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sample datasets to accompany the tutorial examples described in the manual;

a copy of the ImageStream VBX and filters which can be used with *RV2* to display additional background file formats (see Background File Types);

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Use either of these US numbers between 7.00am and 6.00pm CST (Monday-Thursday) or between 7.00am and 12.30pm CST (Friday).

800-2424-PsL
713-524-6394

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Goldstone

RV2 is distributed, supported and developed by me - David Pitt - at Goldstone under licence from the University of Bristol. Please feel free to contact me with any queries which you may have and, of course, any suggestions for improvements. I'm also always interested to hear about the uses to which people are putting *RV2*. All feedback and support enquiries should be directed to:

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Buttons

Use the **left** mouse button to click on any of the following displayed buttons:

In the **Search** window....

In Cards....


Browse

Backtrack


Close


Details


Launch


Snapshot


Zoom


Spots - linking

In the **Single Edit** window....

Draw spot or line 

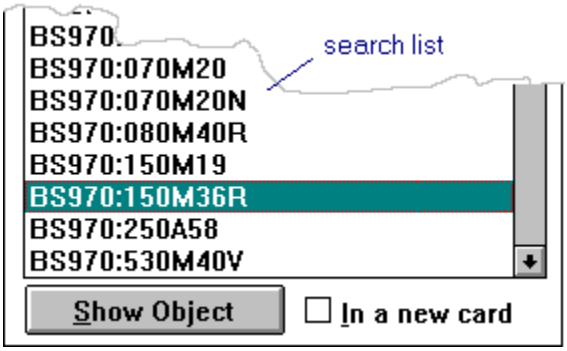
Delete spot or line


Spots - editing

Show Object (Search window button).

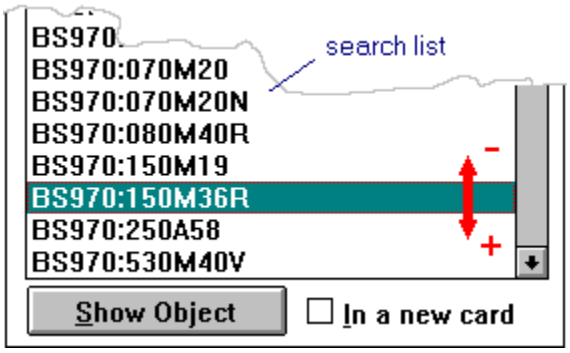
Use with the Search List to display a selected object in a card window. This button has no effect until an entry from the list has been highlighted. If the **'In a new card'** option is checked (or if no card window is currently displayed) a new window will be created to display the selection. Otherwise, the selection will replace that displayed in the Current Card window. The same result can be achieved by double clicking with the mouse on an entry in the search list.

Display of an object's foreground and background can be toggled on and off using the Show Foregrounds and Show Backgrounds commands in the **Status** menu.



Browse (Card window buttons).

Use with the Search List to display the previous or next entry from that list in the Current Card(i.e. those adjacent to the highlighted entry in the list - hence both buttons will be disabled unless an entry in the list is highlighted). The new selection will replace that displayed in the current card window.



Backtrack (Card window button).

Discards the currently displayed object to display the previous object in the Stack (just like the **Back** button at the top of this **Help** window). The option is disabled if the card is displaying the first option in the stack (i.e. the stack number is 1). If the previous link was a **Query Link** (see Link Types) then the backtrack action will restore the previous contents of the Search List.

Close (Card and Single Edit window button).

Closes the window. The same result can be achieved using the ALT and F4 keys together. Note that the card and Single Edit windows do not include a control menu.

In the case of the Single Edit window you will be prompted to save any changes to the object or foreground being edited. (See Save Object and Save Foreground.) Also note that the **Close** menu option in the Single Edit window has exactly the same effect as this button.

Details (Card and Single Edit window button).

This displays in a single dialogue box **all** the attributes of the currently displayed object, including any Fixed Attributes (description, foreground and background) which the object has. Conversely, remember that foregrounds often only show selected attributes.

Entries can be copied from here to the standard Windows clipboard for reuse elsewhere.

