



Domesday Retrieval Software Functional Specification

BBC Television

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TITLE : Domesday Retrieval Software
Functional Specification

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SYNOPSIS : Defines the functions provided by
the Retrieval Software in the BBC
Domesday system. This software is
used to access data on the
Community and National Domesday
videodiscs.

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1. INTRODUCTION

The aim of the Domesday project is to produce an interactive PAL videodisc system which enables a user to view a snapshot of life in Britain in the 1980's on a television screen. All the data which comprises the snapshot is stored on two videodiscs which are accessed by a Philips LaserVision videodisc player. The player is specially modified to handle digital data stored in place of the audio signal on the videodiscs and to enable control by a microcomputer.

The videodiscs are called the Community disc and the National disc. The Community disc contains information about every locality in Britain, much of which has been collected by the schoolchildren of the various areas. Both sides of the disc contain data; the two sides are called the Southern side and the Northern side. The National disc contains official statistical data and other information from official sources; only one side of this disc contains data.

This specification defines the functionality of the software which runs in the microcomputer. This software accepts instructions from a user, reads appropriate photographs and data from the videodisc, formats it for display and outputs it to the user. It also provides for output of the data to other peripherals, such as a printer and a floppy disc, and provides 'Help' information to the user. The software is termed 'the Domesday Retrieval Software'.

The hardware and software comprising the Domesday system is termed 'the system' in the remainder of this document.

It should be noted that the functions defined in this specification represent the ideal full functionality for the Retrieval Software. The actual software as implemented excludes those functions listed in Appendix B. No changes to functions defined in this specification will be made unless they are approved in a change control procedure which is to be defined.

2. PERIPHERALS SUPPORTED

2.1 User Input Devices

The input devices available for input of instructions to the system are as follows:

- microcomputer keyboard,
- mouse,
- tracker ball.

The keyboard is always available and any number and combination of the other devices may also be available.

The software is written so that drivers for other input devices, for example a touchscreen, may also be used. These drivers are not part of this specification, but their use is described in section 7, User Extensions.

2.2 User Output Devices

The output devices available for output of data from the system are as follows:

- colour monitor with RGB input capability,
- printer,
- floppy disc drive.

The colour monitor is always available and any number and combination of the other devices may also be available.

The software is written so that drivers for other output devices, for example a cassette tape recorder, may also be used. These drivers are not part of this specification, but their use is described in section 7, User Extensions.

3. GENERAL FEATURES OF OPERATION

3.1 Available User Input Devices

3.1.1 Mouse and Tracker Ball Input

A tracker ball appears the same to the system as a mouse. All subsequent references to mouse operation are also applicable to tracker ball operation.

A mouse has two action buttons which are used to enter commands to the system. These are denoted by ACTION and CHANGE in this document. It is also used to give the system a position on the screen that the user is indicating. When the mouse is moved across a flat surface, the indicated position on the screen changes accordingly. The indicated position is shown on the screen using a screen pointer which is an icon (see section 3.2.2). The icon is an arrow which points north-west.

3.1.2 Keyboard Input

All single-keypress keyboard inputs are recognised by the system. All inputs which combine two or more keypresses are ignored except SHIFT and any character key.

There is a card insert above the function keys and the ESCAPE and BREAK keys which is coloured cyan above keys f0, f2, f4 and f6, yellow above keys f1, f3 and f5, and white above the remainder. The insert labels the keys as follows:

ESCAPE - Restart
f0 - Menu
f1 - Help
f7 - Previous
f8 - Next
f9 - Clear/Restore
BREAK - OFF

The keyboard can be used to mimic the functions of a mouse, whether or not a mouse is present. The RETURN key has the same effect as the ACTION mouse key and the TAB key has the same effect as the CHANGE mouse key.

The four cursor movement keys <, >, ^ and v can be used individually to move the pointer in the indicated direction. The pointer moves continuously while the key is held down, starting at a speed of 50 pixels/sec. After 1/2 second the pointer accelerates to 150 pixels/sec and

after a further 1/2 second to 250 pixels/sec. If the key is released and pressed again, the pointer reverts to a speed of 50 pixels/sec.

3.2 Layout of the Screen

During the majority of operations, the screen has a fixed layout which is described below. Other layouts used are described with the operations using them.

The screen displays graphical and textual output from the microcomputer and video output from the videodisc. Unless otherwise noted in the descriptions of specific operations, output from the videodisc is not visible through parts of the screen occupied by output from the microcomputer.

The screen contains an area which has the dimensions of the area addressable by the microcomputer; this area is termed the 'micro display' and occupies almost the whole area of the screen. The precise area of the micro display and its position on the screen depend on the adjustment of the display monitor. Pictures from the videodisc are not restricted to the micro display and occupy the total area of the screen. The micro display is 320 pixels wide and 256 pixels high. One pixel has an aspect ratio (width/height) of 12/13. The resolution of the display is one pixel.

The display colours are default colours only and are read from the System Configuration Profile at a cold start. They may be changed by the user as part of the Help operation (see section 6.4.1).

Some displays use 'drop shadow'. Drop shadow is an effect which makes symbols and text more visible when displayed over pictures. A drop shadow symbol is displayed in yellow, overprinted on the same symbol displayed in dark blue and shifted 2 pixels to the right and 2 pixels below the yellow symbol. Hence only the edges of the dark blue symbol are visible under the yellow symbol.

3.2.1 Format of Text

The area occupied by a character is 8 pixels high and varies in width according to which character is being displayed; characters are therefore termed 'proportionally spaced'. The left-hand pixel column of each character is not part of the character pattern; this gives spacing between characters. The widths of the character areas for the various characters are as

follows:

- 8 pixels: \$ & M W m q w ~
- 7 pixels: % * + - / 0 1 2 3 4 5 6 7 8 9 < = > ? @
A B C D E F G H I J K L N O P Q R S T U V X Y Z \ ^ #
a b c d e g h k n o p r s u v x y z
- 6 pixels: space " [] f t { }
- 5 pixels: ' () i j l
- 4 pixels: , : ;
- 3 pixels: ! . |

Some operations produce 'normally spaced' text, in which every character occupies an area 8 pixels wide. Whether text is normally or proportionally spaced, no more than 40 characters are displayed on one line. The Help facility provides an option to deselect proportional spacing - when this is done, all text is displayed normally spaced. It should be when normally spaced some messages will not fit on the screen and are truncated.

In the overlay operation (see section 5.7), neither the proportionally spaced nor the normally spaced character sets can be used due to the demands on the system of displaying up to 16 colours. Instead a specially defined character set is used which mimics the normally spaced set as closely as possible.

The zero ('0') is always displayed without a diagonal bar through it.

3.2.2 Icons

On some displays, 'icons' are used. These are symbols which occupy an area 16 * 16 pixels. They are shown in solid yellow and are surrounded with a black outline which extends one pixel around the border of the icon.

3.2.3 Message Area

The message area is a strip at the top of the micro display 12 pixels high which is used to display messages and prompts for the user. It is coloured cyan and contains one line of dark blue characters. The cyan strip occupies the entire width of the message area.

3.2.4 Menu Bar

The menu bar is a strip 12 pixels high and the width of the micro display which starts one pixel above the bottom of the micro display. It is the user's means of selecting various operations in the system. It is made up of 7 boxes of alternating cyan and yellow, starting with a cyan box. Text can appear in each box to indicate the operation represented by the box and is in dark blue characters, centred vertically and horizontally in the box. A box extends at least 8 pixels horizontally on either side of the text; an empty box is at least 16 pixels wide. In this document, empty menu bar boxes are denoted by a line of hyphens: -----

3.2.5 Clearing Microcomputer Output from the Display

Key f9 toggles the text/graphics display from the microcomputer on and off so that the video output from the videodisc can be viewed alone. When the microcomputer output is off, pressing any key on the keyboard restores it. This keypress is not echoed and has no other effect.

3.3 Method of Selection of Operations to Perform

3.3.1 Selection Via the Menu Bar

When the system has been started up and is ready to accept commands from the user, the menu bar is 'on', ie displayed. The 7 boxes in the menu bar correspond to the 7 keys f0 - f6. An operation is selected either by moving the pointer into a box and pressing ACTION, or by pressing one of the keys f0 - f6.

The left-hand box always contains a dark blue triangle which points to the left. The dark blue triangle turns off the menu bar and causes a solid yellow triangle to be displayed in the same position as the dark blue triangle. It is 8 pixels wide, is displayed in drop shadow and points to the right. When the screen pointer is moved within the triangle and ACTION is pressed, or if key f0 is pressed, the yellow triangle disappears and the menu bar reappears.

The second menu bar box always contains 'Help' except in the Help operation when it contains 'Exit'. It is used to initiate the Help operation appropriate to the operation being performed. The available Help facilities are further described in section 6. The contents of the remaining boxes depend on the user's position within the

system, but in general the method of operation is as follows:

The operations available from either the Community disc system or the National disc system have a tree-like structure. At the top level of the tree, the available branches are shown in boxes 4 - 7, numbering from the left. There are two methods of moving through the tree; by choosing a top-level operation or (for the Community disc only) by choosing the box 3 operation, which is labelled 'Options'. If one of the top-level branches is chosen, that operation is initiated and the next operation on the branch is shown in the selected box. The remaining top-level boxes are unchanged. If 'Options' is chosen, boxes 4 - 7 contain available options, which may be discrete operations or sub-trees from which further options are available. Throughout the Options operation, box 3 contains 'Main', enabling the user to return directly to the top-level operation from which Options was selected.

A box may be empty if there is no further operation in the branch or if an operation is unavailable for the particular data being accessed. Some operations do not change the menu bar as described above; these exceptions are noted with the detailed operation descriptions. When the menu bar is off, the mouse cannot be used to select menu bar operations and keys f2 - f6 are ignored.

3.3.2 Other Methods of Selection

There are two methods of operation selection other than via the menu bar; these are by responding to textual prompts displayed in the message area or by using the screen pointer. The availability of these methods depends on the operation being performed.

To respond to a textual prompt, the user types an appropriate textual reply and presses ACTION. Where multi-line responses are permitted, the user continues typing the response after each line of the reply area is filled. The characters are automatically echoed on the next line of the reply area. If a word is unfinished when a line is filled, the unfinished part is moved to the start of the next line before further characters are echoed.

To use the screen pointer to select an operation, the user moves it to the desired place and presses ACTION. The area of the screen in which the pointer may be moved for this method of selection is an area 320 pixels wide by 222 pixels high in the centre of the micro display;

this is termed the 'display area'. Note that this leaves two unused strips in the micro display which separate the display area from the message area and the menu bar; the upper strip is 3 pixels high and the lower is 6 pixels high.

The action taken by the system if the user attempts to move the pointer out of the display area is as follows:

Attempted movements over the West border of the display area cause the pointer to stop with the tip of the arrow touching the border. An attempted movement over the East border causes the pointer to stop with the tip of the arrow touching the border and the part of the pointer over the border made invisible.

If the pointer is moved over the upper edge of the display in general it has no function and the system gives a low soft beep if ACTION or CHANGE is pressed. The action of the pointer, where it has meaning above the upper edge of the display area, is described in the relevant section of the specification.

If the pointer is moved over the lower edge of the display area, it changes from an arrow icon to a cross icon whether the menu bar is on or not. The point indicated by the cross is at its centre. An attempted movement below the menu bar causes the pointer to stop with the centre of the cross touching the bottom border of the menu bar and the part of the cross under the menu bar made invisible. If a valid menu selection is made when the centre of the cross is in the lower unused strip, the operation selected is that in the box immediately below the cross.

3.3.3 Movement Through Sequences of Text or Photographs

Some operations allow the user to display a sequence of photographs or a number of text pages. The user moves through these sequences in the following manner:

To move forward to the next photograph or text page, CHANGE is pressed with the screen pointer in the right-hand third of the display area or key f8 is pressed. To move backwards to the previous photograph or text page, CHANGE is pressed with the screen pointer in the left-hand third of the display area or key f7 is pressed. If an attempt is made to move beyond the beginning or end of the sequence, or if the pointer is in the central third of the screen when CHANGE is pressed, the display does not change and a soft low beep is output.

3.3.4 Selection of Items from Lists

Some operations allow the user to select an item from a numbered list of items on the screen. This is done as follows:

As the pointer is moved across the items in the list, the item number of an item is displayed in yellow if the pointer indicates any part of the item name or number. When ACTION is pressed, the item whose number is shown in yellow is the one selected.

3.3.5 Error Messages

Error messages are displayed in the message area and when a message is displayed a soft low beep is output. The error message remains displayed for between 2 and 4 seconds, during which time the system is quiescent and makes no response to input from any input devices. After this time the message is removed and the system returns to the state it was in just before the erroneous input was performed.

3.3.6 The ESCAPE and BREAK Keys

When the ESCAPE key is pressed, the system performs a 'warm start'. In a warm start, the startup film is not shown and the system starts from the top-level operation on the videodisc which is loaded. In addition, default configuration values are not reloaded and the various drivers which were in use during the previous session continue to be used.

When the BREAK key is pressed, the screen is cleared and the following message is displayed in the display area, in cyan:

Are you sure you wish to switch off the system (y/n)?

If the response is 'y' or 'Y', the screen clears and the system becomes quiescent; all floppy disc files are closed. The following message is displayed in the centre of the display area, in cyan:

Press the ESCAPE key to restart

The system can then be powered down. To restart from the quiescent state, the ESCAPE key (labelled RESTART) is pressed; a cold start is then performed.

If any other response is given to the 'Are you sure...'

question, the system continues from its state before the BREAK key was pressed.

3.4 Output of Domesday Data to External Devices

In some functions, Print and Write functions are provided on the menu bar. These allow data to be output to a printer or floppy disc drive. The drivers used in these functions can be changed (see section 7, User Extensions) to access different types of printer or mass storage device.

3.4.1 Print

When Print is selected, the text on the screen is output to the printer. No graphical data is printed.

3.4.2 Write

When Write is selected, the data associated with the current screen display is output to a 'dump file' on the floppy disc drive. The filename used is **DOMnnnn**, where **nnnn** is a sequence number. This number is initialised to 0001 at cold start and is incremented by one after each Write operation is performed. If a dump file of the same name already exists in the directory being written to, it is deleted and a new dump file created. The first 3 characters of the filename can be changed in the Reconfigure operation (see section 6.4.5).

The precise format of the data in a dump file is to be specified. All data is written as ASCII characters. For textual displays, the text on the screen is output. For chart and graph displays all the numeric data in the relevant dataset is copied from the videodisc to the floppy disc in unpacked format. For overlay displays, the data copied is limited to that associated with the geographical area shown on the display.

4. COMMUNITY DISC FUNCTIONS

4.1 Maps Stored on the Community Disc

Great Britain is divided for the purposes of the Domesday system into the following areas:

- a) The Channel Isles,
- b) Southern England and Wales,
- c) Northern England and Scotland,
- d) Northern Ireland,
- e) The Isle of Man,
- f) The Orkneys and Shetlands.

The maps stored are of 6 types; these are termed 'level 0' to 'level 5' maps. Each map is a photograph stored as a video image on the videodisc.

The level 0 map covers the entire Domesday area.

Each of the 6 level 1 maps is a map of one of the areas listed above, at an appropriate scale.

If the level 1 maps are considered as consisting of a grid of 40km * 30km rectangles, there is one level 2 map for each rectangle, although each map covers an area larger than the rectangle. The scale of each level 2 map allows the rectangle covered by the map to exactly fill the display area.

If the level 2 maps are considered as consisting of a grid of 4km * 3km rectangles, there is one level 3 map for each rectangle, although each map covers an area larger than the rectangle. The scale of each level 3 map allows the rectangle covered by the map to exactly fill the display area.

For some areas of special interest, level 4 maps are held which show an area of .8 km * .6 km in the display area. For some other areas, level 5 maps are held; these maps are not necessarily of a standard scale and may depict views other than plans.

The distinction between Northern England and Southern England is defined by an imaginary band termed 'the Domesday Wall'. It is straight and is bounded by grid references 0450 and 0480 North. Northern England starts at the lower edge of the band and Southern England starts at the upper edge of the band; hence the two areas overlap each other in the band. No maps are cut by the edges of the band.

All level 0, level 1 and level 2 maps are held on both sides of the Community videodisc. The level 3, level 4 and level 5 maps are split between the two sides such that the Southern side contains maps for areas a) and b) (see list above) and the Northern side contains maps for areas c), d), e) and f). Level 3, 4 and 5 maps for areas within the Domesday Wall are held on both sides.

4.2 Initial Actions

When the system is powered up with the Community disc installed, a 'cold start' is performed. The default configuration values are loaded from the System Configuration Profile. A 30 second video sequence with sound is then shown. The sequence can be interrupted by the use of the ESCAPE key; this causes the immediate display of the level 0 map.

After the startup sequence, the level 0 map is displayed on the screen. If the Southern side of the videodisc is being played, the area indicated by the current pointer position is highlighted and the following text is displayed in the message area:

Community Disc - Southern Side

If the Northern side of the videodisc is being played, the area indicated by the current pointer position is highlighted and the following text is displayed in the message area:

Community Disc - Northern Side

The top-level operations available on the Community disc are shown in Figure 4.1. When the initial actions are complete, the system is automatically left in the Map operation.

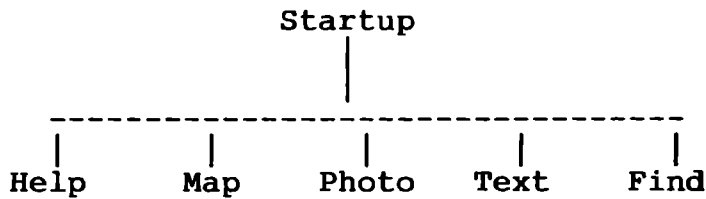


Figure 4.1 - Top-level Community Disc Operations

4.3 Map Operation - Main Functions

Whenever a map is displayed in the Map operation and the menu bar is on, the display area is outlined by a yellow border one pixel wide. The border is not displayed for level 5 maps.

The initial menu bar for the map operation is as follows:

< Help Options Out Photo Text Find

The Out box is empty if a level 0 map is being displayed; the Options box is empty if a level 5 map is being displayed; the Photo or Text boxes are empty if no photographs or text exist for the map being displayed.

If the user moves the screen pointer on the level 0 map, the highlighting from the initial actions disappears and each of the 6 individual areas is highlighted as the pointer enters it. This highlighting is not done by the microcomputer, but by using 6 video frames. Each frame contains an identical level 0 map with a different area highlighted in video. From this point, the user can zoom in, zoom out or move to an adjacent map. These actions are described in the following sections. Each map may have associated with it some text and photographs.

4.3.1 Zoom In

This facility is available from all level 0, level 1 and level 2 maps and from some level 3 and level 4 maps. The user moves the pointer to the area to be examined in more detail and presses ACTION. The next higher level map containing the area indicated by the pointer is displayed.

During the inter-map black, an expanding yellow framework is generated. This starts as a rectangle drawn on the old map which has the size and position of the new map, and ends coincident with the yellow rectangle surrounding the display area. This feature does not operate during a zoom from a level 0 map to a level 1 map. When the new map is a level 5 map, the rectangle disappears as soon as it reaches the edge of the display area.

On level 3 maps, the presence of a level 4 map for an area is shown by a yellow box which encompasses the area of the level 4 map. On level 4 maps, the presence of a level 5 map for an area is shown by a yellow box which encompasses the area of the level 5 map. Zooming in from a level 3 map is only possible when the pointer is in the yellow box indicating a level 4 map, and similarly for zooming in from level 4 maps.

If an attempted zoom is not possible, one of the following error messages is shown in the message area:

No further zoom is possible here

Turn videodisc over for more detail in this area

If the zoom was disallowed because the required map was on the other side of the videodisc, this map is automatically displayed if the system detects that the correct side of the videodisc is accessible.

4.3.2 Zoom Out

This facility is available from all maps except the level 0 map and is effected by selecting Out from the menu bar. The next lower level map for the area currently being shown is displayed.

During the inter-map black, a shrinking yellow framework is generated which starts as the border of the old map and ends as a rectangle on the new map which indicates the position of the old map. This feature does not operate during a zoom out from a level 1 map to the level 0 map; instead the area containing the pointer is highlighted as described in section 4.3. When the new map is a level 1 or level 2 map, the rectangle disappears as soon as the screen pointer is moved.

