the shape of the mapper or browser window. By resizing these windows (see section 3.3.2.3) the correspondence between frame and image sizes and shapes can be changed.

8.3 DISPLAY OPTIONS

Clicking on the **Display Options** menu item opens the **Layout Display Options** dialog box. This dialog box was already discussed in section 3.6 above. Most of the preset options are unlikely to need changing by the user; the only display option that might usefully be changed by this menu item is the layout zoom level, expressed as a percentage of actual output size.

8.4 LAYOUT SIZE

Clicking on the **Layout Size** menu item opens the **Layout Size** dialog box. With this dialog box, the user can set the margins of the output page(s) and indicate if the output is to be wallpapered (the output will be spread over several sheets of paper and then fit together by hand) or directed to a single sheet of paper.

8.5 VIEW ACTUAL SIZE

The **View Actual Size** menu item adjusts the layout zoom level to 100% ; in other words, the image on the screen is (approximately) the same size as the image on the printout or plot.

(Computer screen adjustments and other factors make it difficult to guarantee that the screen image will be exactly the same size as the output image.)

8.6 VIEW ENTIRE LAYOUT

In a sense, the **View Entire Layout** menu item is the inverse of the **View Actual Size** menu item. It zooms to the level necessary to display the entire output (one or several pages) within the layout window on the screen.

8.7 PREVIOUS VIEW

The Layout|**Previous View** menu item is identical in function to the Map|**Previous View** menu item. It redraws the layout window as it was before the most recent change of zoom or position. Such changes might have been produced by the **Display Options**, **View Actual Size** or **View Entire Layout** menu items discussed in previous sections, or might have been produced using the Zoom In, Zoom Out, or Grabber tools from the MapInfo tool palette.

Only the most recent view can be restored; earlier views are lost and must be recreated through appropriate use of the positioning and sizing tools and menu items.

8.8 BRING TO FRONT

Because a layout window may contain various objects (frames, text annotations, graphic objects, etc.) and because these objects may overlap, the Layout menu provides a means of ensuring that one object overlays (and partially hides) another. This is the **Bring to Front** menu item. Clicking on an object with the Select tool then clicking on the **Bring to Front** menu item will ensure that the selected object is not wholly or partially covered in the output.

8.9 SEND TO BACK

The **Send to Back** menu item is the inverse of the **Bring to Front** menu item. Clicking on an object in the layout window, then clicking on the **Send to Back** menu item, will ensure that the object does not cover any other object on the output.

8.10 ALIGN OBJECTS

The **Align Objects** menu item is used to ensure that objects in the layout window are positioned correctly with respect to each other or to the output. Selected objects can be positioned so that their left edge, center or right edge are horizontally aligned with respect to each other or to the layout itself; similarly, selected objects' top edge, center or bottom edge can also be aligned with respect to each other or to the layout. Selected objects can also be evenly distributed with respect to each other in either the horizontal or the vertical

direction.

8.11 CREATE DROPSHADOWS

Finally, the **Create Drop Shadows** menu item draws drop shadows around selected items. Clicking the menu item opens a dialog box which allows the user to specify the horizontal and vertical distance separating the drop shadow from the selected item(s). Drop shadows can be used to enhance the presentation of selected layout objects.

8.12 PICK FONT

Pick Font menu item allows the user to choose a font for labelling or text. Choosing this menu item will give the user a dialog box that contains the font, font size and style feature. The font can be picked by holding the mouse button down while dragging the cursor on the font the user wants, release the mouse button and the font is selected.

As the user performs the different operations in the dialog box the Sample Text window displays a sample of the type style.

The user can use the **Pick Font** menu item together with the **Select** menu item of the Analyze menu to change the font on an existing text.

8.13 PICK LINE

Clicking the **Pick Line** menu item allows the user to set the default line style and change the line style object being edited. The dialog box displays the Line Palette, which allows the user to choose the color, width and style of the pen MapInfo uses. As the user changes the various attributes of the line style, a sample line is displayed in the left part of the dialog.

8.14 ADD TEMPLATE

A *template* is a standardized layout of a sheet of paper of a given size. It can include *frames* in which the contents of on-screen windows will appear with a certain rectangular size and position, as well as independent text and symbols (title blocks, scales, etc.) in pre-positioned locations. The **Add Template** menu item allows predefined templates to be brought to the screen. It displays a dialog box with a list of defined MapInfo workspaces (which can contain, among other things, template definitions). By clicking on one of these and on the *Open* button, the corresponding template is brought to the screen. Double-clicking on a frame opens a dialog box which allows the frame to be assigned to one of the on-screen windows. (For this reason, templates should normally be added only after all required mappers and browsers are already open.) Double-clicking on independent items allows their contents or position to be changed.