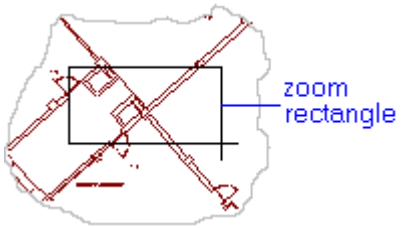
 # Zoom (Card and Single Edit window buttons).

These buttons are only displayed if the current object uses a vector format background (such as an HPGL file - see Backgrounds). The left button allows you to magnify the display of a selected area of the card:

1. Click on the zoom (left) button. (The cursor shape will change to a cross-hair and the button will appear depressed until the next 2 steps are completed.)

2. Click on one corner of the area chosen for magnification and keep the left mouse button held down.

3. Move the mouse, stretching a rectangle (see picture below) over the chosen area before releasing the mouse button.



Note: If the selected area is too narrow (or too short) the selection will be ignored and the 3 steps must be repeated. Also note that there is an absolute limit on the level to which an image may be magnified, after which an 'Invalid Zoom' message will be displayed.

This zoom operation can be used repeatedly to increase the magnification further. Note that vector images are scaled to fit the card window, so an image can also be magnified by enlarging the window.

The right ('Unzoom') button is used to reinstate the image's original magnification. If this button is disabled (and greyed) then the image is at its original size.

Launch (Card and Single Edit window button).

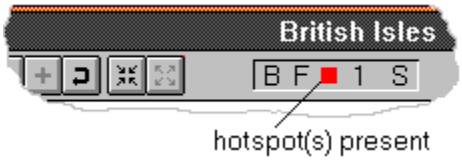
This button is only displayed if the current object uses an executable format background (either an independent program or a data file whose type has been associated with a program in the Windows File Manager - see Backgrounds). The background file will not be displayed within the card window but will be executed independently when this button is first selected. Subsequent use of this button (when the background program is still running) merely shifts the focus onto the program and shows it as the 'on top' window.

Snapshot (Card and Single Edit window button).

This button copies the contents of the card window to the Windows clipboard. The clipboard image can then be pasted into another application (for example, a word processor).

Spots - linking (Card window buttons).

A red spot in the top band of a card indicates that the card includes active spots (i.e. 'hotspots'):



The hotspots may not be visible on the card but their location can be detected by the change of the cursor from the normal arrow to a hand shape - just like the hotspots in this **Help** system. Whenever the cursor is shown as a hand you can click with the left mouse button and follow whatever links have been associated with that hotspot. The link action can be reversed using the backtrack button.

See Foregrounds and Spots, Backtrack.

Draw Spot or Line (Single Edit window buttons).

These are used to create the individual components of a foreground - use the right button for simple lines and the left button for everything else (red boxes, buttons, red spots, etc...). The drawing process is the same in both cases:

1. Click on a **draw** button. (The cursor shape will change to a cross-hair and the button will appear depressed until the draw operation is completed.)

2. Click on the card at the point where you wish to start the symbol and keep the left mouse button held down.

3. Move the mouse, stretching the resulting rectangle or line to the chosen size (see figure below) before releasing the mouse button.

After drawing a line no further action is necessary. After drawing a rectangular component a dialogue window will open on the screen and you can use this to specify the spot type and to attach text and/or a link (see Spot Dialogue Box).

Except when displaying vector background files, you can scroll up and to the left of the standard display area in the Single Edit window and then draw spots or lines in this newly revealed area. When you display the resulting foreground in a card the origin of the display will be shifted so as to fit in these new items. You can use this technique to create extra 'margin' space at the left or top of a text file or bitmap.

Additional notes:

Any additions to a foreground component will not be saved until a Save Foreground command has been issued.

If you a draw rectangle which is too thin or a line which is too short then the draw action will be ignored and the 3 draw steps must be repeated.

For editing purposes grey dotted lines are used to show the location of the bounding rectangles of red spots and invisible spots (in the Single Edit window only).

If a **Snap** grid has been overlaid on the card then the precise location of the rectangle or line will be determined by this grid (see Snap).