4.3.3 Move

Using Move, the user can display any one of the maps adjacent to the currently displayed map and at the same level. Diagonal moves are permitted; hence there are up to 8 maps adjacent to a map.

This facility is available from level 1, level 2 and level 3 maps and is effected by pressing the CHANGE BUTTON. The position of the screen pointer when the CHANGE button is pressed determines which adjacent map is to be shown; the available directions of movement are shown in Figure 4.2. If the pointer is in the rectangular area in the centre of the display area, no movement takes place and a soft low beep is output.

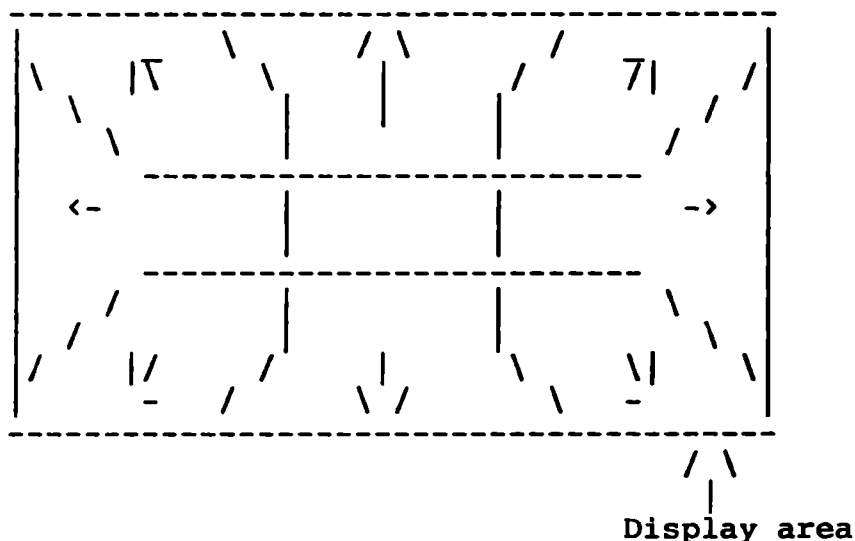


Figure 4.2 - Moving Maps by Mouse or Keyboard

To move using the keyboard, the user presses the SHIFT key and one of the four cursor movement keys, depending on the direction of the desired move. A diagonal move is effected from the keyboard by performing a sideways move and an upwards or downwards move.

While the move is taking place, an arrow appears in the centre of the display area and moves in the direction of the move. When it reaches the edge of the micro display,

it reappears on the other side of the screen and continues moving. It disappears when it reaches the centre of the new map. The arrow is dark blue and similar in shape to the screen pointer, but twice as large.

If an attempted move is not possible, one of the following error messages is shown in the message area:

~~Only sea in this direction~~ *No map available in this direction...*

Turn videodisc over for maps to the North/South

If the move was disallowed because the required map was on the other side of the videodisc, this map is automatically displayed if the system detects that the correct side of the videodisc is accessible.

4.4 Map Operation - Options

The available Map options are shown in Figure 4.3.

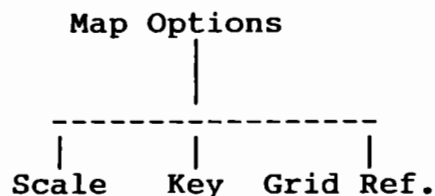


Figure 4.3 - Map Options

If Options is selected from the top-level Map menu bar, the following menu bar is displayed for map levels 1, 2, 3 or 4:

< Help Main Scale Key Grid Reference

The menu bar displayed for map level 0 does not include the Grid Reference option, it is replaced by a blank box on the menu bar. The menu bar displayed for map level 5 has the Options box replaced by a blank as no options are available.

4.4.1 Scale

Sub-options available from Scale are shown in Figure 4.4.

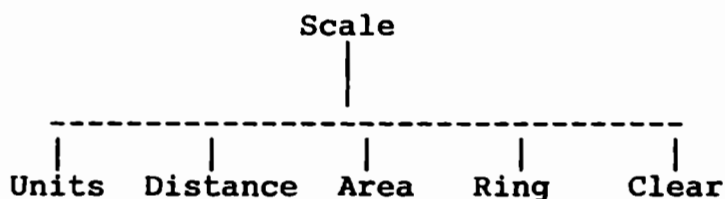


Figure 4.4 - Scale Options

Selecting Scale at map levels 2 or 3 displays 'kilometres' in the message area, followed by a scale bar. The scale bar is a horizontal line with small vertical graduation lines above it marked every kilometre. The scale line is at the bottom of the message area so that it touches the part of the map below the message area. It is positioned so that the vertical graduation lines align with the vertical grid lines on the map. At levels 0 and 1 the graduations are marked every 100 km and '100' appears after the scale bar. At level 4 the scale is in single metres and the word 'metres' appears instead of 'kilometres'.

4.4.2 Distance

The following menu bar is displayed selecting Scale and the Distance operation is automatically selected.

< Help Main Units Clear Area Ring

While in the Distance operation, the user moves the pointer within the display area and presses ACTION. The first time this is done, a blue cross icon is displayed at the pointer position. The pointer position at this stage is termed the 'old position'. The user then moves the pointer to another position on the map and presses ACTION again; the pointer position now is termed the 'new position'. A dark blue line is drawn from the old position to the new position. This process is termed 'banding' and may be repeated any number of times.

In addition, whenever ACTION is pressed after the first

time, the cumulative distance is displayed to the left of the unit name in the named units and ranged right.

4.4.3 Units

Selection of Units toggles the calculations and displays in the Scale operations between metric and imperial units; miles are used for kilometres and yards are used for metres. At levels 0 and 1, distances are displayed to an accuracy of 1km or 1 mile. At level 2, the accuracy is 1/10 km or 1/10 mile. At level 3 the accuracy is 1/100 km or 1/100 mile and at level 4 the accuracy is 10m or 10 yards. Selecting Units does not change the menu bar.

4.4.4 Area

If Area is selected, the following menu bar is displayed:

< Help Main Units Distance Clear Ring

In the Area operation, the scale bar is removed and 'square kilometres/metres/miles/yards' is shown in the message area. The user bands the pointer in the display area until an enclosed area has been drawn; this is when the pointer indicates one of the 9 pixels in the 3 pixel * 3 pixel square at the centre of the start cross. The area is then shown in the message area to the left of the unit name in the named units and ranged right. The accuracy of the area value is the same as that of the distance value for that level.

If all this information will not fit in one line then as many characters as is necessary are deleted from the ends of the two units strings. If the two numbers alone (radius followed by area) will not fit then just the area is shown.

4.4.5 Ring

If Ring is selected, the menu bar is as follows:

< Help Main Units Distance Area Clear

In the Ring operation, if ACTION is pressed, a blue cross icon is displayed at the pointer position. As the pointer is moved, the distance from the cross to the pointer is displayed in the message area in the appropriate units. If ACTION is pressed again, a circle is drawn around the cross with its circumference passing through the pointer position and the area enclosed by

the circle is shown to the right of the radius value in the appropriate units. Accuracies used are as for the Area and Distance operations. If the pointer is moved again, the radius value continues to change and the previous area value remains displayed. Another circle can be drawn, in which case the new area replaces the previous area. The process may be repeated as many times as is desired.

The resulting line is arranged:

<Radius value> <Radius units> <Area value> <Area units>

across the screen, each field is separated by a space.

In the Area and Ring operations, the CHANGE key may be used to highlight the last area or circle drawn. If this is done, the menu bar and message area are also highlighted and any text in them disappears. The normal display can be restored using the same key.

4.4.6 Clear

Selection of Clear restarts any Scale operation and clears the display area of graphical output. Selection of Distance, Area or Ring also performs a Clear, except that if Area is selected while in Distance, any banding already present in the display area is retained and becomes part of the outline of the area to be measured.

4.4.7 Key

The following menu bar is displayed when Key is selected:

< Help Main

Also displayed is the first in a sequence of video photographs, each showing part of the legend for the current map level. The complete sequence can be examined in the manner described in section 3.3.3.

When any photograph in the sequence is displayed apart from the first, the following menu bar is displayed:

< Help Main First

Selection of First redisplayes the first photograph in the sequence and removes First from the bar.

4.4.8 Grid reference

The menu bar does not change when this option is selected. The following text appears in the message area:

National Grid Ref

When ACTION is pressed, the grid reference at the pointer is displayed in the message area. To the left of the text it appears in 8-digit format; to the right of the text it appears in letters-and-digits format. The resolution of the grid reference depends on the current map level as follows:

Levels 0 and 1: To 10 km, eg 052 015 and TQ 2 5.

Levels 2 and 3: To 1 km, eg 0526 0158 and TQ 26 58.

Level 2: To 1/10 km, eg 05268 01583 and TQ 268 583.

When map moves are made, the option remains active. It is cancelled when a different Map option is selected or when Main is selected.

4.5 Photo Operation - Main Functions

Each map stored on the Community disc can have a sequence of photographs associated with it; this operation is used to view the photographs. The Photo operation can either be entered from the top-level menu or from the Find operation (see section 4.9). It can only be entered from the top-level menu if the map being displayed has at least one photograph associated with it. If there are no photographs associated with the displayed map, the Photo box on the top-level menu is empty.

When the Photo operation is entered, one of the photographs in the sequence associated with the displayed map is displayed. This is the first in the sequence if the operation has been entered from the top-level menu or any one in the sequence if the operation has been entered from the Find operation. The menu bar is as follows:

< Help Options Map Clear Text Find

If no text is available for the map being displayed, the Text box is empty.

The complete sequence can be examined in the manner described in section 3.3.3. Each photograph is displayed with a short caption which fits on one line and is shown in the centre of a line 25 pixels above the top of the menu bar. The text is in yellow with drop shadow. This caption can be 'hit' in the Find operation (see section 4.9).

If Clear is selected, the short caption is cleared from the display and the menu bar changes to:

< Help Options Map Caption Text Find

If Caption is selected, the short caption reappears and the original menu bar is restored.

4.6 Photo Operation - Options

The available Photo options are shown in Figure 4.5.

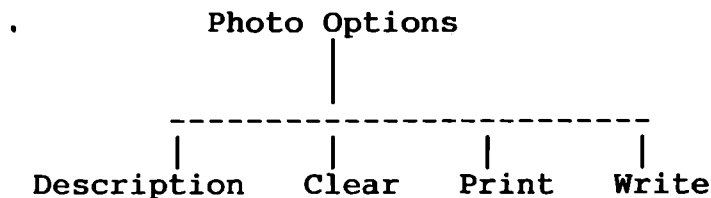


Figure 4.5 - Photo Options

The following menu bar is displayed when Options is selected:

< Help Main Description Clear Print Write

If no long caption is available for the photograph being displayed, the Description box is empty.

4.6.1 Description

When Description is selected, a long caption of up to 8 lines is displayed over the displayed photograph. The format of the text is the same as the format of the short caption. The text is ranged downwards, with the last line of the text positioned 25 pixels above the menu bar. 'Clear' appears in the Description box and

'Caption' appears in the Clear box. Caption can then be selected to restore the short caption.

4.6.2 Clear

Clear is used to clear either the short or long caption, depending on which box the word appears in. If the long caption is cleared, the word 'Description' is restored in the Description box of the menu. If the short caption is cleared, the word 'Caption' appears in the Clear box.

4.6.3 Print

When Print is selected, the screen display is printed as described in section 3.4.1.

4.6.4 Write

When Write is selected, the screen display is written to the floppy disc drive as described in section 3.4.2.

4.7 Text Operation - Main Functions

Each map on the Community disc can have a piece of text associated with it. The text can be in one of two forms; these are termed 'schools form' and 'free form'. Schools form text for a map is up to 20 pages of text. Each page is on a different topic and has a title, which can be 'hit' in the Find operation (see section 4.9). Free form text for a map is an article with an unlimited number of pages of text, the first page of which is generally a contents page which summarises the contents of the article. The whole article has one title, which can be a 'hit' in the Find operation; in addition each section of the article has a section name which can also be a 'hit'.

The Text operation can either be entered from the top-level menu or from the Find operation (see section 4.9). It can only be entered from the top-level menu if the map being displayed has at least one page of text associated with it. If there is no text associated with the displayed map, the Text box on the top-level menu is empty.

When the Text operation is entered, the menu bar is as follows:

< Help Options Map Photo ----- Find

If no photograph is available for the current map sequence, the Photo box is empty.

4.7.1 Viewing Schools Form Text

When the Text operation is entered, an index page is displayed. This contains a header and a text body. The header is a dark blue bar containing **TEXT INDEX** centred and in yellow. The letters-and-digits form of the grid reference of the current map is displayed ranged right and in cyan; the 8-digit form is displayed ranged left and in cyan. For level 0 and 1 maps, region names are displayed instead of grid references and are displayed ranged right and in cyan (eg **United Kingdom, Southern Britain**). The header is displayed in the message area.

The text body of the index page is up to 20 lines in cyan and not proportionally spaced. A blank line separates the text body from the header. Each line lists the page number and title of the page. The lines are listed in order of page number, eg

1	Dance Halls in Streatham
2	Chip Shops in Streatham

A text page is selected for display in the manner described in section 3.3.4.

A text page has a header and a text body. The header is a dark blue bar containing the page title ranged left and in yellow, and the page number ranged right and in cyan, eg

Chip Shops in Streatham	Page 2
--------------------------------	---------------

The header is displayed in the message area.

The text body is up to 22 lines and in general will be displayed proportionally spaced, ranged left with an inset left margin and in cyan. The text body is separated from the header by one empty line. Text can have certain special features as follows:

- Individual words can be marked for highlighting, and if so are displayed in yellow.
- Individual pages can be marked for no proportional spacing. If so, normal spacing with no indentation is used.

The menu bar is now:

< **Help** **Options** **Map** **Photo** **Index** **Find**

If Index is selected, the index page is redisplayed and the Index box in the menu bar is made empty.

The complete sequence of text pages for the current map can be examined in the manner described in section 3.3.3.

4.7.2 Viewing Free Form Text

When the Text operation is entered, the first page of the free form text is displayed; this is a contents page. The header is a dark blue bar containing the article title ranged left and in yellow, and the page number ranged right and in cyan. The page number is in the form '1 of n', where n is the total number of pages in the article, eg

Scottish Chip-oil in the Eighties

Page 1 of 82

The header is displayed in the message area. If the header will not fit on the screen then the text 'Page' is deleted.

The text body is up to 20 lines in cyan and not proportionally spaced. A blank line separates the text body from the header. Each line lists a section number, the name of the section and the page number on which the section starts. The lines are listed in the order of the sections within the article, eg

1	Chip-oil Manufacturers in Dundee	2
2	Great Chip-oil Drinkers of Glasgow	5

The contents page can also contain titles of other articles; these are listed after all the sections in the current article. The section number and page number fields are blank for these titles except that the section number field for the first of the titles contains See:.

The first page of a section or article is selected for display in the manner described in section 3.3.4.

When an article page has been displayed, the menu bar is:

< Help Options Map Photo Contents Find

If Contents is selected, the contents page of the article is displayed and the Contents box in the menu bar is made empty.

The remaining pages in a section can be examined in the manner described in section 3.3.3 and sections before or after the selected section can be reviewed in this way as well. The pages have the same format as the schools form text pages. The first page of each section contains the section name in the header; other pages of a section have no title in the header. If a header contains only a page number, the dark blue background bar is not shown. The page number for all pages has the form 'x of n', where x is the page number within the article and n is the total number of pages in the article.

4.8 Text Operation - Options

The available Text options are shown in Figure 4.6.

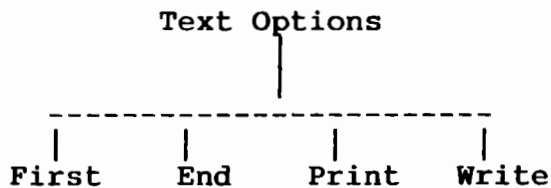


Figure 4.6 - Text Options

The following menu bar is displayed when Options is selected:

< Help Main First End Print Write

If the first page of the text (ie the index page for schools form text or the contents page for free form text) is already being displayed, then the First box is empty. If the last page of the text is already being displayed then the End box is empty.

4.8.1 First

When First is selected, the first page of the text is displayed and the First box on the menu bar is made empty. The first page is the index page for schools form text and the contents page for free form text.

4.8.2 End

When End is selected, the last page of the text is displayed and the End box on the menu bar is made empty.

4.8.3 Print

When Print is selected, the screen display is printed as described in section 3.4.1.

4.8.4 Write

When Write is selected, the screen display is written to the floppy disc drive as described in section 3.4.2.

4.9 Find Operation

The Find operation is in one of two states when it is selected. The first state is 'no existing hit list' and is the state when the Find operation is first used.

The second state is 'hit list being reviewed' and is the state entered when a query has produced a list of at least two items which have been found. Once the Find operation is in the 'hit list being reviewed' state, it stays in this state until Main is selected from the Index operation (see section 4.9.5).

The 'hit list being reviewed' state has two sub-states: 'query map still current' and 'query map changed'. The query map is the map which was being displayed when the query was performed; the former sub-state is in force unless the current map displayed is different from the query map.

When the Find operation is selected, the action of the system depends on the state of the operation as follows:

- In 'no existing hit list state': Find menu displayed; current map not cleared; menu bar is:

< Help ----- Map Photo Text

- In 'hit list being reviewed' state; 'query map still current' sub-state: Index operation entered (see section 4.9.5).

- In 'hit list being reviewed' state; 'query map changed' sub-state: Find menu displayed; menu bar is:

< Help ----- Map Photo Text Old

The Find menu is a menu displayed in the display area in yellow with drop shadow. Its format is shown in Figure 4.7. On the figure, single quotes surround the three areas where responses can be entered by the user; these are shown as three solid dark blue rectangles on the displayed menu.

```

Map by Grid Reference: '
Map by Place Name:
'
'
Text and Photos by Topic:
'
'
'
```

Previous Query:

Percent through the search:

Number of 'perfect matches' found:

Scope of Search limited to <Photographs or Text>

Figure 4.7 - The Find Menu

In the three lines below the 'Previous Query' heading is displayed the query (if any) entered the last time the Find operation was performed. Cyan letters are used, with valid stemmed keywords shown in yellow.

The scope of search line is used to indicate if the Reconfigure option to limit the data items to be included in the search has been used. If the scope of the search has not been restricted then that line is not shown on the screen at all.

The following actions may now be performed by the user:

- Movement to another map, as described in section 4.3.3,
- Selection of a map by grid reference,
- Selection of a map by place name,
- Query of the database of text and photographs.

When the screen pointer is moved into one of the dark blue rectangles, the colour of the rectangle changes to cyan and the user can then type an entry into that rectangle. The entry appears in blue characters as it is being typed.

4.9.1 Selection of a Map by Grid Reference

A grid reference is entered in digit or letters-and-digits form and the ACTION key pressed. Grid references with a resolution of up to 100m can be specified. Examples of valid grid references are:

05268 01583, TQ 268 583 (resolution 100m);
052 015, TQ 2 5 (resolution 10km);
05 01 or TQ (resolution 100km).

The system then searches for the level 3 map containing the grid reference and displays a yellow cross icon at the point denoted by the grid reference. If the grid reference is for a location on the other side of the videodisc, the cross icon is shown on the relevant level 2 map instead.

If an invalid grid reference is entered, one of the following error messages is displayed:

Grid reference has invalid format

This grid reference is in the sea

Irish grid references can be ambiguous with some references in North Wales. If an ambiguous reference is entered, the following message is displayed in the message area:

Do you mean N Ireland or Wales (n/w)?

An answer of N or n indicates to the system that the grid reference is in Northern Ireland; an answer of W or w indicates Wales.

If a map is successfully displayed, the Map operation is

entered and the Map operation top-level menu bar is displayed.

4.9.2 Selection of a Map by Place Name

A place name of up to 80 characters is entered and the ACTION key pressed. The system displays a map with a level chosen as for the selection by grid reference (see section 4.9.1) and the Map operation is entered. The square kilometre containing the place name is highlighted for 32 seconds. The CHANGE key can be used to restore this highlighting and thence to toggle it off and on as desired. When the highlighting is on, the characters in the menu bar disappear. X

If a number of place name hits are found or if none are found, the Index operation is entered (see section 4.9.5).