CHAPTER 9

THE HELP MENU

9.1 INTRODUCTION

The Help Menu is consists of two menu items

- menu item **Contents** which allows the user to view the help file
- menu item **About Road Mapping System** which shows the version of RMS

9.2 CONTENTS

The **Contents** menu item will open the RMS help file. Three buttons are provided which correspond to the operation listed below.

CONTINUE button will allow the user to view the next screen of a given topic;

QUIT HELP button will exit the help screen and return the control to the RMS;

SEARCH button will provide a scrollable list box of topics based on the menu and menu items of the RMS. Double click on any of the desired topic will show the said topic on the screen.

9.3 ABOUT ROAD MAPPING SYSTEM

About Road Mapping System(RMS) displays a dialog box which shows which release of RMS Software currently running.

APPENDIX A

RMS Installation Guide

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SYSTEM REQUIREMENTS :

In order for RMS to run the following requirements are needed :

HARDWARE :

- Any 80286,80386 or 80486 based microcomputer with at least 4 MBytes of RAM.
- Any monitor supported by Microsoft Windows. For best results, a VGA color monitor is recommended.
- A mouse supported by Microsoft Windows
- A Hard Disk Drive with 10 MBytes of disk space for program and feature files. Depending on the number of provinces to be installed (estimatly 600 Kbytes for each provinces), it will require additional disk space.
- a printer or plotter (optional)

SOFTWARE :

- Microsoft Windows 3.0 or later installed on the hard disk and running on standard or enhanced mode
- MapInfo for Windows ver 2.1 or later installed on the hard disk
- RMS Installation Diskettes

SOFTWARE PACKAGE :

The software package is consist of the following :

- Installation disk (1 High Density 3.5 inch diskette) ;
- Feature Files Data Disk (1 High Density 3.5 inch diskette) ;
- a USER, System Maintenance Guide and System Documentation;
- Spatial Files Data Disk (High Density 3.5 inch diskettes);
- RMS Program Disk (High Density 3.5 inch diskette)

INSTALLATION PROCEDURE :

The System Requirements(both hardware and Software) have to be met in order to effectively run the RMS.

Insert the RMS installation disk in drive B:.Invoke the installation procedure by typing :

```
B:  
INSTALL
```

The system will give a step by step procedures on how to use RMS Installation Software.

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During the installation the following have to be entered :

1. Windows Directory
2. MapInfo Directory
3. RMS System Directory (the directory where to install RMS, the default directory is \RMS)
4. RMS Feature Files Directory
5. RMS Spatial File Directory

The RMS install will then create the RMS, Feature Files and Spatial Files directory based on what was specified (If the directory did not exist). Copying of files is automatic.

FEATURE FILES AND SPATIAL FILES :

All Feature Files and Spatial files will be stored in the directories that were provided. Feature data files are supplied on a separate disk (Feature File Data Disk). Spatial Files are organized by province. Spatial file data diskettes (which are numbered) have subdirectories corresponding to individual provinces, with nothing in the diskette's root directories.

In installing the Spatial Files, a menu will be provided that consists of the list of provinces. The Enter key is used to Select/Unselect from the menu.

Choosing the menu item ALL PROVINCES will require at least 30 MBytes of disk space from the hard disk, since it will install all available provinces spatial files. Another alternative is installing only those provinces that are needed.

After pressing the ESC key, RMS will start installing the provinces that were selected. It will ask for the diskette/s that contain the province/s to be inserted and start copying the file to the Spatial File directory. It can be run again to install additional Spatial files if needed.

The Spatial Files can also be copied to the Spatial Directory using the DOS Copy or XCopy Command. A file SFILES.LOC is provided which contains the list of province with their corresponding disk number and directories.

RMS.INI :

The RMS.INI is the configuration file of the RMS Software in the Mapinfo directory. It is the first file needed by the system in order to run. It contains the list of directories needed by the system.

- Windows Directory
- Mapinfo Directory
- RMS System Directory
- Feature File Directory
- Spatial Files Directory

There are three ways to create or change the RMS.INI :

- by running the RMS Installation Software, the RMS.INI will be automatically created ;
- using the PREFERENCES menu item from the RMS Software (see Users' Manual);
- using a text editor.

CONFIG.SYS :

The number of files in the Config.Sys must be increased depending on the number of Spatial Files(Provinces) that will be opened.

CREATING A RMS ICON :

Creating the RMS icon (Program item) will have to be done under the windows environment. It is recommended to create the RMS program item under the MapInfo group.

How to create a program item ?

- 1 - Open the Mapinfo Group
- 2 - From the File menu in Program Manager, choose New.
- 3 - Select the Program Item option, and then choose the OK button, the program item properties dialog appears
- 4 - Type the following on the Program Properties Dialog Box
 - Description : RMS
 - Command Line : RMS.exe
 - Working Directory : RMS Directory (ex C:\RMS)
 - Shortcut Keys : None
- 5 - Choose the Change Icon button to see the RMS icon then choose the OK button.
- 6 - Choose the Ok button, the dialog boxes closes and the RMS Program Item appears on the MapInfo Group.