4.9.3 Query of the Database of Text and Photographs

A list of keywords (in order of priority) of up to 120 characters long may be entered by the user. If a word is being typed when the end of a line is reached, the entire word is taken to the next line of the entry block and typing can continue. The DELETE key is used as a destructive backspace and the COPY key is used to copy the previous query to the new query space. The cursor movement keys < and > can be used to move the cursor left and right on a line; overtyping of characters is allowed. The ACTION key is used to pass the query to the system. When ACTION is pressed, the cyan fill is replaced by a blue fill in the entry rectangle and the characters change to cyan in colour.

The system then uses a stemming and indexing algorithm to create a list of items relevant to the query - these are photograph short captions, schools form topic titles, free form article titles and free form article section names. The list is in order such that the items considered most specific to the query are nearest the top. The photograph captions and text titles scanned in the search relate only to the map being displayed or to more detailed maps held for the same area.

The item list can take an appreciable time to construct (of the order of a few minutes). The construction time is much shorter for short queries. During the construction of the list, the keywords in the new query which have been found to index items are shown in yellow. In addition, the following information is displayed under the menu:

- percent through the search,
- number of 'perfect matches' found, ie items which are indexed by all the stemmed keywords in the query.

Both these values change as the search continues.

If only one hit is found, the Text or Photo operation is then entered, depending on the nature of the item.

If more than one hit is found, the Index operation is entered (see section 4.9.5) and the following message is displayed in the message area:

These items have been found

If no relevant items have been found, the Index operation is also entered and the message reads:

No relevant items found

4.9.4 Old

When Old is selected from the menu bar, the Index operation (see next section, 4.9.5) is entered and the user can continue reviewing hits found in the last query performed. In addition, the 'current map' becomes the map used when the previous query was performed. The current map is the map displayed when the Map operation is entered.

4.9.5 Index Operation

When the Index operation is entered, the menu bar is as follows:

< Help Main

If entered after an attempt to find a map by place name, the part of the place-names gazetteer nearest the name entered by the user is displayed. If entered after a query entry, only relevant items are displayed if any hits were found, or the start of the complete index of text and photograph titles is displayed if no hits were found. When the Old operation is used to return to the Index (see section 4.9.4), the screen of hits displayed is that which was last displayed in the previous use of Index.

The items are displayed 20 to a page in cyan and are not

proportionally spaced. The items are numbered beginning at 1 and continuing up to the maximum of 9999. The method described in section 3.3.3 is used to view other pages of the index list. There is a one-line overlap from one displayed page to the next.

If a query produces a large number of hits, the hits are grouped into 'bundles' of approximately 100 items. When the Index operation is first entered after a search is performed, the first screenful of hits from the first bundle is shown; the user may then page through the bundle forwards and backwards. If the user attempts to page beyond the end of a bundle, a search is initiated for the next bundle of hits. This search takes approximately the same time as that for the first bundle; during this time the percentage of the search completed and the number of perfect matches are displayed as described in section 4.9.3. Subsequent bundles are accessed in a similar manner.

An item in the displayed index is selected by moving the screen pointer to the required item and pressing ACTION. The Map, Text or Photo operation is then entered, depending on the nature of the item.

When Main is selected, the search is terminated and the Find menu is displayed with the Old box empty. This is the only method of changing the state of the Find operation from the 'hit list being reviewed state' to the 'no existing hit list' state.

5. NATIONAL DISC FUNCTIONS

5.1 Introduction

This section describes the services available when using the National Disc.

The National Disc holds information or data in different forms, these include text, photographs, graphs, tables, etc. Each of these datasets is called an item and may be selected for examination by the user.

An item may be selected by simply listing the **contents** of the videodisc and choosing an item, **finding** an item using the index, selecting an **area** of interest from the map presented, or finally by selecting an object of interest whilst **exploring** graphic representations of the contents of the videodisc.

This basic architecture is shown in Figure 5.1.

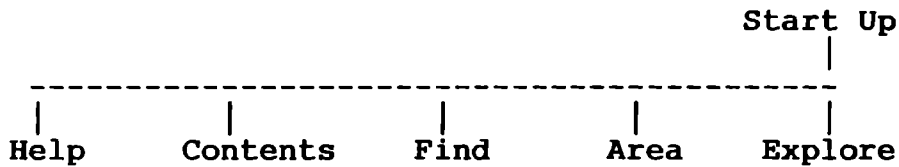


Figure 5.1 - Item Selection Operations

5.1.1 Contents

This operation lists the contents of the videodisc, the information is displayed using a hierarchial structure. The options available when using this operation are described in section 5.3.

5.1.2 Find

The user can specify one or more keywords, or a simple sentence which is decoded and used as an index into the contents of the disc. Described in section 5.4.

5.1.3 Area

The system displays a map on which the user can specify an area of interest which is then used as part of the Overlay item display criteria. See section 5.5.

5.1.4 Explore

The Explore operation is a special use of the Walk display technique to view photographic representations of the database contents. See section 5.12 on Walking. The user can specify one of the representations for further examination. The options available when using this operation are described in section 5.6.

Each item stored on the disc has associated with it a display technique, this technique is used to present that information. Selecting an item for display automatically defines the display technique. The display techniques employed on the National Disc are shown in Figure 5.2.

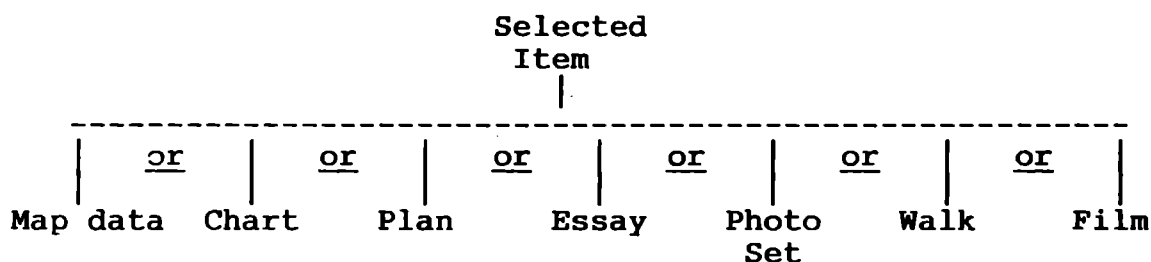


Figure 5.2 - Item Display Alternatives

5.1.5 Map data

The Mappable data display technique is used to generate digital maps of spatial data. If there is a background map then there will be a video underlay. For example, this technique would be used to display the 'Housing Density of Dover' over a base map showing Dover. The options available within this technique are described in Section 5.7.

5.1.6 Chart

This display is used to pictorially represent numerical sets of data. For example, a bar chart would be used to display the differences between the sales of National Newspapers over a period of time. See Section 5.8.

5.1.7 Plan

The Plan technique shows a photograph which includes a map showing all the occurrences of some feature. A map of the UK showing all the National Parks is an example of this form of display. Further described in Section 5.9.

5.1.8 Essay

This technique is used to display information held as text, this can include photographs showing figures, tables and diagrams. See Section 5.10.

5.1.9 Photo Set

This technique is used to display information held as one or more photographs. The options available within

this technique are described in Section 5.11.

5.1.10 Walk

This technique is a sophisticated way of viewing a coordinated set of photographs on a particular item. For example, a set of photographs showing the complete interior of a house may be examined by walking through them. Further described in Section 5.12.

5.1.11 Film

This technique involves turning over the videodisc and viewing one of the 1 minute films (Pictures and Sound) available. Further described in Section 5.13.

5.2 The National Disc Start Up Procedure

System initialisation consists of a 'cold start' up procedure. The default configuration values are loaded from the System Configuration Profile. A 30 second film presentation (sound and pictures) of the contents of the disc is then shown.

The menu bar is OFF during the film. The film shows an automatic explore of the gallery representing the data as in the manual Explore operation (see section 5.6). The user can interrupt the film at any time by pressing ESCAPE (labelled RESTART) this is termed a 'warm start'.

At the end of the film or following a warm start the user enters the Explore operation at the top level of the gallery with the menu bar ON and awaits the user's selection.

The menu bar available to the user for selection is:

< Help Main < move Back > move Top

Selecting an item for examination can be achieved in one of two ways:

1) continuing the Explore operation by hand and selecting an item, or

2) using the menu bar to select Main to exit Explore, this causes the menu bar to become:

< Help Explore Area Contents Find

and then selecting one of the three other major operations (Contents, Find or Area). The selected operation is then entered and an item may be selected.

Selecting Top from the Explore menu bar causes the Explore to be restarted from the top (or entry point) of the gallery (see section 5.6).

5.3 The Contents Item Selection Operation

5.3.1 Introduction

This operation lists the contents of the videodisc, the information is displayed using a many level hierarchial structure.

5.3.2 Operation

On entering this operation the top level disc contents is displayed on the screen arranged like this:

Domesday National Disc

British Life in the 1980's

Contents	Level 1
1	Society
2	The Economy
3	Culture
4	The Environment

All the text is displayed in cyan and is not proportionally spaced. The message area is not displayed.

The menu bar displayed at the bottom of the screen is:

< Help Explore Area ----- Find

This is called Level 1 of the Hierarchy.

The title is split over on the top line of the display area and the third line and are positioned centrally. The hierarchy level title ('Contents' in this case) is

left justified and the level identifier ('Level 1' in this case) is right justified and separated from the title by a single blank line.

The contents entries are aligned underneath separated from the heading by a single blank line, the text for the entry begins at column 11 to allow for an entry number up to 9999 followed by a space and the entry type of four characters followed by a space.

The numbers at the beginning of each line have no special meaning and are provided as an easy 'tag' for the entry.

The line layout is:

1234567890123456789012345678901234567890	-	Column Nos.
< > < > < >		
entry	entry	entry
number	type	text

The data items are coded on the screen into the 4 character data type field. The entry type field can be one of the following four character strings dependent on the entry type:

blank - for other Hierarchy Level entries,
 Text - for Essay type data items,
 Pic. - for Photoset type data items,
 Data - for Overlay or Chart type data items,
 Walk - for Surrogate journey type data items,
 Plan - for Plan type data items,
 Film - for moving Film (including sound) type data items.

Only 20 entries are allowed per Level and so will always fit on the screen and are numbered 1 to 21 on the screen.

The entry number part of the entry indicated by the current pointer position is highlighted to show it is the current entry which may be selected. If the pointer is not on an entry then nothing is highlighted. The item is actually selected by pressing ACTION. The highlighting is achieved by the entry number changing to yellow.

Any other entry may be selected by placing the pointer on that entry, which causes the entry number to be shown in yellow, and then pressing ACTION.

When an entry is selected its text becomes the title of the next screen and the entries at this level of the thesarus are displayed. For example if Culture was selected the screen looks like:

Culture	Level 2
1	Text Culture
2	Arts and Entertainment
3	Beliefs and Attitudes
4	Consumption
5	Customs and Traditions
6	Domestic Environment
7	Language
8	Leisure and Recreation
9	Lifestyle

This is called Level 2 of the hierarchy.

At level 2 and below the menu bar becomes:

< Help Explore Area Up Find

Also at level 2 and below an item of text type may appear at the top of the display with the same name as the level title. This item is seperated from the rest by a single blank line. Selecting this item produces a node essay, a text description, on this topic. If the node essay does not exist then the entry is not displayed. Essays are presented in exactly the same way as on the Community disc.

A further entry may be selected in the same way to proceed to the next level.

The user proceeds down the hierarchy selecting the entry of interest until the bottom level is reached (this may be level 2,3,4 or 5), this is the level at which the actual data items stored on the videodisc are displayed.

When the item name level is reached in the Contents operation the last entry in the menu bar is added giving the following:

< Help Explore Area Up Find Cross Ref

The pointer is used to scan the entries in the same way and an item may be selected for examination by pressing ACTION.

As explained in the introduction the selection of a data item also automatically specifies the display technique. If the data is to be displayed as an overlay then the Area Operation is automatically invoked unless an area is already selected (see section 5.5) before the data is displayed. In this way the map underlay will always be specified (it may have been specified to be blank). The user's current context within Contents is not lost, it is instead held and displayed on return from the data item display.

5.3.3 Find

Selecting Find from the menu bar exits the Contents operation and invokes the Find operation (see section 5.4). The user's current context within Contents is lost and s/he enters Find at the top level.

5.3.4 Up

Selecting Up causes the user to move up one level in the Thesaurus hierarchy, the entries for this level are redisplayed. Selecting Up again moves up another level until the top level is reached, at this point the Up option is removed from the menu bar.

5.3.5 Cross Ref

When this option is selected all the cross references recorded for that entry are displayed. Numbering of these cross referenced data items continues from where the numbering of primary data items finished. For example, if 15 primary data items were displayed then selecting Cross Ref will cause the cross references to be shown numbered from 16. The numbering may continue upto the maximum of 9999. The earlier 15 items remain available for a previous page move. The heading remains unchanged and the entries are coded as for the primary data items. If more than a screen full of cross references exist then they may be paged forwards and

backwards in the standard manner as described in section 3.3.3. Each page shows the heading.

5.3.6 Area

Like selecting Find, selecting Area exits the Contents operation and invokes the Area operation (see section 5.5). The user's current context within Contents is lost.

5.3.7 Explore

Like selecting Find and Area, selecting Explore exits the Contents operation and invokes the Explore operation (see section 5.6). The user's current context within Contents is lost.

5.4 The Find Item Selection Operation

5.4.1 Introduction

The Find operation on the National disc allows the user to specify one (or more) keyword(s), one (or more) data items name(s), or a simple sentence which is decoded and used as an index to select one (or more) data item(s) from the disc contents.

This operation provides a subset of the facilities of the Find Operation of the Community Disc (see section 4.9).

5.4.2 Operation

In the 'no existing hit list state' the Find menu is displayed with the menu bar:

```
< Help Explore Area Contents -----
```

In the 'hit list being reviewed' state the Find menu is displayed with the menu bar:

```
< Help Explore Area Contents Old
```

The Find operation for the National disc does not allow the user to specify maps by grid reference or place name as on the Community disc.

The Find menu for the National disc is:

Domesday National Disc

British Life in the 1980's

What do you want to know about?

! !
! !
! !

Previous Query:

Scope of Search limited to <Photographs, Text or Data>

Section 4.9.3 describes this display and the entry of queries. On the National disc any data item (not just Text and Photographs as on the Community disc) can be specified from the Find operation.

Sections 4.9.1 and 4.9.2 do not apply to the National disc.

5.5 The Area Selection Operation

5.5.1 Introduction

The Area operation allows the user to specify an area of interest for overlay purposes. A screen showing a map of the entire UK is provided together with a series of prompts to allow the area to be specified. For datasets with an overlay display format this area is then used as the background map for the display.

This operation may be explicitly invoked from the menu bar, this is called an 'unforced' Area operation.

As stated in the Contents section, if a data item is selected (using Contents, Find or Explore), and an area has not yet been specified then the Area operation is automatically invoked forcing the user to select an area before the overlay data is presented. This is called a 'forced' Area operation. In this case when an area has been successfully selected the user is shown the overlay for the data item already selected.

5.5.2 Operation

At the first stage of this operation the user is presented with a map of the entire UK positioned in the right hand side of the screen. This includes the islands off the Scottish coast, Northern Ireland and the Channel Islands. Different areas of the UK are represented by three different grid systems (Northern Ireland, Channel Islands and the rest). The UK map is shown with the Channel Isles and Northern Ireland in their own boxes to indicate the different grid systems. The islands off the Scottish coast are also shown in a separate box to compress the map to allow it to fit on the screen a little easier. These boxes are part of the map and are not added by the system.

If the Area operation has been used to successfully define an area previously in the current session then the outline of that area is shown as a blue rectangular box on the UK map.

The menu bar is:

< Help Explore ---- Contents Find

The areas available on the National disc are only ever used as backgrounds to Overlay data. Unlike on the Community disc specifying an Area does not limit the Find operation.

The area to be overlayed can be specified in one of three ways:

- 1) by grid reference (called grid), or
- 2) by special map name (called name), or
- 3) by using the pointer to draw a box on the display area (called box).

A series of prompts are positioned on the left hand half of the screen to enter the desired grid references or area name.

The area menu presented is:

Domesday National Disc

British Life in the 1980's

Type of area of interest (eg County):

< up to 30 characters >

Name of area of interest (eg Kent):

< up to 30 characters >

Grid Reference 1:

< up to 11 characters >

Grid Reference 2:

< up to 11 characters >

The two prompt areas (Grid and Name) where responses may be entered are shown as two solid dark blue rectangles on the screen. The colour yellow is used for the prompt text.

Moving the pointer into the prompt area causes that prompt area to change from dark blue to cyan (text in blue) as for the Find operation on the Community disc (see section 4.9).

5.5.3 Grid

The user may enter two grid references, corresponding to two diagonally opposed corners of the area.

To enter the two grid references the pointer is moved into the Reference 1/Reference 2 prompt area causing it to be highlighted as described above, the reference can then be entered from the keyboard. Moving the pointer to the Reference 2 prompt allows the second to be entered.

If the user enters text in one class of reply then moving the pointer into the other class does not cause it be highlighted and text cannot be entered. One class includes the grid references (Reference 1 and Reference 2 prompts) and the other is the name (Type and Name prompts).

The references are read and validated upon the user pressing ACTION. If they are valid a yellow rectangle is constructed and displayed with two of its corners as the grid references specified. If a previous user specified area exists it is first cleared from the display.

A grid reference is entered in digit or letters-and-digits form, resolutions up to 100m are allowed.

Once the Reference 1 field has been entered and the pointer is moved to the Reference 2 field a cross (yellow with a black mask) is shown on the map at the point corresponding to the Reference 1 entry. If the Reference 2 field is entered first then it is shown as a cross when the pointer is moved to the Reference 1 field.

If only the Reference 1 field is entered and ACTION pressed then the second reference is made equal to the first and the cross (yellow with a black mask) remains displayed at that point on the map.

If only the Reference 2 field is entered and ACTION pressed then the prompt:

Enter Grid Reference 1

appears in the message area inviting the user to specify the other reference. See section 3.3.5 on error messages.

Different areas of the UK are represented by three different grid systems (Northern Ireland, Channel Islands and the rest) both references specified must be within the same grid system. If this error is detected the following message is displayed in the message area:

Different Grid Systems specified

See section 3.3.5 on error messages.

Irish grid references can be ambiguous with the East/South/West references of North Wales. If one of these references is entered then the following message is displayed in the message area:

Do you mean N Ireland or Wales (n/w) ?

The user must then enter N, n, W or w and press ACTION to completely specify the reference.

The user may choose not to choose by selecting Find, Contents or Explore from the menu bar to exit the Area operation.

Channel Isles grid references can always be uniquely identified as they are larger numbers than any valid UK

references.

If any other error is detected in the entered grid reference (invalid characters, bad syntax, etc, see section 4.4.3 on allowable grid reference formats) then the messages displayed are:

Grid reference has invalid format

See section 3.3.5 on error messages.

If the area defined is OK then a yellow rectangle is drawn on the UK map representing it.

5.5.4 Name

All the special maps stored on the system to be used as background areas for overlay displays have a type and a name which is documented for the user in the Help facility (see section 6). The user may specify the area by entering its type and name followed by ACTION. If the area exists it is displayed as a yellow rectangle on the UK map and the corresponding special map is used as a background map during the overlay display.

If only the Type is entered and ACTION is pressed then the error message:

Enter Name

is displayed in the message area inviting the user to enter the name. Similarly if only the Name is entered and ACTION is pressed error message:

Enter Type

is displayed in the message area.

If the map specified does not exist then one of the following messages are displayed in the message area:

Area type not recognised - See Help

Area name not recognised - See Help

See section 3.3.5 on error messages.

If the area defined is OK then a yellow rectangle is drawn on the UK map representing it. The Grid references corresponding to the bottom left and top right hand corners are also shown in the Ref1 and Ref2 fields.

5.5.5 Box

The third way to specify an area of interest is to construct a box on the display area encompassing the area of interest.

The pointer is positioned at the beginning of the area and ACTION is pressed. A cross (yellow with a black mask) is displayed at this point to indicate drawing has commenced. The grid reference corresponding to the current position on the map is displayed in the Ref1 field. If a user defined area already existed on the screen it is cleared.

If ACTION is immediately pressed a second time then the second grid reference is made equal to the first and the cross remains displayed on the map at that point.