RMS USER'S MANUAL :

The RMS User's Manual is contained in the file USRDOC.RMS in RMS User Documentationl Diskette. You can print it using Wordperfect 5.1

RMS PROGRAM DISK :

The RMS Program Disk contains the following files

- ADPTINS.LSP
- POPINS.LSP
- FEABLK.LSP
- IMPBDY.MBX
- IMPPOP.MBX
- IMPSEG.MBX
- IDENT1.MBX
- IDENT3.MBX
- UPDATAD.MBX
- UPDATE1.MBX

HOW TO RUN RMS :

RMS can only run under the windows environment

- 1 - from the MapInfo Software, choose the USRPRO.MBX using the RUN menu item. (see MapInfo Manual for more information)
- 2 - Clicking on the RMS Icon

APPENDIX B

Modifying RMS Spatial and Feature Data

The RMS Software does not allow you to modify the Spatial and Features Data since the System Administrator and not the System User/Operator is assigned to do this task. The System Administrator should have an adequate knowledge of not only MapInfo but also AutoCAD and ArcCaD in order to accomplish the task.

Chapter 3, 4 and 5 of the System Maintenance Guide Documentation contains the step by step procedure to modify the Spatial Data and Feature Data. All the programs (AutoLISP and MapBasic) needed in the modifications of Spatial and Feature Data are provided in the RMS Program Disk which is included in the package.

The System Documentation explains how the system works and will be a great help in providing information to the System Administrator.

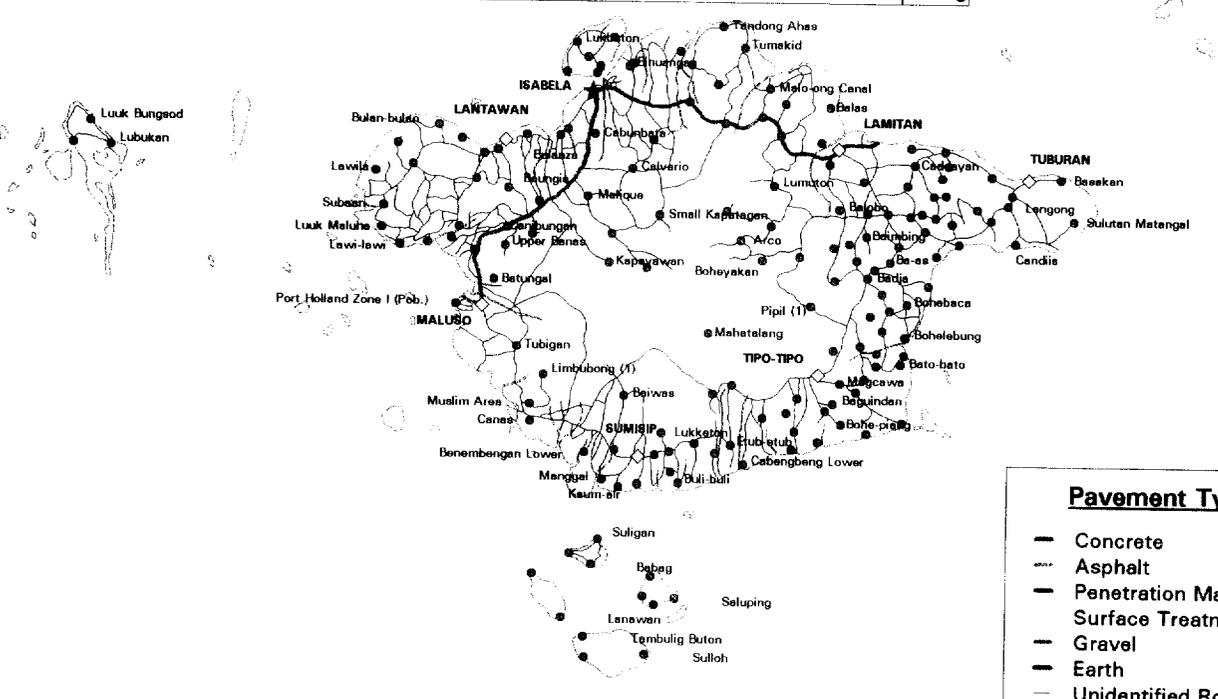
APPENDIX C

Sample Reports

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Province	Road	Kpo	Kpe	Type
07	7281	0.000	5.400	2
07	7281	5.400	7.000	5
07	7281	7.000	9.000	2
07	7281	9.000	10.410	5
07	7281	10.410	14.940	5
07	7281	14.940	20.900	2
07	7281	20.900	31.790	5
07	9892	0.000	7.380	2
07	9892	7.380	8.000	2
07	9892	8.000	15.610	2
07	9892	15.610	17.500	5
07	9892	17.500	30.760	2
07	P0001	28.050	29.550	6
07	P0002	71.300	73.500	5
07	P0003	23.700	51.900	5

Code	Name	Type
0701000	ISABELA	2
0702000	LAMITAN	4
0703000	LANTAWAN	4
0704000	MALUSO	4
0705000	SUMISIP	4
0706000	TIPO-TIPO	4
0707000	TUBURAN	4
0706001	Amaloy	5
0702001	Arco	5
0702002	Ba-as	5
0705034	Babag	5
0705001	Bacung	5
0706002	Badja	5
0703018	Bagbagon	5
0706017	Baguindan	5
0702004	Baimbing	5
0705045	Baiwas	5
0702005	Balagtasan	5



Pavement Type	
—	Concrete
----	Asphalt
—	Penetration Macadam
—	Surface Treatment
—	Gravel
—	Earth
—	Unidentified Roads

CADD MAPPING PROJECT
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 RURAL INFRASTRUCTURE FUND

Louis Berger International, Inc.
 CERTEZA Surveying and
 AEROPHOTO SYSTEMS, INC.

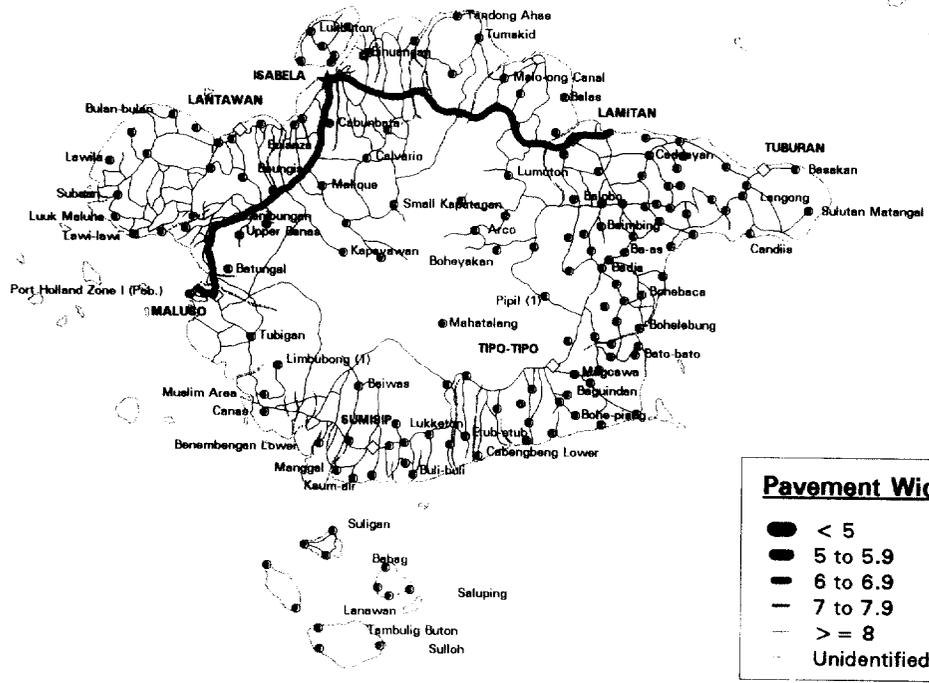
Province of BASILAN

Scale: 1:50,000

Legend for Population Centers	
★	Provincial Capital
▲	Chartered City
◇	Municipality
●	Barangay

tdo

Code	Name	Type				
0701000	ISABELA	2				
0702000	LAMITAN	4				
0703000	LANTAWAN	4				
0704000	MALUSO	4				
0705000	SUMISIP	4				
0706000	TIPO-TIPO	4				
0707000	TUBURAN	4				
Province	Road	Kpo	Kpe	Width		
0706001	Amaloy	07	7281	0.000	5.400	6.5
0702001	Arco	07	7281	5.400	7.000	6.5
0702002	Ba-as	07	7281	7.000	9.000	6.5
0705034	Babag	07	7281	9.000	10.410	6.5
0705001	Bacung	07	7281	10.410	14.940	6.5
0706002	Badja	07	7281	14.940	20.900	6.5
0703018	Bagbagon	07	7281	20.900	31.790	6.5
0706017	Baguindan	07	9892	0.000	7.380	6.5
0702004	Baimbing	07	9892	7.380	8.000	6.5
0705045	Baiwas	07	9892	8.000	15.610	6.5
0702005	Balagtasan	07	9892	15.610	17.500	6.5
		07	9892	17.500	30.760	6.5



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Province of BASILAN

Scale: 1:50,000

Legend for Population Centers

- ★ Provincial Capital
- ▲ Chartered City
- ◇ Municipality
- Barangay

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