Now as the pointer is moved a rectangular box is drawn in yellow to indicate the area being defined, pressing ACTION a second time causes the drawing to stop. The current grid reference is displayed in the Ref2 field. The rectangle currently displayed is the user selected area. This mechanism is called 'rubber banding'.

The pointer is not allowed to cross the boundary representing the different grid systems.

5.5.6 Feedback

Having selected an area by successfully completing the Grid, Name or Box operations the system displays the smallest area map held on disc which totally encompasses the user's area. This area is displayed as a cyan coloured rectangle on the UK map.

The outline of the user's area remains on the screen, the last used area outline also remains if there was one.

At this point three rectangles may be shown over the UK map:

the last used area (in blue),
the user specified area (in yellow), and
the smallest system area which totally encompasses the user's area (in cyan).

5.5.7 Enter

Having successfully reached the feedback stage the user may adopt one of the rectangles displayed as the area for future use by using the pointer. The pointer is

placed over the required rectangle and ACTION is pressed, this causes that rectangle to be completely filled. The colour used for the fill is the same as the colour of the outline. If a conflict exists because of overlapping rectangles then the smallest rectangle is filled. The outlines of rectangles within the filled area are redrawn to show they still exist for selection. The larger rectangle can always be filled by moving out of the conflicting area. Only one rectangle can be filled at any one time, ie selecting another to be filled causes the last to be returned to an outline.

Pressing ACTION causes the currently filled rectangle to be adopted as the desired area.

If the desired area is stored as a background map it is fetched from the disc and displayed, the menu bar becomes:

< Help Main Reselect

Selecting Reselect causes the Area operation to be restarted at the top level to choose another area.

If the user is currently running an unforced area operation then selecting Main will return the user to the top level of the Area operation. The menu bar is:

< Help Explore ----- Contents Find

If the user is executing a forced area operation then Main will cause the Overlay operation which caused the forced operation to become active again and the Map Overlay display (see section 5.7) will be presented immediately.

5.5.8 Clear

If CHANGE is pressed then the currently filled rectangle is cleared from the screen. If CHANGE is pressed without a filled rectangle then no action is taken.

5.6 The Explore Item Selection Operation

5.6.1 Introduction

The Explore operation is a sophisticated use of the Walk display technique which allows the user to walk around a gallery representing the disc contents. At each level

of the contents the user is presented with a number of paths. 'Walking' down a particular path moves the user into the next level of the structure and more alternative paths are presented. At the end of this maze the data items are presented and the user can specify one of the items for further examination. At this point the relevant display technique is invoked.

Like other walks the path representations are each photographs displayed direct from the video disc.

5.6.2 Operation

The initial menu bar presented on entering the Explore operation is basically the same as that of the Walk display technique but with the Plan command replaced by the Top command (the option of selecting the Top command is only available if the user is not at the top of the gallery):

< Help Main < move Back > move

When not at the top of the gallery the menu bar is:

< Help Main < move Back > move Top

The options to move left, right or back are only displayed in the menu bar if the move is possible.

The user begins at the top of what seems like a gallery, this is called level 1 of the exploration. Four doors are shown at this level which lead down to four different areas. These areas are marked 'Society', 'The Economy', 'Culture' and 'The Environment' and correspond to the first level of the disc contents thesarus hierarchy.

The user may explore in any direction using the three move commands on the menu bar and the forward move, turn left and turn right from the display area as described in section 5.12 on the Walk technique.

The cursor key implementations of move forward, turn left and turn right (also described in section 5.12) are also available.

As the user reaches the end of that corridor (eg

cycle to next

Culture) a room is presented, decorated in appropriate and distinctive style and colours. The room is shown to have a number of further doors. Each of these doors is labelled with the thesarus entries for a topic available at this level (eg Arts, Beliefs, Consumption, Customs, etc). One of the doors is always labelled 'Exit', selecting this path causes the user to return to the next level back (eg in this case that would be the top level).

When level 2 of the thesarus is reached each corridor representing a topic includes an icon in the form a picture of a VDU displaying text as well as the label. Selecting this icon, by moving the pointer over it and pressing ACTION, will cause the node essay for this topic to be displayed. See section 3.3.3 for a description of how to page through the text.

As the user progresses through the thesarus levels, the bottom level is reached and items themselves are shown. Each item is represented by an icon appropriate to its data type.

Selecting the ^{item} icon will cause the data for that item to be displayed. If it is overlay data then the Area operation will be automatically invoked if no area has been selected.

The f7 & f8 function keys (labelled Next and Previous) are disabled during this operation.

At the bottom level the user enters a large room. Data items are represented by a photograph. The user may move about and/or rotate in the room to examine the contents. Data types with common characteristics are grouped together in the same part of the room and distinguished from other parts of the room by using dramatic changes in decor.

The Explore landscape exactly follows the structure of the thesarus. The thesarus allows upto 20 topics at any one level. However the Explore landscape at levels 2 to 4 inclusive can provide only 8 choices of path, 7 really as one is always the path 'Exit'. This problem is solved by providing dumbbell shaped rooms allowing more than 8 doors where necessary.

5.6.3 Top

Selecting Top causes the system to return to level 1 of the explore operation with the following menu bar:

< Help Main < move Back > move

The level 1 display is shown in the display area. The user may now recommence the walk, investigating a different topic if desired.

5.6.4 Main

Selecting Main exits the exploration and places the user at the top level of the Explore Operation with the following menu bar:

< Help [Explore] Area Contents Find

At this point the user may specify Contents, Find or Area to invoke that operation, selecting Explore restarts the exploration at level 1.

5.7 The Mappable Data Display Operation

5.7.1 Introduction

The Mappable data display option is used to generate digital maps of spatial data. If there is a background map then there will be a video underlay.

For example, this technique would be used to display the 'Housing Density of Dover' over a base map showing the Dover area.

The functions available within this operation are summarised in Figure 5.3.

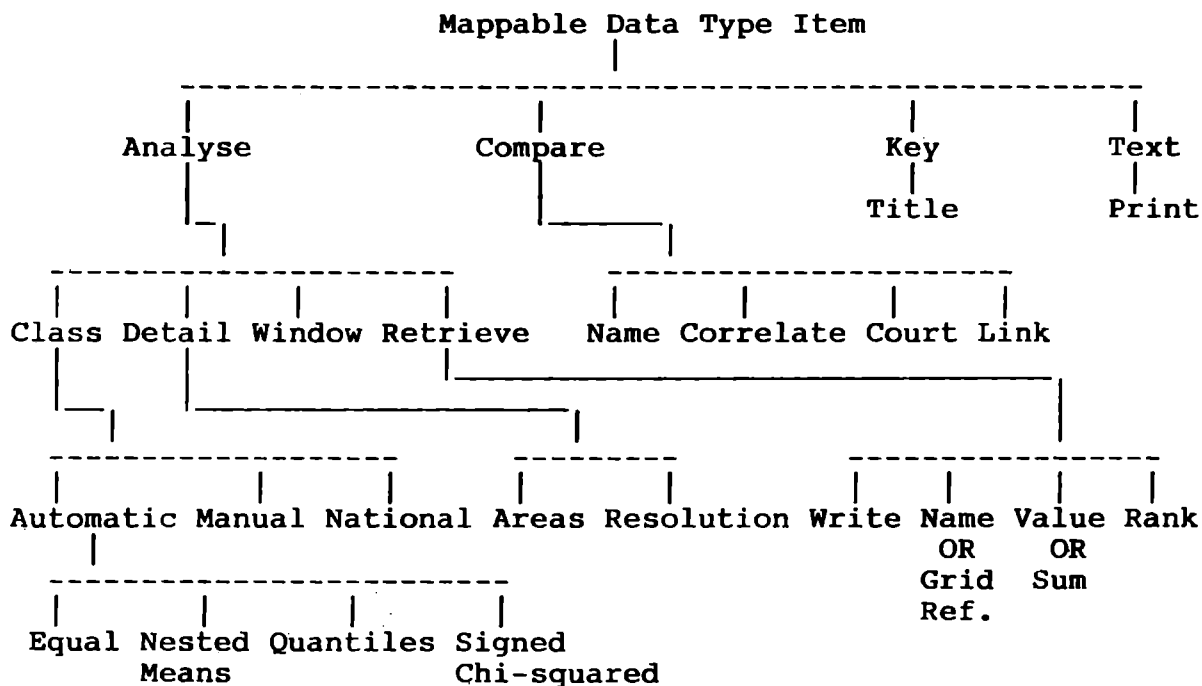


Figure 5.3 - Mappable Data Display Options

5.7.2 Operation

By the time this operation is reached the user has specified a data item of mappable type and the area of interest to be mapped.

This operation uses a coarser screen mode making it impossible to use the same icon to represent the pointer. For this operation a different icon is used for the pointer which is less distinct due to the screen resolution but as similar to the normal pointer as is possible.

The message 'Loading data' is displayed in the message area, as the data is loaded from the disc and formatted.

At the end of loading the message is cleared and if the current area of interest is held as a video background map it is displayed.

The menu bar displayed initially is:

< Help Main Analyse Compare Key Text

The variable is then displayed in the form of coloured squares (like coloured squares will merge together to form non square areas) representing values within up to six categories. The class intervals are calculated using the stored data values for the complete area covered by the variable (not just the area of interest).

The six colours used for the classes default to (in order): blue, cyan, green, yellow, magenta and red. The colour black (actually transparent, and therefore appearing as grey) represents 'no data'.

The item name is displayed in the message area at the top of the screen.

For the Mappable operation the micro output is overlaid in a transparent mode. The default initial display is in transparent mode to show the background map if it exists. This can be overridden by the user by pressing CHANGE. The transparent mode can be reactivated by repeating the action. If no background map then just get black background.

5.7.3 Text

Selecting Text presents the user with a sequence of text pages describing the data set. These may actually consist of up to 3 distinct essays chained together beginning with the most particular and ending with the most general. This is achieved by invoking the Essay data display operation described in section 5.10. The menu bar becomes:

< Help Main Print

5.7.4 Print

When print is selected, the screen display of text is printed as described in section 3.4.1. The Menu bar whilst printing is:

< Help Main Quit

Selecting Quit stops printing and gives the menu bar:

< Help Main Analyse Compare Key Print

5.7.5 Key

Selecting Key from the menu bar causes the item name to be replaced by a display in the message area showing the 'key' to the main display. The menu bar becomes:

< Help Main Analyse Compare Title Text

The message area display consists of seven blocks of colour in the order black (really grey), blue, cyan, green, yellow, magenta and red across the screen.

Each box contains a number (up to 5 characters of the redefined mode 2 character set, displayed in a colour which is the complement of the colour of the box and so can always be seen) showing the maximum number represented by that colour. The first box contains 'NA' to indicate no data, these characters are held as a special icon which only occupies 1 character position on the screen. The second box precedes its number with '<' to indicate the class covers all values less than the number in the box. This box is 1 character space wider than the rest and in this way the accompanying value in the second box can be a full 5 characters. The last box contains '>' to indicate that this class covers all values greater than the immediately preceding box.

Negative numbers are shown with a leading '-' and can only be up to 4 character spaces long.

If the values are too small or too large to be shown in the box then the system will swap to scientific notation. In scientific notation the number 100,000 is represented as 1.00E5 to mean 1.00 times 10 to the power 5.

Selecting Title causes the item name to be redisplayed in the message area and the menu bar changed back.

5.7.6 Analyse Map displays

Selecting Analyse from the Mappable data display operation main menu allows the user to examine the currently displayed map more closely. The menu bar becomes:

< Help Main Class Detail Window Retrieve

Selecting Main exits the Analyse sub operation and returns the user to the top level of the Mappable data display operation with the menu bar:

< Help Main Analyse Compare Key Text

5.7.7 Window

Selecting Window allows the user to clear away all the partly displayed areal units around the edge of the screen up to the boundary of the first whole areal unit. This is achieved by blanking (by displaying in black and hence transparent) out the partly displayed units. The menu bar becomes:

< Help Main Class Detail ----- Retrieve

The message area is unchanged.

5.7.8 Detail

Selecting Detail from the menu bar allows the user to vary the detail of the mappable data shown on the screen. The user may choose to change the resolution of the raster being used or to change the areal units being plotted. The menu bar becomes:

< Help Main Resolution Areas
OR

The Areas option to change the areal unit is only offered on the menu bar for areal unit data sets. It is also possible that no alternative areal units exist in which case the Areas option will not be shown on the map.

The main display and the message area are left unchanged.

5.7.9 Resolution

Selecting Resolution causes the menu bar to become:

< Help Main Replot Areas
OR

The main display is unchanged.

The message area shows the grid squares or raster resolutions available for selection, for grid square data the prompt an example is:

Grids available: 1 2 3 4 5 6 7 8 9 10 km

For areal unit data the prompt an example is:

Rastor size: 1 2 3 4 5 6 7 8 9 10 km

All text is shown in cyan except for the resolution currently being used which is shown in blue.

An alternative resolution can be chosen by placing the pointer on the desired number and pressing CHANGE. This will cause it to be shown in yellow.

Selecting Replot from the menu bar causes the mappable data to be redisplayed using the newly specified resolution.

If it is impossible to plot the mappable data at the selected resolution then the message:

Resolution too fine

is displayed in the message area, see section 3.3.5, it is replaced by the grid or rastor selections.

Selecting Main exits the Resolution sub operation without change and returns the user to the Detail function with the menu bar:

```
<  Help  Main  Resolution  Areas
                                OR
                                -----
```

5.7.10 Areas

Selecting Areas causes the menu bar to become:

```
<  Help  Main  Resolution  Replot
```

The main display remains unchanged.

The message area shows the currently used areal unit and is available for selection:

Areal unit: District

The prompt is shown in cyan and the areal unit currently being used is shown in blue.

An alternative areal unit can be chosen by placing the pointer on the current areal unit name in the message area and pressing CHANGE. This will cause the name to

change to the next areal unit available from the list and is shown in yellow. In this way all the areal units can be scrolled through for selection. The areal unit list is displayed in resolution order from the coarsest to the finest. The finest entry will be 'Grid Square' which will have with it a default resolution, the Resolution function can be used to change this value. Once the desired areal unit is being displayed in the message area it is selected by choosing the Replot option from the menu bar.

Selecting Replot from the menu bar causes the mappable data to be redisplayed using the newly specified areal unit. A new raster size will also be calculated and used if necessary.

If it is impossible for the system to plot the map at the selected resolution then the message:

Area selected too small for resolution

is displayed in the message area, see section 3.3.5, it is replaced by the currently displayed areal unit name.

Selecting Main exits the Areas sub operation and returns the user to the Detail function with the menu bar:

< Help Main Resolution Areas

Selecting Main again from this menu bar exits Detail function and returns the user to the Draw function with the menu bar:

< Help Main Class Detail Window Key

5.7.11 Class

Selecting Class allows the user to respecify the class intervals, this may be done manually (by entering new numbers directly) or automatically (by specifying an algorithm to calculate the new classes). The menu bar becomes:

< Help Main Automatic Manual National

Selecting Main again from this menu bar exits the Class function and returns the user to the Analyse function with the menu bar:

< Help Main Class Detail Window Retrieve

Selecting National from the Class menu bar causes only the data within the current area of interest to be considered when calculating new class intervals using the automatic techniques, the menu bar becomes:

< Help Main Automatic Manual Local

Selecting Local from this menu bar causes the data for the complete country to be considered once again for classing and the menu bar reverts to:

< Help Main Automatic Manual National

5.7.12 Manual selection of Class Intervals

Selecting Manual causes the menu bar to become:

< Help Main Automatic Replot National

The message area contains the same display as that for the key procedure, that is, a row of coloured boxes containing numbers indicating the class intervals.

The main display is unchanged.

This facility allows the user to change the class intervals represented by the 6 main colours and to swap the colours around.

Placing the pointer on a coloured box and pressing CHANGE causes the colour to change. Press it again and the colour changes again, in this way all the 6 colours as well as black and white are rotated for selection.

When ACTION is pressed a flashing cursor replaces the pointer under the first number in the box. The user may enter a new number of up to 5 characters for positive numbers or up to 4 characters for negative numbers (scientific notation allowed) and press ACTION.

The pointer may be moved to the next box to recalibrate it.

Selecting Replot from the menu bar causes the map to be redisplayed using the newly specified class intervals and colours.

If the new class intervals are inconsistent then the message:

Inconsistent Class Intervals

is displayed in the message area. See section 3.3.5 on error messages, the manual class display is reshown in the message area.

Selecting Main exits the Manual sub operation and returns the user to the Class function with the menu bar:

< Help Main Automatic Manual National

A special case of class appears when the variable is already categorised, for example the 20 classes of land cover. Here the user can use the manual classing system to choose which 6 of the 20 primary categories to display, or of grouping the 20 into 6 groups. For this case the boxes contain numbers indicating the highest number category included in that colour. These may be edited as described above. Selecting black for a class causes it to be suppressed from the display.

For these categorical data types (as well as data stored as means or percentages) the analytic functions Sum and Radius are not appropriate and are suppressed. The Values function is allowed for these data types.

5.7.13 Automatic selection of Class Intervals

Selecting Automatic causes the menu bar to become:

< Help Main Equal Nested Quantiles Chi Squared

Selecting Main exits the Automatic sub operation and returns the user to the Class function with the menu bar:

< Help Main Automatic Manual National

If during one of these automatic techniques the system discovers that there is not enough data with different values to allow the classing over the full six classes then some classes will be left empty and the map drawn as normal.

5.7.14 Equal

Selecting Equal causes the class intervals to be recalculated by finding the highest and lowest values within the data set (the data set is defined by the current National/Local selection) and defining the classes as being equal splits between these numbers. The key is redrawn showing these newly calculated values as the limits of each class and the menu bar becomes:

< Help Main Replot Nested Quantiles Chi Squared

Selecting Replot from the menu bar causes the map to be redisplayed using the newly calculated class intervals, the menu bar becomes:

< Help Main Equal Nested Quantiles Chi Squared

Selecting Main exits the automatic class interval function and returns the user to the class function with the menu bar:

< Help Main Automatic Manual National

5.7.15 Nested Means

The nested means method produces four classes by calculating the following three cut off points: the mean of the distribution over the area of interest, the mean of the values below the distribution mean and the mean of the values above the distribution mean.

The four colours used to show the nested mean classes are (in order): cyan, green, yellow and red. It is only these four colours which are shown in the key.

The key is redrawn showing these newly calculated values as the limits of each class and the menu bar becomes:

< Help Main Equal Replot Quantiles Chi Squared

Selecting Replot from the menu bar causes the map to be redisplayed using the newly calculated class intervals, the menu bar becomes:

< Help Main Equal Nested Quantiles Chi Squared

Selecting Main exits the automatic class interval function and returns the user to the class function with the menu bar:

< Help Main Automatic Manual National

5.7.16 Quantiles

Selecting Quantiles causes the class interval cut off values to be calculated such that an approximately equal number of areal units (grid squares for grid square data) are included in each of the classes.

The key is redrawn showing these newly calculated values as the limits of each class and the menu bar becomes:

< Help Main Equal Nested Replot Chi Squared

Selecting Replot from the menu bar causes the map to be redisplayed using the newly calculated class intervals, the menu bar becomes:

< Help Main Equal Nested Quantiles Chi Squared

Selecting Main exits the automatic class interval function and returns the user to the class function with the menu bar:

< Help Main Automatic Manual National

5.7.17 Signed Chi Squared

This measure provides a partial solution to the problem of extreme ratios occurring in areas of small base populations, swamping the more significant changes in larger areas.

This technique first transforms the data set by weighting the ratios by the base population. An expected value is obtained by multiplying the data average and the base population. The transformed data value is found by dividing the square of the difference between observed and expected values by the expected value.

The class interval cut off values are then calculated using the Equal technique (described above) on the transformed data set. Once found the cut off values are retransformed back to the corresponding values relative to the original data set for display in the key. The values will almost certainly appear very non linear.

The key is redrawn showing these newly calculated values as the limits of each class and the menu bar becomes:

< Help Main Equal Nested Quantiles Replot

Selecting Replot from the menu bar causes the map to be redisplayed using the newly calculated class intervals, the menu bar becomes:

< Help Main Equal Nested Quantiles Chi Squared

Selecting Main exits the automatic class interval function and returns the user to the class function with the menu bar:

< Help Main Automatic Manual National

5.7.18 Retrieve

Selecting Retrieve from the Analyse operation allows the user to retrieve data from the currently displayed map, it causes the following menu bar:

< Help Main Write Rank Name Values
 OR OR
 Grid Ref. Sum

Which of the two sets of menu bar is displayed is dependent on the type of the current data item. That is, if the data item is of the grid square type then Grid and Sum are shown in the menu bar otherwise (for areal unit data) Name and Values are shown.

The message area and main display are unchanged.

Selecting Main exits the Retrieve procedure and redisplay the Analyse menu bar:

< Help Main Class Detail Window Retrieve

If when Retrieve was invoked the message area showed the key then it is redisplayed when Main selected. If the title was being shown it is reshown.

For categorical data types and data stored as means or percentages the analytic function Sum is not appropriate and are suppressed, the Values function is allowed.

5.7.19 Rank

The menu bar becomes:

< Help Main Top

The Top option is only shown when viewing any page other than the first for a multi page list.

At this stage Mode 1 is reengaged so the list display is more acceptable.

Selecting Rank produces a ranked list of the variable by

the areal units currently shown on the screen. This function is not available for grid square data.

This is displayed in the main screen area and follows the same techniques as showing other lists. A two line format is used for each entry in the list. On the first line is the item number of up to four digits beginning at 1, space, and the areal unit name of up to 30 characters. The format used for the second line is, five spaces, the value for the areal unit (up to 5 characters, right justified, may be in scientific notation), three spaces, the percentage down the list (up to 3 characters eg 55%), three spaces, the cumulative total (up to 8 characters, right justified, may be in scientific notation), three spaces, and the percentage this area is of the grand total. A typical screen looks like:

Ranked list of <variable name> by <areal unit>

	Value	% Down List	Cumulative Total	% of Grand Total
1	Kent 2340	0%	2340	34%
2	Sussex 2339	5%	4679	30%
3	Surrey 2338	10%	7017	26%
4	Hampshire 98	35%	7115	2%

Cyan is used throughout for the text. All text is left justified within its field. Non of the text is proportionall spaced. The heading is displayed in the message area and is seperated from the list by a single blank line.

The areal vector of the map being displayed is saved before Rank is invoked so it may be easily redisplayed at exit time.

Selecting Main exits the Rank procedure and causes the mappable data to be redisplayed and the menu bar to become:

<	Help	Main	Write	Rank	Name	Value
					OR	OR

Grid Ref. Sum

Selecting Top redisplay the first page of the ranked areal unit list. If less than a page of areal units exist then the Top prompt does not appear in the menu bar.

If the areal unit list is too long to sort (because of time and/or memory limits) then only the maximum and minimum areal units and their values are found and displayed. The main display instead of showing the list just shows the following:

The list of Areal Units is too long to sort

Maximum value and Areal Unit name:

2340 Kent

Minimum value and Areal Unit name:

98 Hampshire

All text is in cyan and is left justified within its field. The item numbers at the beginning of the data lines are replaced by spaces. Each line is seperated by a single blank line. The menu bar does not include the Top option.

5.7.20 Name or Grid Reference

The menu bar becomes:

```
<  Help  Main  Write  Rank  Clear  Values
                                OR
                                Sum
```

If Name is selected from the menu bar and the pointer is placed within the area and ACTION pressed then the name of the areal unit selected is displayed left justified in the message area.

If Grid Reference is selected from the menu bar and the pointer is placed in the area and ACTION is pressed then the grid reference of the square indicated by the pointer is displayed in the message area. Both the all numbers format and the letters-and-numberss format are shown as described in section 4.4.3.

Selecting Clear causes the message area to be reset, the key is redisplayed, any white coloured squares are returned to their original colour, and the menu bar is left unchanged.

Selecting Main closes down the Retrieve sub operation and the menu bar becomes:

< Help Main Class Detail Window Retrieve

5.7.21 Sum

Selecting Sum causes the menu bar to become:

< Help Main Write Rank Grid Ref Clear

The sum procedure allows the numerical value of one or the sum of a group of squares on the map to be displayed.

Whilst in the Sum operation selecting a square of the map by pressing ACTION makes that square turn white and causes the value of that square to be shown left justified in the message area.

If a subsequent square is selected then the cumulative total is shown in the message area.

Selecting a square by pressing CHANGE makes that square flash, moving the pointer and pressing ACTION causes all squares in a horizontal line between the two points to be white filled. The cumulative sum is calculated and updated in the message area. If the pointer is moved any where other than horizontally and ACTION pressed the currently flashing square changed to white and just its value added to the total.

Selecting Clear causes the message area to be reset, the key is redisplayed, any white coloured squares are returned to their original colour, and the menu bar is left unchanged.

If the data set being displayed has a unit associated with it then this is displayed in the message area with the values. The units are held on the disc with the data. If the value and units will not fit in one line then as much of the units as will fit is shown.

Selecting Main closes down the Retrieve sub operation and the menu bar becomes:

< Help Main Write Rank Grid Ref Sum

5.7.22 Values

Selecting Values causes the menu bar to become:

< Help Main Write Rank Name Clear

The values procedure allows the numerical value of one of the areal units on the map to be displayed.

Whilst in the Values operation selecting a square of the map by pressing ACTION makes that square turn white and causes the value of the areal unit enclosing that square to be shown left justified in the message area.

If a subsequent square is selected then its value is shown in the message area.

Selecting Clear causes the message area to be reset, the key is redisplayed, any white coloured squares are returned to their original colour, and the menu bar is left unchanged.

If the data set being displayed has a unit associated with it then this is displayed in the message area with the values. The units are held on the disc with the data. If the value and units will not fit in one line then as much of the units as will fit is shown.

Selecting Main closes down the Retrieve sub operation and the menu bar becomes:

< Help Main Class Detail Window Retrieve

5.7.23 Write

When Write is selected, the data corresponding to the current Map display is written to the floppy disc drive as described in section 3.4.2. Like when printing the menu bar entry changes to Quit in order to stop writing.

5.7.24 Compare Mappable datasets

Selecting Compare allows the user to compare different variables over the currently selected area of interest. The menu bar becomes:

< Help Main Name Correlate Court Link

Correlate is not offered as an option on the menu bar if the number of areal units on display is less than 5.

If Correlate or Court are selected and there are more areal units/grid squares displayed than can be sorted due to memory and/or time restrictions the message:

Too much detail to correlate

is displayed in the message area, see section 3.3.5 on error messages.

Selecting Main exits the Compare maps sub operation and returns the user the top level of the Mappable data display operation with the menu bar:

< Help Main Analyse Compare Key Text

5.7.25 Name

The menu bar becomes:

< Help Main ---- Correlate Court Link

Selecting Name allows the user to easily compare the map patterns of two variables, the prompt:

Name:

appears left justified in the message area, the main display area is left unchanged. The user may now enter the item name to specify the second variable to map.

If the variable name specified is 'Bookmark' then the data currently stored in the bookmark is used.

If the data item specified exists and is of the correct type (ie Mappable data item) all the other parameters of the Mappable data display operation are left as previously set (the area of interest, the areal unit and the resolution) and the new display is generated. If the data item selected does not exist for the currently selected areal units or resolution then its defaults are

calculated and used. The default class intervals for the new variable are always used to overwrite the class intervals of the last displayed variable.

Even if the Mappable data display operation is exited then the current area of interest, areal unit and resolution are stored and used on subsequent data items, if possible.

If the data item specified does not exist the message:

Unknown data item name

is displayed in the message area. If the data item specified exists but is not of Mappable data type the message:

Inappropriate data item

is displayed in the message area. See section 3.3.5 on error messages, the prompt is redisplayed.

If the required data item name is not known then the normal item selection operations may be invoked after selecting Main to exit the Compare sub operation and Main a second time to exit the Mappable data display operation.

Selecting Main exits the Name sub operation and returns the user to the Compare maps operation. The menu bar becomes:

```
<  Help  Main  Name  Correlate  Court  Link
```

5.7.26 Correlate

This technique calculates a value for the degree of correlation between two data sets, it takes no account of the current setting of the class intervals for the variables. The menu bar becomes:

```
<  Help  Main  Name  ----  Court  Link
```

If this option is selected the prompt:

Name:

appears left justified in the message area, the main display area is left unchanged. The user may now enter the item name to specify a second variable.

If the variable name specified is 'Bookmark' then the

data currently stored in the bookmark is used.

The correlation between the currently displayed data and the newly specified variable is calculated. Only those areal units/grid squares within the area of interest are considered.

If the data item specified does not exist the message:

Unknown data item name

is displayed in the message area. If the data item specified exists but is not of Mappable data type the message:

Inappropriate data item

is displayed in the message area. See section 3.3.5 on error messages. The prompt is redisplayed.

If the required data item name is not known then the normal item selection operations may be invoked. First select Main to exit Correlate, select Main again to exit the Compare sub operation and Main again to exit the Mappable data display operation.

Spearman's rank correlation value is computed and is shown in the message area together with the standard error calculated and the number of areas in the correlation in the following format:

Correlation: Error: Areas:

The main display area remains unchanged.

Selecting Main exits the Correlate sub operation and returns the user to the Compare maps operation. The message area redisplayes the key and the menu bar becomes:

< Help Main Name Correlate Court Link

5.7.27 Court

Instead of comparing data values, this technique compares the map patterns as mapped (after the data values have been categorised into class intervals) and yields a measure of the map pattern correlation. The Court method is used in this case. The menu bar becomes:

< Help Main Name Correlate Value Link

If this option is selected the prompt:

Name:

appears left justified in the message area, the main display area is left unchanged. The user may now enter the item name to specify a second variable.

If the variable name specified is 'Bookmark' then the data currently stored in the bookmark is used.

If the data item specified does not exist the message:

Unknown data item name

is displayed in the message area. If the data item specified exists but is not of Mappable data type the message:

Inappropriate data item

is displayed in the message area. See section 3.3.5 on error messages. The prompt is redisplayed.

This technique can only be applied if the two variables can be mapped for the same areal units, if this is not the case the message:

Inappropriate area type for data item

is displayed in the message area.

If the second variable has been fetched from the video disc it is categorised according to its default class intervals. If the variable has been fetched from the bookmark then the class intervals stored in the bookmark are used.

The two map patterns are compared and a new map is drawn on the screen indicating the degree of map pattern similarity obtained.

The middle value for each variable is calculated from the categorised map patterns, each areal unit is then assigned one of four values and hence a colour:

Strong positive (red) - both map patterns are greater than their middle value,

Weak positive (yellow) - the original variable is

greater than its middle value and the new variable is less than or equal to its middle value,

Weak negative (cyan) - the original variable is less than or equal to its middle value and the new variable is greater than its middle value, or

Strong negative (blue) - both map patterns are less than or equal to their middle values.

Each areal unit is plotted on the main display in the colour corresponding to the degree of similarity.

The message area shows the four colour key in the order: red, yellow, cyan and blue. The corresponding labels shown are: 'Strong +ve', 'Weak +ve', 'Weak -ve' and 'Strong -ve'.

If Value is selected from the menu bar the map correlation value computed is shown in the message area following the prompt:

Map Correlation value:

and the menu bar becomes:

< Help Main Name Correlate Key Link

Selecting Main exits the Court sub operation and returns the user to the Compare maps operation. The message area redisplayes the key and the menu bar becomes:

< Help Main Name Correlate Court Link

5.7.28 Link

The menu bar becomes:

< Help Main Name Correlate Court -----

Selecting link causes the prompt:

Name:

to be displayed left justified in the message area, the main display area is left unchanged. The user may now enter the item name of a second variable using the keyboard and press ACTION.

If the variable name specified is 'Bookmark' then the data currently stored in the bookmark is used.

If this variable is of the appropriate type (an incidence data set of Mappable data type) then the system adds the first variable to the second (using AND-plotting with the screen memory) and displays the total value only if both variable values are present.

This presents a display where all co-incident squares are shown in red and the rest of the screen is black (transparent).

Incident data sets are always mapped using the colour red to indicate the presence of data.

The message area shows the two colour key in black and red with the labels: 'No data' and 'Coincident data' respectively.

If the data item specified does not exist the message:

Unknown data item name

is displayed in the message area. If the data item specified exists but is not an incidence set of Mappable data type the message:

Inappropriate data item

is displayed in the message area. See section 3.3.5 on error messages and the prompt is redisplayed.

The current data set and the data held in the bookmark do not have to be incidence data sets. In this way non incidence data sets may be converted (so the class of interest is shown in Red), optionally stored in the Bookmark, and compared with other incidence data sets.

If the required data item name is not known then the normal item selection operations may be invoked. First select Main to exit the Link sub operation, Main again to exit the Compare sub operation and Main again to exit the Mappable data display operation.

5.8 The Chart Data Display Operation

5.8.1 Introduction

This display technique is used to pictorially represent the sets of numerical data stored on the National disc. For example a bar chart may be used to illustrate the change in sales of various national newspapers over a period of time and how these changes compare from

newspaper to newspaper. Or a Pie chart may be used to represent the relative sales figures for the top selling home computers in the UK.

The functions available within this technique are summarised in Figure 5.4. All these functions are not available in every case.

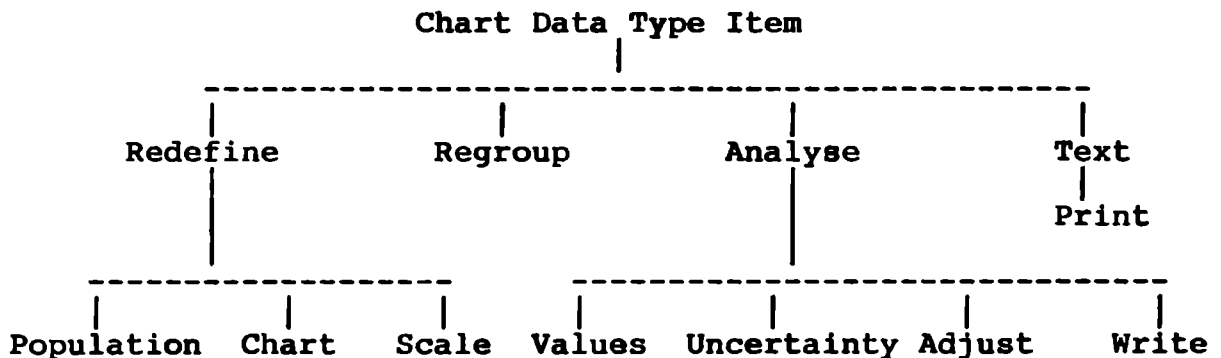


Figure 5.4 - Chart Data Display Options

Each data-set of CHART type is arranged as a multi-dimensional array of values. Each dimension of the array corresponds to one of the classifying variables in the data set and is divided into a set of class intervals. Each element or cell of the array is defined as the intersection of one class interval from each classifying variable.

Two types of classifying variable are distinguished: dependent classifying variables and independent classifying variables. There is, at most, ONE dependent classifying variable for each data set. It is the dependent classifying variable which provides the breakdown which makes the data set meaningful in terms of the topic it relates to. For example a data set on "Attitudes to the EEC in 1985" might have as dependent variable "Attitudes" with categories "In favour", "Not in favour" and "No opinion". Independent classifying variables are things such as "Sex" and "Age group" which are not vital to the sense of the data set, but which can provide further breakdowns which may be of interest.

There is a single value stored in each element which represents the value of the data set for that particular combination of class intervals on the classifying variables.

If cells contains count values then the data set is additive and can be manipulated in very flexible ways. If cells do not contain counts (contain precomputed percentages or mean values) the data is non-additive and a more limited set of manipulations are available.

For non-additive CHART-type data sets some classifying variables may also include an extra class interval denoted by "ALL". This has absolutely no implication for any handling of the data set. It simply means that the original compilers of the set need to remember that the value recorded for "ALL" values of one the classifying variables needs to represent an accumulation across all the other class intervals of the variable. In data sets of additive data there is no need for any such "ALL" categories to be explicitly included by the data set compilers since such accumulations can be calculated by the system at the time of processing.

The data stored in the data set may represent different things, for example a data set may contain the average heights and weights of people classified by age group, social class, sex and region. In such a data set, referred to as a "topic" set, the categories of the dependent classifying variable correspond to the various topics. Such a data set is non-additive.

The CHART option of the Domesday system allows the data stored in the data set to be charted in various ways against either ONE of the classifying variables or simultaneously against TWO of the classifying variables in the data set. The User interface section of the CHART option, therefore deals primarily with the selection by the user of a primary and possibly a secondary classifying variable.

When first retrieved, each data set is presented to the user in a default chart-type, charted against ONE pre-ordained primary classifying variable. These defaults are supplied to the system as part of the data set header. Initial defaults will also apply to all the other classifying variables and these will be fixed for every variable by the system as "ALL" (for non-additive sets) or summed across the variable's class intervals (for additive sets).

The screen displaying each chart contains several elements:

The chart itself, consisting of an x-y axis, labelled with self-scaled increments along the y-axis and labels or single-character abbreviations denoting the class

intervals of the default primary classifying variable. These axes will be appropriately labelled with the title of the data set and keys to show the full description of each class interval of the variable.

The variable key which reports the status of each variable in the set. The name of each variable will be listed with the "active" classifying variable used on the chart highlighted. For all other classifying variables a caption will display the current class interval of that variable used to define the underlying reference population drawn from the data set. Initially the default will be for all these inactive variables to show "ALL" indicating that the reference population is currently the whole of the data set.

The chart key which lists all other types of chart which may be used to display the current data set also appears on the screen with the currently used method highlighted.

The total set of possible charts are: a simple bar chart, a back-to-back bar chart, a stacked bar chart, an adjusted back-to-toback bar chart, an adjusted stacked bar chart, looping simple bar charts, a pie chart, a time series line graph and a scattergram.

5.8.2 Simple Bar Chart

A simple bar-chart in which the x-axis bears a set of vertical bars, each the same width and corresponding to one class interval of the classifying variable selected for the x-axis. For non additive data sets the height of each bar represents the value of the data set at the intersection of the class interval corresponding to this bar on the primary (x-axis) classifying variable and the currently displayed class intervals of all the other classifying variables. For additive data sets the height of each bar is calculated as the percentage of the bar in relation to the sum of all the bars for the classifying variable.

5.8.3 Back-to-back Bar Chart

A back-to-back bar chart in which each single bar of the simple bar chart above is replaced by a set of mini-bars, with each mini-bar in the set corresponding to the class intervals along a SECONDARY classifying variable. For non additive data sets the heights of all the mini-bars again represent the values stored in the data set. For additive data sets the height of each mini bar is the percentage of the mini bar in relation

to the sum of all the bars for both classifying variables.

5.8.4 Stacked Bar Chart

A stacked bar-chart which is logically similar to the back-to-back chart except that instead of displaying the mini-bars side by side, they are drawn one on top of another to form a single composite bar. The height of each segment of the bar is calculated in the same way as for the mini-bars of the back-to-back bar charts.

5.8.5 Adjusted Back-to-back Bar Chart

An adjusted version of the back-to-back bar-chart in which the height of a bar in a group of mini-bars is calculated as the percentage of the total for all the mini-bars for that category of the secondary classifying variable.

5.8.6 Adjusted Stacked Bar Chart

An adjusted version of the stacked bar-chart in which the y-axis is converted to a simple 0-100% scale and each of the segmented bars along the x-axis is stretched to fill the whole range, with the heights of the individual segments are calculated as a percentage of the total for all segments for that category of the primary classifying variable.

5.8.7 Looping Simple Bar Charts

A looping bar-chart is an animated series of simple bar-charts shown at approximately 10-second intervals and automatically changing via animation to reflect serially all the class intervals of a secondary classifying variable.

5.8.8 Pie Chart

A pie chart is available for additive data sets only and is in effect a simple bar-chart in which all the bars along the x-axis are represented as sectors of a circle in which the sum of all the bars amounts to 360 degrees. This chart is incomprehensible for more than 12 sectors.

5.8.9 Time Series Line Graph

A time series line graph is only possible for non-additive time series data where "Time" is specified as the dependent classifying variable. If "Time" is used

as the primary x-axis classifying variable a time series line graph may be drawn. If in addition a secondary x-axis classifying variable is specified such a graph may be drawn with multiple lines.

5.8.10 Scattergram

A scatter-gram is based on any two lines plotted on a line-graph. A scattergram plots incremental changes (the change over each time increment on the x-axis of the original line graph) in the first selected line of the time series line graph against the corresponding incremental changes in the second selected line.

5.8.11 Operation

The default display is normally a simple bar chart, this can be redrawn for various reference populations. The user may redefine the x-axis classifying variable, this will produce a new barchart which can again be redrawn for various reference populations.

The user may go on to specify, in addition, a secondary x-axis classifying variable. This is used to produce back-to-back, stacked and looping barcharts. The categories of the primary x-axis classifying variable provide the labels on the x-axis and the categories of the secondary x-axis classifying variable provide the labels for the keys in the stacked and back-to-back barcharts. In the context of the looping barchart display it is the categories of the secondary x-axis classifying variable that are cycled through.

Other options that may be selected are examining the uncertainty associated with the results, displaying the value of each bar etc and the regrouping of the categories of a variable.

When first invoked the Chart operation shows the selected data in its default format in the display area. If a dependent classifying variable is not specified then the first listed independent variable will be used for the breakdown in the initial display. The menu bar is:

< Help Main Redefine Regroup Analyse Text

5.8.12 Main

Selecting Main exits the Chart operation and returns the user to the last major operation to choose another item to be examined.

5.8.13 Text

Selecting Text presents the user with a sequence of text pages describing the data set. These may actually consist of up to 3 distinct essays chained together beginning with the most particular and ending with the most general. This is achieved by invoking the Essay data display technique described in section 5.10.

The menu bar becomes:

< Help Main Print

5.8.14 Print

When Print is selected, the screen display is printed as described in section 3.4.1, whilst printing the menu bar becomes:

< Help Main Quit

Selecting Quit stops printing and restores the menu bar to the one above.

5.8.15 Analyse

Selecting Analyse causes the menu bar to change to (the main display is not changed):

< Help Main Values Uncertainty Adjust Write

5.8.16 Values

Selecting Values from this menu bar allows the user to examine the value of each section of the chart display. This is achieved by placing the pointer on the section of the chart of interest (for example a particular bar of a barchart) and pressing ACTION. The value of that bar is then shown in the message area. The line under the display title indicates if the data is sample (with size) or census data. During this sub operation the menu bar becomes:

< Help Main ----- Uncertainty Adjust Write

5.8.17 Uncertainty

This option is only available for samples which have been chosen by some randomisation method. It is not available for quota samples and does not appear in the menu bar for such a data set. It may also not be possible for certain non-additive data sets.

This option is also limited to 2D bar charts (including looping ones) and back-to-back bar charts (adjusted and unadjusted). If any other form of display is in use when Uncertainty is selected the message:

Inappropriate Chart Type

is displayed in the message area. See section 3.3.5 on error messages.

If the option is chosen for a valid chart display then vertical arrows appear in the display straddling the top of the bar. The arrows are shown in a colour different from the colour of the bar so that they can always be seen. These arrows indicate the 90% confidence interval for the height of the bar. If the highest is calculated to be more than 100% then 100% is used, if the lowest is calculated to be less than zero then zero is used. Whilst showing the arrows the menu bar becomes:

< Help Main Values Clear Adjust Write

Selecting Clear causes the original chart to be replotted.

5.8.18 Adjust

The adjust option is not available for non-additive data sets. Only for the back-to-back and stacked bar chart types is the Adjust option available. If any other form of display is in use when Adjust is selected the message:

Inappropriate Chart Type

is displayed in the message area. See section 3.3.5 on error messages.

Normally (for an unadjusted display) the percentages represented up the y-axis are the percentages in the various subgroups.

If the adjust option is selected then for back-to-back bar charts the largest bar of each grouping is made equal to 100% and the height of the other bars in the group adjusted accordingly. For stacked bar charts all the bars are of the same height and represent 100%, the values for each segment of the bar are recalculated accordingly. The percentages represented are the percentage in each of the response subgroups. That is the bar chart has been adjusted for the different numbers in the subgroups of the secondary classifying variable for the back-to-back, and the primary variable for stacked.

Replotting is automatically done as part of the Adjust operation.

Whilst an adjusted display is being shown the menu bar is:

< Help Main Values Uncertainty Unadjust Write

5.8.19 Write

When Write is selected, the data corresponding to the current Chart display is written to the floppy disc drive as described in section 3.4.2. Like when printing the menu bar entry changes to Quit in order to stop the process.

5.8.20 Redefine

The user may redefine the data being displayed or the form of the display or both. The menu bar becomes:

< Help Main Replot Regroup Analyse Text

The main display area is divided into two sections. The left section (columns 1-30) contains the actual chart display and the right section (columns 31-40) contains the Variable and Chart keys. The Variable key lists the variables for the data set. The Chart key lists the chart displays available to display the data set. The Chart key has the heading 'Chart Types'. All the text is in cyan except the variable and chart type used to produce the chart display currently on the screen which are shown in blue to highlight them.

Examples of this display are shown in Appendix A1.

Selecting Redefine means that the right section of the screen is now available for the selection of other variables and chart types.

Selecting Redefine also means that the y-axis may be rescaled by placing the pointer on the y-axis label and pressing ACTION. The replotting is automatic.

5.8.21 Changing the Reference Population

The user now has a number of options to choose from. S/he can change the primary x-axis classifying variable by placing the pointer on the desired variable within the variable key and pressing CHANGE. The chosen variable is highlighted by changing the text to yellow in colour. The user can choose a secondary variable by specifying a second variable from the key in the same way.

Each variable in the key is separated by a single line. This line, immediately below the variable name, is used to show the current groupings of the variable. The group names are shown indented by 1 character position to make the key easier to read.

Only the first 10 characters of the variable name are shown in the key to save space on the screen. If a variable name has been truncated the full name may be examined by placing the pointer on the name and pressing ACTION, this causes the full name to be shown in the message area. The group names are similarly truncated to 9 characters, the full group name may be examined in the same way.

The groups of the variable currently plotted are not shown in the key as they appear on the x axis of the main chart display. That line in the key is left blank.

If the grouping entry for a variable is 'ALL' this indicates that all the categories of the variable are currently included in the reference population. The 'ALL' category is used as the default.

If the user wishes to restrict the reference population this is achieved by placing the pointer on the group field of the variable to be restricted (which causes it to be shown in yellow) and pressing CHANGE. This causes the next group name to be displayed in its place on the group line and shown in yellow. Pressing CHANGE again causes the next group name to be shown, in this way all the groupings can be examined. When the desired

group name is displayed selecting Replot from the menu bar causes the chart to be redrawn with the new reference population.

The Replot operation resets the old display selection indicators from blue back to cyan and changes the new selections from yellow to blue.

For independent variables the subgroup 'ALL' may be reselected in the same way to return the chart to its original form. For dependent variables no 'ALL' subgroup exists and the first subgroup is used as the default. The regrouping facility may be used for dependent variables to provide an 'ALL' like group. Regroup may also be used to change the names of groups.

5.8.22 Alternative Character Set

In order to reduce the chopping of variable and group names to a minimum a smaller alternative character set is defined for use on the chart displays.

5.8.23 Changing the Chart Display

Only the chart types appropriate to the data set are shown in the Chart key.

If only a primary x-axis classifying variable has been specified the choice of display types is restricted to a two dimensional bar chart and pie chart for additive data sets. If the dependent variable is "Time" and this is also the current primary x-axis classifying variable a time series graph is an extra option. If the data is non-additive the pie chart is not an option. The two dimensional bar chart is the default.

If a secondary x-axis variable has also been specified then back-to-back, stacked and looping bar charts are available for additive data sets. Stacked is not available for non-additive data sets. If the dependent variable is "Time" and this is also the current primary x-axis classifying variable multiple time series graphs and scattergrams are also available. The back-to-back is the default. If the user sets a second variable (where previously there wasn't one) then the chart type options immediately change from 2D bar, pie chart or line graph to the other five. If the second variable is deselected then the change back is effected. The default is always adopted at replot time if no other is selected.

The looping display causes the system to automatically scroll through the categories of the chosen secondary x-axis classifying variable displaying the appropriate 2D bar chart for each category. This is similar to the user manually changing the reference population with two differences; firstly since the y-axis scale is fixed the change from one bar chart to the next is animated (with a 10 second delay at each presentation) and the scrolling is automatic.

The scattergram can only be produced based on 2 lines of a line graph. So before selecting Scattergram the 2 lines of interest must be selected from the key at the bottom of the screen.

If no lines have been selected from the key and the Scattergram option is selected then the message:

Select any two lines from the key

is displayed in the message area. See section 3.3.5 on error messages.

Lines are selected from the key by placing the pointer (causing the text to change to yellow) and pressing ACTION (causing the text to change to blue).

If only 2 lines exist on the line graph then these are used automatically.

If only 1 line exists on the line graph then the scattergram option is not offered in the Chart key.

5.8.24 Replot

Selecting Replot causes the chart to be replotted with the new variable and chart type settings if changed. The menu bar becomes:

< Help Main Redefine Regroup Analyse Text

Wherever possible the chart display is changed by animation rather than clearing the screen and redrawing the complete chart. For bar chart displays this is presented as growing or shrinking bars on the chart for variable changes. The display changes one bar at a time moving left to right across the screen. This is not possible when a chart type change has been requested (for example pie chart to bar chart). It is possible for changes from a simple bar chart to a stacked bar chart, or a change from a simple bar chart to a back-to-back bar chart.

If the chart is being replotted using animation techniques then the y-axis is not rescaled in order to show the differences between the old and new charts. If a bar becomes too large for the current y-axis scaling then it is shown with a pointed top to indicate it continues off the display. The user can choose to rescale the y-axis by selecting Redefine from the menu bar, placing the pointer over the y-axis label and pressing CHANGE.

If the new chart cannot be drawn because it will not fit on the screen as there are now more than 24 bars on the bar chart or more than 4 lines on the time series graph then the message:

Too many groups to plot - Please Regroup

is shown in the message area. See section 3.3.5 on error messages.

When replotting the display the colour of each section of the chart is alternated to show the different sections of the chart. The dataset also specifies the three colours to be used for the chart display together with any patterns to be applied to the bars. The colour cycling is restarted at the beginning of each group of bars on the bar chart to aid comparison of groups of bars.

As any chart is drawn calculations are made regarding the validity of each section. These calculations relate to the sample size and the number of missing survey returns. If the calculations fall below the acceptable threshold the chart is still plotted but the message:

Unreliable Estimates

is displayed in the message area.

If an adjusted stacked or back-to-back bar chart is being plotted then the error message is expanded to:

Unreliable Estimates for: <Category Name>

For adjusted back-to-back bar charts the category name will be filled in as the offending category of the secondary variable. For adjusted stacked bar charts the offending category of the primary variable is filled in.

If the full category name will not fit on the screen then as much as will fit is shown.

If at chart plotting time it is discovered that the full group names will not fit across the x axis of the display then the single character abbreviations are used. If no abbreviation exists then the system assigns them beginning at 'A' and progressing through the alphabet.

The first abbreviation and its corresponding full name (eg A = Scottish Highlands) appears in a single line key at the bottom of the screen.

Selecting the abbreviation by placing the pointer on it (causing it to be shown in yellow) and pressing CHANGE will cause the next abbreviation and its full name to be displayed. In this way all the abbreviations may be examined.

5.8.25 Regroup

Selecting Regroup from the menu bar allows the user the facility for regrouping the categories of a variable. This option is not available for non-additive data sets and is suppressed from the menu bar. Neither is this option available for line graphs or scattergrams. If either of these displays is in use when Regroup is selected the message:

Inappropriate Chart Type

is displayed in the message area. See section 3.3.5 on error messages.

If the Regroup selection is successful the main display is unchanged and the menu bar becomes:

< Help Main Replot

The variable to be regrouped is selected by placing the pointer on the entry in the variable key on the right hand side of the screen (causing it to be changed to yellow) and pressing ACTION. The variable name remains shown in yellow whilst its regrouping is in progress.

The chart area on the left hand side of the screen (character columns 1 to 30 inclusive) then shows the current groupings for the selected variable in a list down the screen. If any groups have previously been omitted the prompt:

Select groups to re-include

appears above the group list (seperated by a blank line). The list is arranged on the line as follows:

<Group No.>	<2 spaces>	<Group Abbreviation>	<2 spaces>	<Group Name>
2 chars.	1 char.	1 char.	1 char.	Up to 30 chars.

The special combined group is shown last in the list and is given the group number 'C' in the display.

Each group is seperated by a blank line. If more than a screen full is presented then the user may page forwards and backwards in the standard manner as described in section 3.3.3 (Note that in order to move to the next page the user must ensure that the pointer is not placed on a group entry), the heading is shown on each page. All text is in cyan except those groups currently omitted which are in blue and the group name is left justified in its field.

At this stage the menu bar becomes:

< Help Main Replot Continue

A group to be re-included is selected by placing the pointer on the entry in the list (causing the group number to be shown in yellow) and pressing ACTION (causing the entire entry to be shown in cyan). This may be repeated for as many entries in the list as are currently omitted.

When all the desired groups have been changed, which may be none, then the user selects Continue from the menu bar to go on to the next stage.

The group list now reconfigures to show the contents of each group and the prompt:

Select Category to regroup

appears at the top of the screen. The reconfigured group list is now of the format:

<Group No.>	<3 spaces>	<Category Name>
2 chars.	3 chars.	Up to 30 chars.

If more than one category is included in a group then then each name is shown on subsequent lines. Each group is seperated by a blank line and more than one screen full is allowed.

The user moves the pointer over the category to be

regrouped in the list (causing the category name to be highlighted in yellow) and presses ACTION.

The prompt at the top of the screen changes to:

Select destination group

The group list remains unchanged. The user moves the pointer over the group number of the desired destination group (causing it to be highlighted in yellow) and presses ACTION.

This causes the group list to be redisplayed with the selected category moved into the selected destination group. The combined group cannot be selected as the destination group as the contents of each of the currently included groups are automatically included in the combined group. The contents of omitted groups are not shown in the combined group.

Further if a group includes more than one category then these categories are shown on consecutive lines in the combined group linked together by a vertical line up the list. For example if the categories Very Common and fairly Common are in the same group the combined group would look like:

```
      :  
      :  
C | Very Common  
  | Fairly Common  
  | Not Very Common  
  | Don't Know  
      :  
      :
```

The prompt:

Select Category to regroup

is shown again and the process is then repeated if another category is to be moved. When they have all been done selecting Continue from the menu bar causes the group list to revert back to displaying the abbreviation and group name fields and the prompt:

Select groups to be omitted

The group list remains unchanged. The user places the pointer over the entry to be omitted (causing the group number to be highlighted in yellow) and pressing

ACTION. This causes the selected entry to be shown in blue to indicate it has been omitted..

When all the desired groups have been changed, which may be none, then selecting Continue from the menu bar causes the prompt:

Enter new group names and abbreviations

Each area on the screen where a response may be entered is shown with a solid dark blue rectangle, text is in yellow. Moving the pointer into each area causes it to change to cyan, text is shown in blue as it is entered.

The user may now place the pointer in the group name and abbreviation fields (causing a flashing cursor to appear) and enter new text if desired.

When the new names and abbreviations have been entered selecting Continue from the menu bar takes the user back to the initial display of the Regroup operation.

If another variable is selected the regroup process is repeated.

If no other variables are to be regrouped then Replot may be selected to redraw the chart display with the new groupings.

Selecting Main from the menu bar in this case returns the user to the first display of the regroup operation. At this point another variable may be selected for regrouping.

The number of subgroups displayed always corresponds to the number of original category levels for the variable, no matter what grouping has taken place.

If whilst regrouping the user tries to limit the classifying variable to having only one level then the error message:

Cannot have less than 2 groups

is displayed in the message area, see section 3.3.5 on error messages.

5.9 The Plan Data Display Operation

5.9.1 Introduction

The Plan display technique shows information which is a single photograph. These photographs typically include a map in the display as an important part of the information. A map of the UK showing all the National Parks is an example of this form of display.

The functions available are summarised in Figure 5.5.

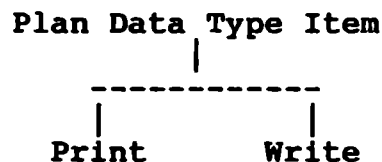


Figure 5.5 - Plan Data Display Options

5.9.2 Operation

When an item of data type 'plan' is selected, the Plan operation is entered. The initial photograph for the item is displayed. This shows a map-like image containing one or more icons; this is termed the 'main map'. Each icon is a yellow filled rectangle in the video image. The menu bar is as follows:

< Help Main

If the pointer is moved over one of the icons and ACTION pressed, a textual description of the area relating to the icon is shown on the screen superimposed over a photograph. The photograph occupies the left hand side of the screen and the text is displayed on the right hand side. The essay operation is used to show the text. The menu bar becomes:

< Help Main Plan Print Write

5.9.3 Plan

Selecting Plan returns the user to the main plan photograph from a text description. The Plan option is not shown on the menu bar when the main plan photograph is being displayed.

5.9.4 Print

When Print is selected, the screen display is printed as described in section 3.4.1.

5.9.5 Write

When Write is selected, the screen display is written to the floppy disc drive as described in section 3.4.2.

5.10 The Essay Data Display Operation

5.10.1 Introduction

This display technique is used throughout the system to present information held as text to the user, this may include photographs of tables and diagrams, these are accessed by selecting a figure.

Essays on the National disc may also include photograph sequences, a Photo-essay. For these essays fetching the next page to view may mean displaying a photograph, fetching a subsequent page could be another photograph or revert back to text.

The options available within this section are shown in Figure 5.6.

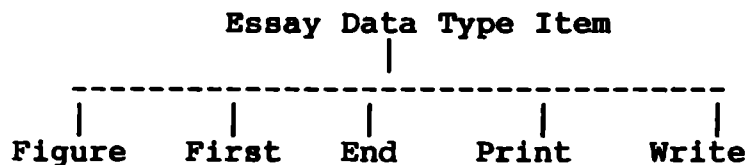


Figure 5.6 - Essay Data Display Options

5.10.2 Operation

The menu bar reads as follows:

< Help Main First End Print Write

Essays are presented in exactly the same way as on the Community Disc except for displaying figures and the possibility of Photo-essays.

5.10.3 Figures

Essays included on the National disc are allowed to contain references to figures, this is not allowed for essays on the Community disc.

A Figure may in fact be an entire photo set, see section 5.11 for a description of that technique. Selecting main in the photo set returns the user to the essay.

The figure references are of fixed format enclosed in square brackets:

[see Fig. <figure number>]

for example: [see Fig. 3]

Only one figure may be referenced in each set of square brackets.

These figures may be selected for display by using the pointer.

The user can look at the illustration by placing the pointer over the figure reference (within the square brackets) and pressing ACTION.

This causes the Photo Set display operation to be invoked to display the photograph depicting the requested figure. Selecting Main within Photo Set returns the user to the Essay operation at the point at which s/he left off.

5.10.4 Print

When Print is selected, the screen display is printed as described in section 3.4.1.

5.10.5 Write

When Write is selected, the screen display is written to the floppy disc drive as described in section 3.4.2.

5.10.6 First

Selecting First from the menu bar returns the user to the top of the essay and redisplay the first page. When displaying the first page the First option is not shown on the menu bar.

5.10.7 End

Selecting End from the menu bar takes the user to the end of the essay and displays the last page. When displaying the last page the End option is not shown on the menu bar.

5.10.8 Main

Selecting Main from the menu bar closes down the Essay display operation and returns the user to the calling process.

5.11 The Photo Set Data Display Operation

5.11.1 Introduction

This technique is used to display information held on the disc as one or more photographs.

This operation is the same as the operation for the Community disc which displays picture sets with the addition of the Index function.

The functions of this operation are described in Figure 5.7.



Figure 5.7 - Photo Data Display Options

5.11.2 Operation

On entering the Photo Set operation the title photograph is shown in the display area and the menu bar shows:

< Help Main Index

Selecting Main from the menu bar closes down the operation and returns to the last major operation. The user may then choose another item for examination.

The Index option is only available in the menu bar if there are less than or equal to 100 pictures in the set to be displayed. If more than 100 pictures exist then

the first photograph of the set is shown (instead of showing the index). The following menu bar is shown:

< Help Main Description Clear Print

If the Index option is available then the menu bar whilst viewing a photograph is:

< Help Main Description Clear Print Index

This operation is identical to the Community disc and is fully described in section 4.5.

5.11.3 Index

As described above for this sub operation the menu bar is:

< Help Main

This function is only supported for picture sets of less than or equal to 100 pictures.

Selecting Main from the menu bar closes down the operation and returns the user from the Photo Set operation to the last major operation. The user may then choose another item for examination.

Selecting Index whilst viewing a photograph returns the user from anywhere in the picture set to a display of an index of the pictures available.

The index itemises the photographs by number in photograph order. Each photograph is described by its caption (not its description).

The photograph numbers are left justified in the display area and the captions begin at column 6 to allow for photograph numbers up to 9999 followed by a space. The default colour used for the text is cyan. An entry may be selected in the normal manner. That is, the pointer placed on an entry will cause the photograph number to be shown in yellow. The entry is selected by pressing ACTION which causes that photograph to be shown.

As described above the following menu bar is shown:

< Help Main Description Clear Print Index

Selecting Main from this menu bar exits the operation and returns the user to the last major operation.

5.11.4 Print

When Print is selected, the screen display is printed as described in section 3.4.1.

5.12 The Walk Data Display Operation

5.12.1 Introduction

This technique is a sophisticated way of viewing a coordinated set of photographs on a particular item. For example, a set of photographs showing the complete interior of a house may be examined by walking through them.

The sub operations within this display operation can be seen in Figure 5.8.

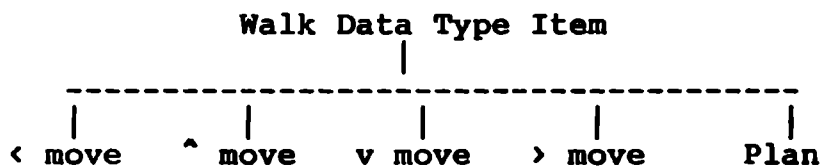


Figure 5.8 - Walk Data Display Options

5.12.2 Operation

When an item of data type 'walk' has been selected, the Walk operation is entered and the menu bar is as follows. The menu bar does not show the move forward (^Move), this move is achieved by placing the pointer in the centre third section of the display area and pressing ACTION. One or more of the 'move' options may be absent from the menu bar if a move in that direction is not possible. If the move forward is not possible and it is attempted then the photograph does not change and the message:

No move possible in this direction

is shown in the message area. See section 3.3.5 on error messages.

The full menu bar is:

< Help Main < Move Back > Move Plan

A title photograph is displayed which describes the walk (this is actually the first frame of the walk with text superimposed over the top). The user then imagines that s/he is in the physical area depicted by the walk and may move about this area in the following manner:

Whenever a move is made, a photograph is displayed which shows the scene viewed from the user's new position. The menu bar remains as shown above, except that a different selection of the 'move' options may now be included if the available views have changed.

A turn to the left of 45 degrees is accomplished by moving the screen pointer to the left hand third of the display area and pressing ACTION; a turn to the right of 45 degrees is accomplished by moving the screen pointer to the right hand third of the display area and pressing ACTION. These moves are available even if the menu bar is not currently displayed.

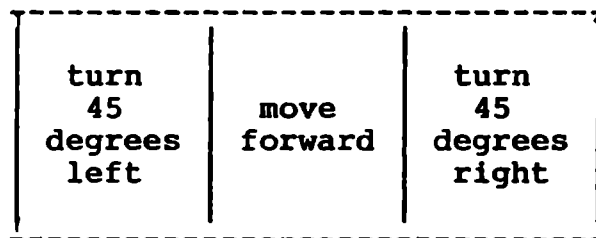


Figure 5.9 - Moves available from the display area

In addition to using the display area the following keys on the keyboard are available to move or turn:

Shift & Cursor Left key - Turn left by 45 degrees,
 Shift & Cursor Right key - Turn right by 45 degrees,
 Shift & Cursor Up key - Move forward, and
 Shift & Cursor Down key - Move back.

Some photographs contain one or more icons indicating the presence of close-up shots of objects near the icon. The icons are yellow magnifying glasses with drop shadow

20 pixels high. The sequence of close-up shots is entered by moving the screen pointer over an icon and pressing ACTION. The first close-up shot of the sequence is then displayed. Progression through the sequence is performed in the manner described in section 3.3.3. The menu bar becomes:

< Help Main

when the close-up sequence is exited by selecting Main, the Walk is re-entered at the point it was left from by selecting Main.

If Plan is selected from the menu bar, a photograph is displayed which shows a plan of the part of the area currently being viewed. The user's current position and direction are indicated by a blue arrow superimposed on the plan. The arrow is similar in shape to the pointer arrow and twice as large. The plan photograph is part of a set of photographs which show plans covering the entire area. The complete set may be viewed in the manner described in section 3.3.3.



The menu bar during the Plan operation is as follows:

< Help Main

If Main is selected, the Plan is exited and the Walk is re-entered at the point it was left.

5.13 The Film Display Operation

5.13.1 Introduction

This technique allows the user to view the 60 second films stored on the second side of the National Disc.

When a data item of this type is selected the index of all the available films (up to the maximum of 60) is read from the videodisc together with their start and end frame numbers, then the message:

Turn videodisc over for this item

is displayed in the message area. See section 3.3.5 on error messages.

If the user does not wish to turn the video disc over at

this time another item may be selected from the item list still being displayed.

If the system detects that the Film side of the video disc is now accessible the selected film is shown. The film cannot be interrupted once it has begun and no menu bar is shown.

At the completion of the film the index of all the available films is displayed to allow another selection whilst using this side of the video disc. The menu bar shown is:

< Help Main

The index itemises the films by number in the order in which they are stored on the video disc. Each film is described by its title (up to 30 characters).

The film numbers are left justified in the display area and the titles begin at column 4 to allow for film numbers up to 99 followed by a space. The default colour used for the text is cyan. An entry may be selected in the normal way. That is, the pointer placed on an entry will cause the film number to be shown in yellow. The entry is selected by pressing ACTION which causes the film to be shown. The three pages of film titles may be paged backward and forward in the standard manner as described in section 3.3.3. The heading:

Video sequences available

is shown at the top of each page of the index.

If another Film is selected then it is shown without prompting for video disc changing and the index is reshowed.

If Main from the menu bar is selected the message:

Turn videodisc over

is displayed in the message area. See section 3.3.5 on error messages.

If the system detects that the data side of the video disc is now accessible the film operation is exited and the user is returned to the last major operation.

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6. HELP FACILITIES

The facilities available in the Help operation are summarised in Figure 6.1.

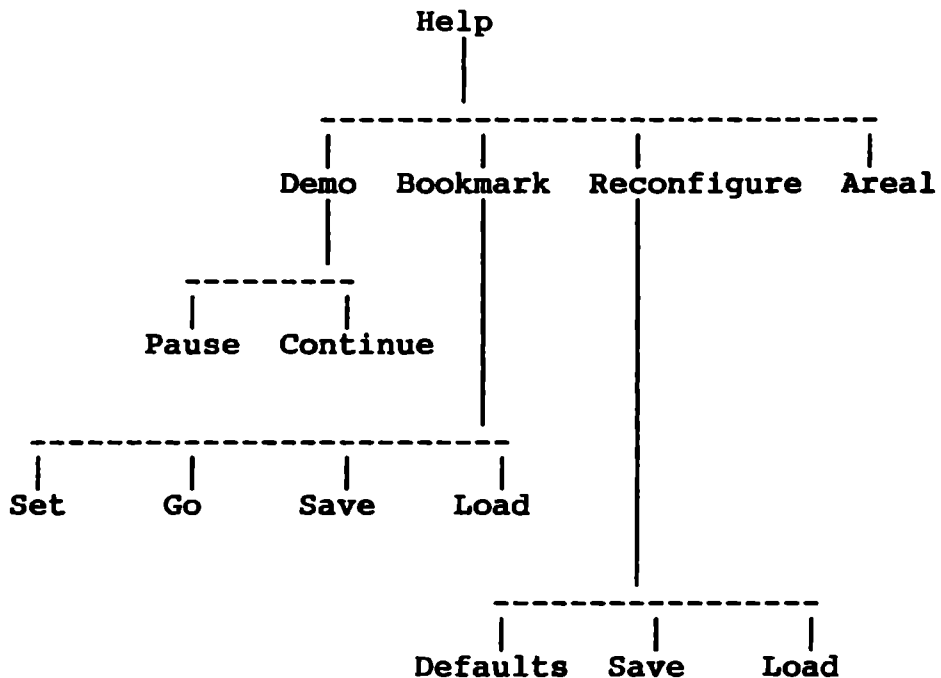


Figure 6.1 - Help Facilities

When the Help operation is entered, the current screen display is replaced by a status page and the menu bar reads as follows:

< **Exit Demo Bookmark Reconfigure Areal**

The Areal box is empty unless Help has been entered from the Overlay or Area operations on the National disc.

The status page contains the following information, displayed in cyan:

- Name of the currently mounted videodisc (**Community Disc or National Disc**)

- Number of the last frame read from the videodisc,

- Name of the item last accessed,
- Name of last two items Correlated, Courted or Linked in the Overlay operation on the National disc,
- Name of the gazetteer entry last accessed,
- The two grid references (of the bottom left-hand corner and the top right-hand corner) defining the current map; these are displayed in both digits and letters-and-digits format and to a resolution of 1km,
- Relating to the Overlay operation, the current area of interest, the current areal unit and the current resolution.

The format of the status page is defined in Appendix A1.15.

The user's current screen display and position in the system are saved until Exit is selected to leave the Help operation. Exit is available throughout Help and when it is selected the user's saved screen display and position are restored and normal operation of the system continues.

6.1 Help Text

With the status page displayed, the user can then page through the Help text in the manner described in section 3.3.3.

Help text has the same format as the photo essays (see section 5.10). It is divided into a number of articles, eg 'Help with the Overlay Function', 'How to Measure Distances'. Each article is displayed with its title at the top of every page and with the page numbering starting from 1 at the start of the article.

The order in which the Help articles are displayed depends on the user's position in the system when Help was selected. The first article displayed is specific to the precise operation the user is currently performing. Subsequent articles are more general. The number of articles available for display in any one Help session also depends on the user's position in the system, but there is always at least one article available.

6.2 Demo

When Demo is selected, the following menu bar is displayed:

< Exit Main Pause

A 30 second video and sound sequence is then displayed. There are a number of different sequences available for display; the one shown depends on what action was being performed just before Help was entered. The first 10 seconds of each video sequence are captioned **Sound sequence** in video. At the end of the sequence, the Help text is shown which was being displayed before the sequence started and the initial Help menu is shown.

Main immediately returns the user to the main Help operation at the previous position reached in the Help text.

Pause pauses the video sequence and causes the menu bar to become:

< Exit Main Continue

If Continue is selected, the sequence continues and the menu bar reverts to:

< Exit Main Pause

6.3 Bookmark

When Bookmark is selected, the following menu bar is displayed and a page of help text relating to the Bookmark operation is displayed in the display area.

< Exit Main Set Mark Go Mark Save Load

The Go Mark and Save boxes are empty if Set Mark or Load have not previously been selected.

Main returns the user to the main Help operation at the previous position reached in the Help text.

When Set Mark is selected, the user's current position in the system (before Help was selected) is saved as a 'bookmark'.

When Go Mark is selected, the Help facility is terminated and the system returns to the position stored in the bookmark.

When Save is selected, an attempt is made to write the current bookmark to the floppy disc device. The filename used is **DOMARK**. This name may be changed in the

Reconfigure operation (see section 6.4.5). The bookmark data is written in ASCII characters; the precise format is to be specified. If a file with this name already exists in the directory being written to, it is deleted and a new bookmark file is created.

When Load is selected, an attempt is made to read a bookmark from the floppy disc device. The bookmark is assumed to be in a file called **DOMARK** and in the specified format for a bookmark. The filename accessed may be changed in the Reconfigure operation (see section 6.4.5). If a bookmark is successfully loaded, it replaces the current bookmark, if there is one.

6.4 Reconfigure

When Reconfigure is selected, the following menu bar is displayed:

< Exit Main Defaults Save Load

The currently displayed page of Help text is cleared from the screen. The message:

CONFIGURATION SEQUENCE

is displayed in the message area.

In addition, the values currently held in the System Configuration Profile are shown in the display area. The format used for the display is shown in Appendix A1.16. In the format shown in the Appendix, single quotes surround areas where configuration data is displayed and can be modified by the user. The areas are shown as dark blue blocks on the actual screen display. When the screen pointer is moved into one of these blocks, its colour changes to cyan and changes can be made to the contents of the block by the user. Text outside the coloured blocks is cyan; text inside the blocks is yellow.

Sections 6.4.1 to 6.4.7 following describe how changes can be made to the configuration data once a block has been selected with the screen pointer. No changed values are applied to the System Configuration Profile until Main is selected (see section 6.4.8).

6.4.1 Display Colours

This facility allows the user to change the display colours used by the system, apart from those used in the Overlay operation, which can be changed in the Overlay

operation itself (see section 5.7.15). The three default colours are cyan, yellow and dark blue; the user is given the opportunity to change any of them to red, green, magenta or white provided that all three colours remain different. To cycle through the available colours, the user moves the pointer into the block containing the colour to be changed and presses ACTION1. Every time the button is pressed, the next colour in the colour sequence is displayed in the block.

6.4.2 Display Position

This facility allows the user to move the entire screen display by small increments horizontally or vertically on the display monitor. The default movements away from the start position are 0 pixels to the right and 0 pixels to the bottom. To change the amount of movement, the user places the pointer over the value to be changed and enters the required number of pixels movement. Negative numbers are entered for movements up and to the left.

6.4.3 Search Scope

This facility allows the user to change the parts of the database scanned by the Find operation on either disc. The parts scanned can be limited to any one of the following parts:

- photographic data (ie photographs on the Community disc and photosets and walks on the National disc),
- textual data (ie text on the Community disc and essays on the National disc),
- numeric data (ie overlay, chart and plan data on the National disc). If the numeric data option is selected, all data on the Community disc is scanned,
- all data. This option allows the user to revert back to scanning all data on both the Community and National discs.

To cycle through the types of data scanned, the user places the pointer over the Search Scope block and presses ACTION1. Every time the button is pressed, the next data type in the sequence is displayed in the block.

6.4.4 Proportional Spacing

This facility allows the user to switch off/on the use of proportional spacing for displayed text. When ACTION1 is pressed with the pointer over the block, 'on' changes to 'off' or 'off' changes to 'on'.

6.4.5 Floppy Disc Filenames

This facility allows the user to specify different filenames used for saving and restoring data to and from floppy discs. The three filenames which can be changed are:

- the filename used in the Write command, which can be performed from various places in the system and is described in section 3.4.2. Only the first three characters of the filename may be changed since the last four are used as a sequence number.
- the filename used in the Save and Load bookmark commands (see section 6.3).
- the filename used in the Save and Load configuration commands (see section 6.4.8).

To change a filename, the replacement name is typed with the pointer over the relevant block.

6.4.6 Operating System Command

Any command typed in this block is passed to the operating system of the microcomputer in its entirety.

6.4.7 Configuration Help

When ACTION1 is pressed with pointer over this block, help text is displayed for the Reconfigure function. While this help text is being displayed, the menu bar is:

< Exit Main

Selection of Main restores the previously displayed configuration data; selection of Exit exits the user from the Help function entirely.

6.4.8 Menu Bar Selections for Reconfigure

Main passes any changed configuration values to the system. At this point the new values are validated; any

erroneous input is reported in an appropriate error message. If there are no errors in the entered data, the new configuration values are installed in the System Configuration Profile and the user is returned to the main Help operation at the previous position reached in the Help text.

Defaults replaces the current values in the System Configuration Profile and on the screen display with those used when a cold start is performed.

When Save is selected, an attempt is made to write the current System Configuration Profile to the floppy disc device. The filename used is **DOMCON**. This name may be changed in the Reconfigure operation (see section 6.4.5). The configuration data is written in ASCII characters; the precise format is to be specified. If a file with this name already exists in the directory being written to, it is deleted and a new configuration file is created.

When Load is selected, an attempt is made to read a System Configuration Profile from the floppy disc device. The profile is assumed to be in a file called **DOMCON** and in the specified format for a profile. The filename accessed may be changed in the Reconfigure operation (see section 6.4.5). If a profile is successfully loaded, it replaces the current System Configuration Profile.

6.5 Areal

When Areal is selected, the menu bar changes to:

< **Exit** **Demo** **Bookmark** **Reconfigure** **Main**

The list of areal unit names and the areal unit type for each name is then displayed in cyan. It may be paged using the method described in section 3.3.3. The following title appears in the message bar:

AREAL UNIT LIST

Main returns the user to the main Help operation at the previous position reached in the Help text.

7. USER EXTENSIONS

Some parts of the system software can be replaced by the user; the parts affected are listed below.

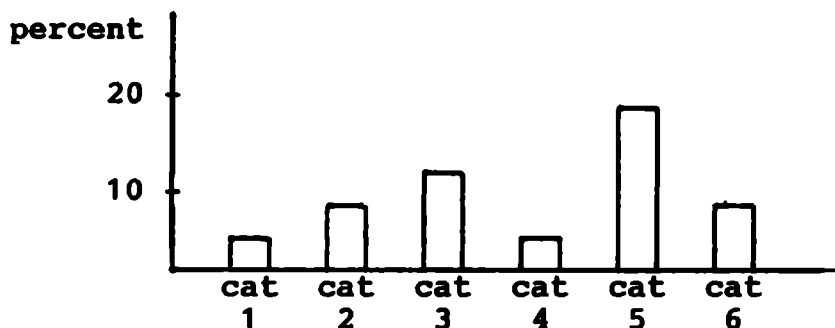
- Graphics driver routines, to facilitate the use of a different microcomputer operating system.
- The mouse driver, to facilitate the use of a different input device instead of the mouse (eg touchscreen).
- The microcomputer/videodisc player interface routine, to facilitate the replacement of the Domesday videodisc player with a combination of a standard videodisc player and a CD ROM drive.
- The routines which access the item names file, to facilitate the updating of the data for some items. The replacement item data would be read from floppy disc. No new items can be added however.
- The printer driver used in the Print operation, to facilitate the use of a different printer.
- The floppy disc driver used in the Write operation, to facilitate the use of a dump device other than the floppy disc drive.

The user performs these replacements by booting the Domesday system using his own software on floppy disc. This software is not part of this specification. It would perform all the necessary changes to the system tables to enable the new routines to be called and would contain the new routines themselves.

A1. Appendix A1 - Display Examples

A1.1 Two Dimensional Bar Chart (see section 5.8.1)

<data set title> by <primary classifying variable>
 (Sample Size = @@@@@@)



Variable 1

Variable 2

ALL

:

:

Variable m

ALL

Chart Types

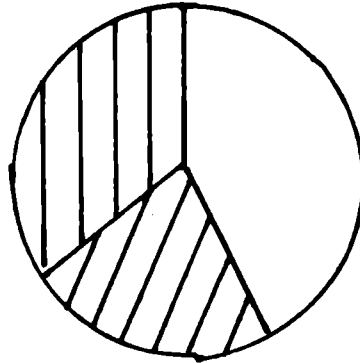
2D Bar Chart

Pie Chart

Notes: <data set title> indicates title shown here, same for primary classifying variable, @@@@@@ indicates sample size inserted here and cat 1 to cat 6 indicate the category labels for the data. The fields shown with an underline above are actually displayed in blue, all other text is in cyan.

A1.2 Pie Chart (see section 5.8.1)

Perception of Mugging Frequency by Social Class
(Sample Size = 300)



	Upper
	Middle
	Working

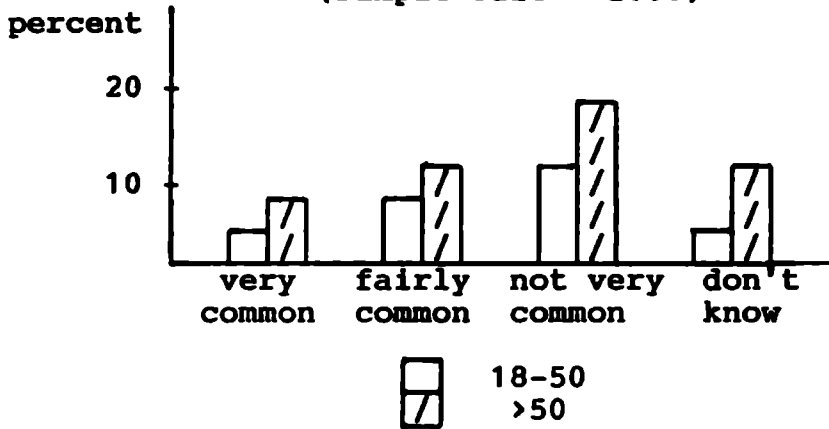
Response
Very Common
 Region
Scotland
 Age
ALL
Social Class

Chart Types
 2D Bar Chart
Pie Chart

Note: The Pie Chart key appears centre justified between the left hand edge of the screen and the Chart key at the bottom of the screen.

A1.3 Back-to-back Bar Chart (see section 5.8.1)

Perception of Mugging frequency by Response by Age
(Sample Size = 2000)

Response

Region

ALLAge

Social Class

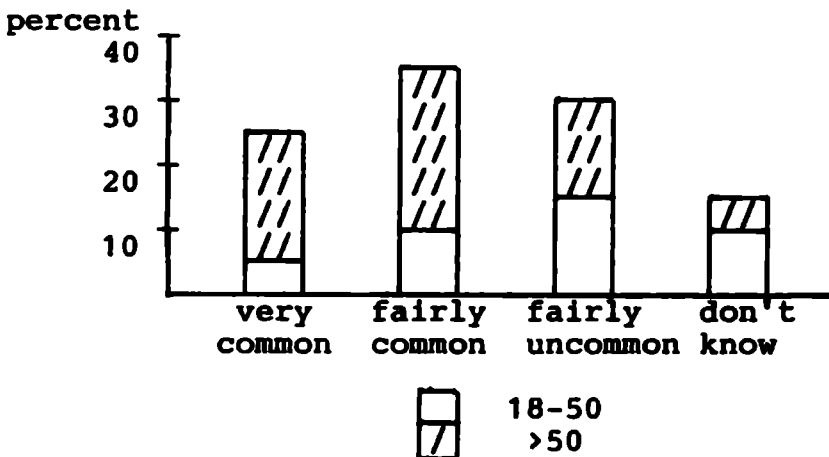
ALL

Chart Types

Back-to-backStackedLooping

A1.4 Stacked Bar Chart (see section 5.8.1)

Perception of Mugging frequency by Response by Age
(Sample Size = 2000)

Response

Region

ALLAge

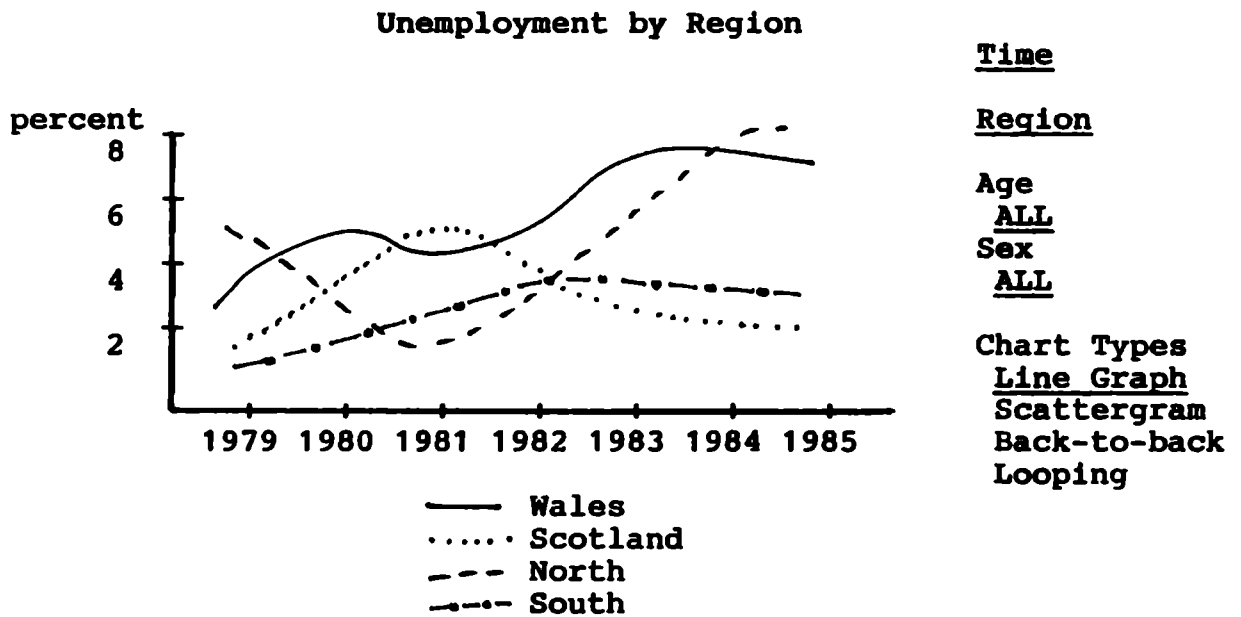
Social Class

ALL

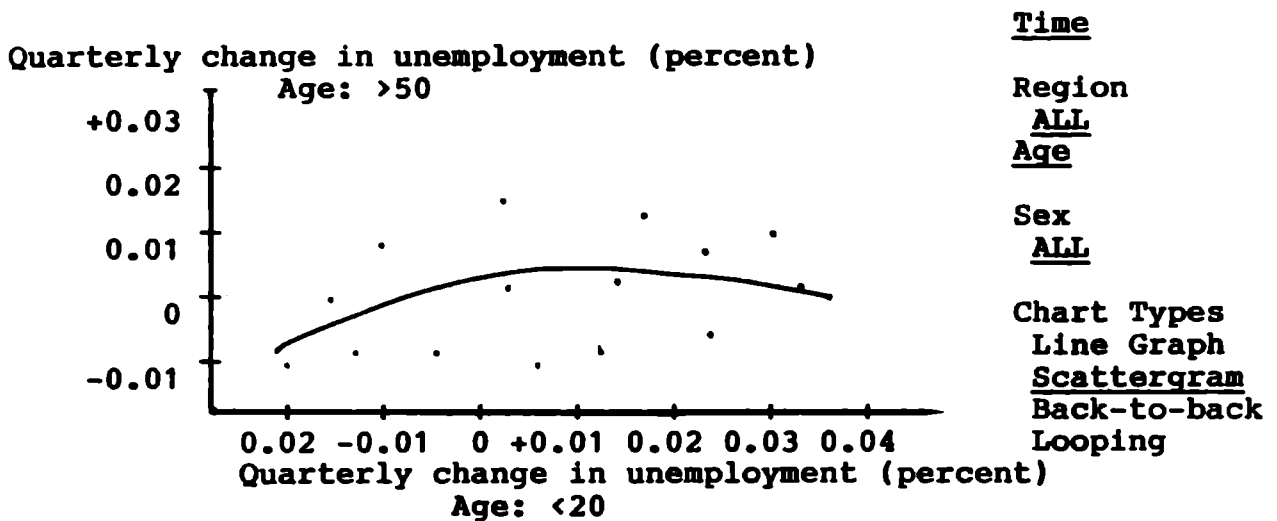
Chart Types

Back-to-backStackedLooping

A1.5 Line Graph (see section 5.8.1)

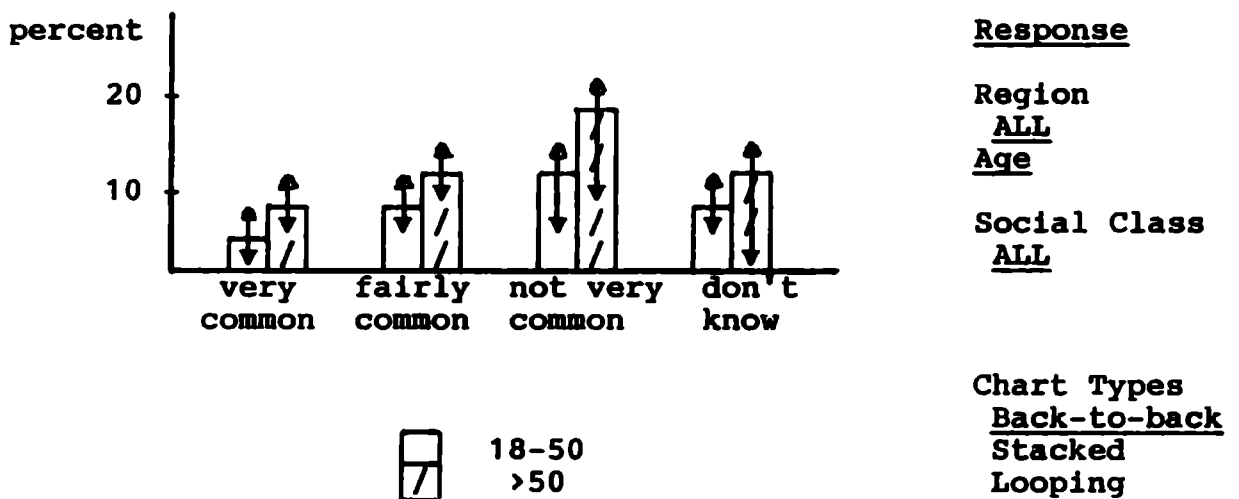


A1.6 Scattergram (see section 5.8.1)

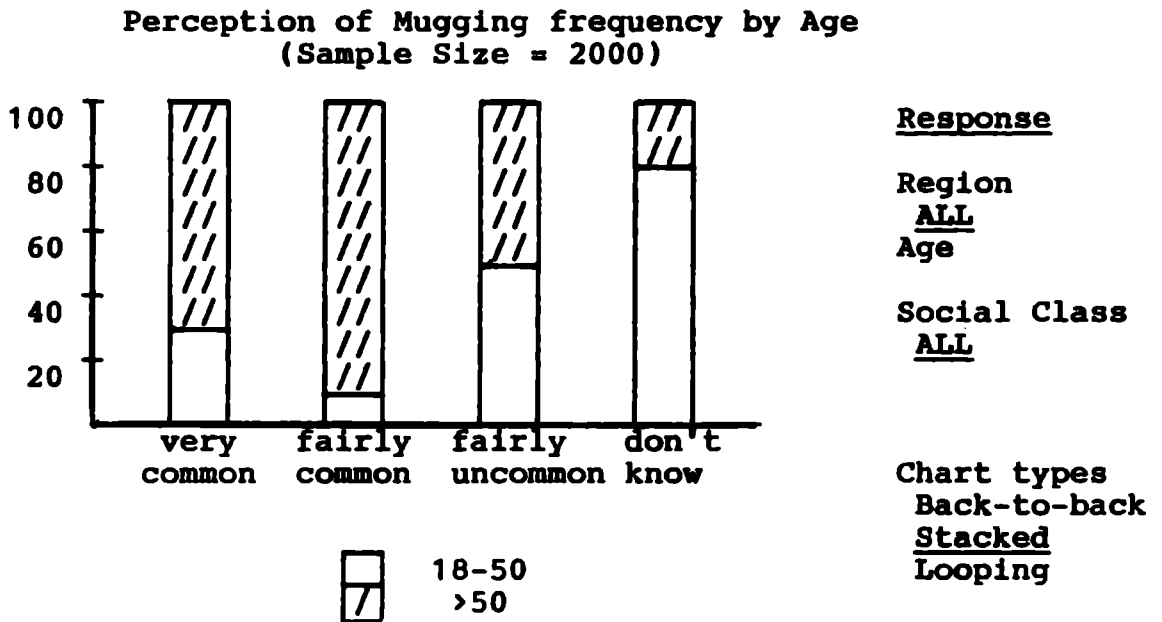


A1.7 Display showing the Uncertainty (see section 5.8.7)

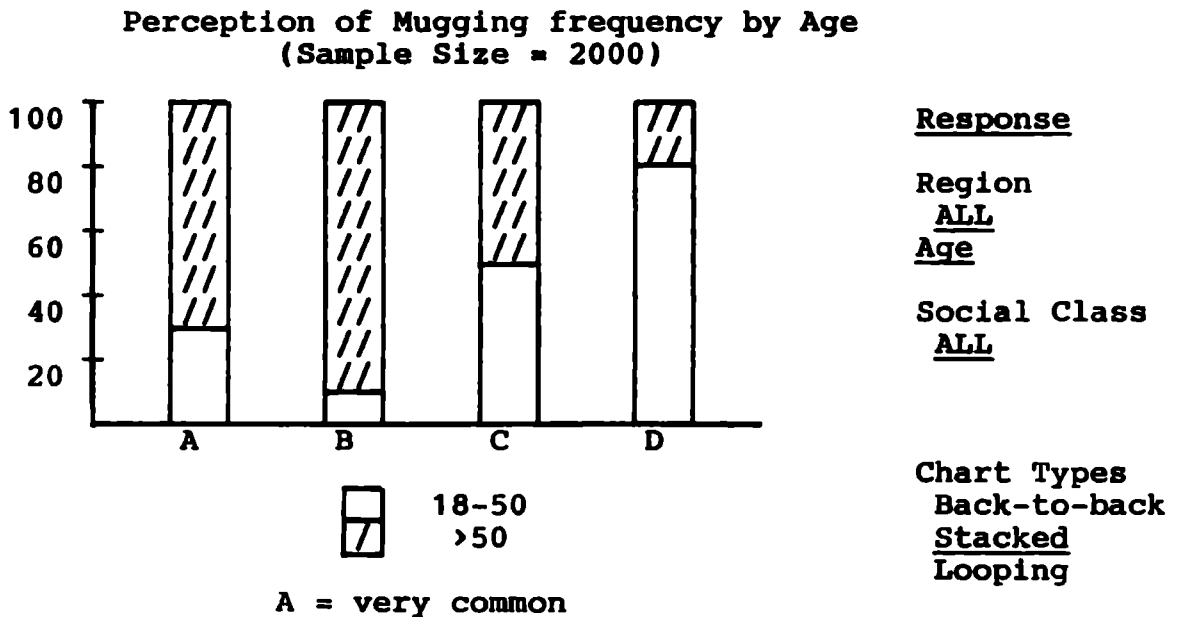
Perception of Mugging frequency by Response by Age
(Sample Size = 2000)



A1.8 Adjusted Stacked Bar Chart (see section 5.8.8)



A1.9 Adjusted Stacked Bar Chart using abbreviations (see section 5.8.8)



Note: The abbreviation key is displayed centre justified at the bottom of the screen.

A1.10 Regroup display 1 (see section 5.8.14)**Select groups to re-include**

- 1 A Group1**
- 2 B Group2**
- 3 C Group3**
- 4 D Group4**
- C E Combined Group**

A1.11 Regroup display 2 (see section 5.8.14)**Select category to regroup**

- 1 Very Common**
- 2 Fairly Common**
- 3 Not Very Common**
- 4 Don't Know**
- C Very Common**
Fairly Common
Not very Common
Don't Know

A1.12 Regroup display 3 (see section 5.8.14)**Select destination group**

- 1 Very Common**
- 2 Fairly Common**
- 3 Not Very Common**
- 4 Don't Know**
- C Very Common**
Fairly Common
Not very Common
Don't Know

A1.13 Regroup display 4 (see section 5.8.14)**Select groups to be omitted**

- 1 A Group1**
- 2 B Group2**
- 3 C Group3**
- 4 D Group4**
- C E Combined Group**

A1.14 Regroup display 5 (see section 5.8.14)

Enter new group names and abbreviations

1 A Group1

2 B Group2

3 C Group3

4 D Group4

C E Combined Group

A1.15 Format of Status Page in Help (see section 6)

Number of last frame read: 12345

Last item examined: POPULATION OF CORNWALL

Last gazetteer entry referenced: STREATHAM HILL

Grid references for current map:

Bottom left: 0526 0158 (TQ 26 58)

Top right: 0530 0161 (TQ 30 61)

For Overlay operation:

Current area of interest:

HEREFORD AND WORCESTER

Current areal unit:

DISTRICT

Current resolution: 3 km

A1.16 Screen for Reconfigure Operation

HELP

Display colours

'CYAN ' 'YELLOW ' 'BLUE '

Display position

To right: '-3 ' To bottom: ' 10'

Search scope

Proportional spacing

'PHOTOGRAPHIC' 'ON '

Floppy disc filenames

Write: ' '

Bookmark: ' '

Configuration: ' '

OS command

' '

B1. Appendix B1 - Excluded Sections**B1.1 Introduction**

This Appendix defines the sections of the main Functional Specification which are initially excluded from the initial implementation of the Domesday Retrieval Software.

They each have a priority number of 1 to 13 (corresponding to the most desirable to the less desirable) as a guide to what should be included subsequently if time allows.

Where complete functions have been excluded the menu bar entries normally used to invoke these functions are left blank. For the chart type alternatives Scattergram and Stacked bar chart the corresponding entries in the Chart Key are left blank.

B1.2 Ring - Priority 13

Ring function in the Map Operation on the Community Disc is excluded.

Section 4.4.5.

B1.3 Box and Feedback - Priority 3

The Box, Feedback, Clear and some parts of Enter function in the Area Operation on the National Disc are excluded.

Sections 5.5.5, 5.5.6 and 5.5.8 are not included and section 5.5.7 becomes:

5.5.7 Enter

Having successfully completed the Name or Grid operations if the desired area is stored as a background map it is fetched from the disc and displayed, the menu bar becomes:

< Help Main Reselect

Selecting Reselect causes the Area operation to be restarted at the top level to choose another area.

If the user is currently running an unforced area operation then selecting Main will return the user to the top level of the Area operation. The menu bar is:

< Help Explore ----- Contents Find

If the user is executing a forced area operation then Main will cause the Overlay operation which caused the forced operation to become active again and the Map Overlay display (see section 5.7) will be presented immediately.

B1.4 Print Text - Priority 14

Printing the text associated with the data set in the Mappable data display operation on the National disc is excluded.

Section 5.7.4.

Printing the text associated with the data set in the Chart data display operation on the National disc is also excluded.

Section 5.8.14.

B1.5 Signed Chi Squared - Priority 12

The Signed Chi Squared automatic reclassing technique in the Mappable data display operation on the National disc is excluded.

Section 5.7.17.

B1.6 Rank - Priority 4

The Rank option in the Mappable data display operation on the National disc is excluded.

Section 5.7.19.

B1.7 Court - Priority 8

The Court function to correlate two Map patterns after classing in the Mappable data display operation on the National disc is excluded.

Section 5.7.27.

B1.8 Stacked Bar Charts - Priority 6

The option to plot Stacked bar charts in the Chart data display operation on the National disc is excluded.

Section 5.8.4.

B1.9 Scattergrams - Priority 7

The option to plot Scattergrams in the Chart data display operation on the National disc is excluded.

Section 5.8.10.

B1.10 Uncertainty - Priority 10

The option to calculate and display the uncertainty associated with the current display in the Chart data display operation on the National disc.

Section 5.8.17.

B1.11 Adjust - Priority 9

The option to show adjusted versions of the stacked and back-to-back charts in the Chart data display operation on the National disc is excluded.

Sections 5.8.5, 5.8.6 and 5.8.18.

B1.12 Alternative Character Set - Priority 1

The inclusion of the extra character set to improve the Chart displays in the Chart data display operation on the National disc is excluded.

Section 5.8.22.

B1.13 Check Reliability - Priority 11

The technique to calculate the confidence in the displayed data has been simplified to just test if less than 50 values have been included in the reference population when a percentage for display is calculated.

Part of Section 5.8.24.

B1.14 Plan - Priority 5

The complete Plan data display operation on the National disc has been excluded.

Section 5.9.

B1.15 Reconfigure - Priority 2

The option to Reconfigure the system in the Help operation (both discs) has been greatly simplified.

The option on the menu bar has been changed from Reconfigure to System, Section A1.16 no longer applies and Section 6.4 is replaced by the following:

6.4 System

When System is selected the following menu bar is displayed:

< Exit Main

and the operating system prompt ("*") is displayed left justified at the top of the display area. The user may now enter commands directly to the Operating System of the microcomputer and the responses are shown directly in the display area. In standard manner selecting Main exits the System function and redisplay the menu bar:

< Exit Demo Bookmark System Areal

Selecting Exit exits the Help facility entirely.

On the Find menu for the Community disc, shown in Figure 4.7, the 'Scope of Search' line is deleted.

On the Find menu for the National disc, described in section 5.4.2, the 'Scope of Search' line is deleted.