Red spots can be located in any one of the rectangle's corners. When first drawn the spot will be placed at the corner at which you started drawing (to change this position see Spots - editing).

Delete Spot or Line (Single Edit window button).

Used to remove individual components of a foreground. Click on the **delete** button and then on the component to be removed.

As you move the cursor over a spot or line the cursor shape will change to ✕.

When deleting several components note that you need to click on the **delete** button each time.
Note. Any changes to a foreground will not be saved until a Save Foreground command has been issued.

Spots - editing (Single Edit window buttons).

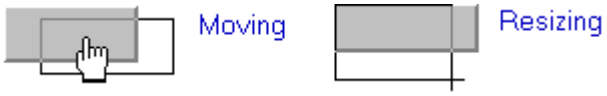
You can interact with a spot in the Single Edit window in 4 different ways in order to move it, change its size or change its contents (type, text and link).

Moving. Move the cursor over the spot so that the cursor shape changes to a **hand**. Click on the spot with the mouse and hold the mouse button down while dragging the spot to a new location (see figure below). The spot will be redrawn when you release the button.

Resizing. Move the cursor to the edge of the spot so that the cursor shape changes to a **cross-hair**. When you click on the spot the nearest corner of the spot will move to the cursor position. Now hold the mouse button down while dragging the corner of the spot to a new location (see figure). The spot will be redrawn when you release the button.

Changing Type, Text, and Link. Move the cursor over the spot so that the cursor shape changes to a **hand**. Click on the spot with the mouse and release the mouse button without moving the cursor. A dialogue window will open on the screen in which you can alter the spot type, attached text and associated link (see Spot Dialogue Box).

Changing Text Properties. If you use the previous selection process but hold down the **Shift** key when clicking on a spot then you can access the Text Control functions directly (rather than via the **Text Styles** button on the Spot Dialogue Box).



The resize operation can also be applied to lines.

Additional notes:

Any changes to a foreground component will not be saved until a Save Foreground command has been issued.

When resizing a red spot the spot will move to the modified corner of the rectangle. Hence to move a red spot to a different corner just click on the chosen corner.

If a **Snap** grid has been overlaid on the card then the precise new location of the rectangle or line will be determined by this grid (see Snap).

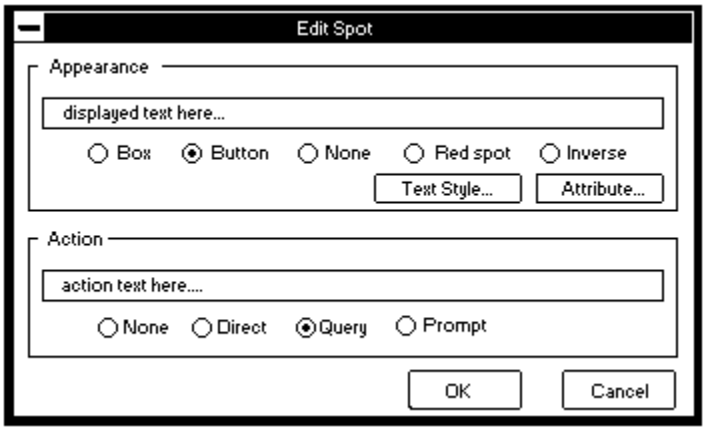
For editing purposes grey dotted lines are used to show the location of the bounding rectangles of red spots and invisible spots (in the Single Edit window only).

If you drag a spot around but then release the mouse button with the spot in its original position (i.e. unmoved) the Spot dialogue box will be displayed.

To move one end of a line click on a point near the end of the line - the cursor will appear as a cross-hair. To move the whole line click nearer to the middle of the line - the hand cursor will appear.

Spot Dialogue Box

When, in the Single Edit window, you draw a new spot or click on an existing one (without moving it) you will see a dialogue box which looks like this:



'Appearance' control set

The upper set of controls determine the appearance of the spot on the screen: select one of the top row of radio buttons (**Box**/**Button**/**None**...) to set the spot type (see Spot Types); use the edit box immediately above the radio buttons to enter text for display on the spot.

By default the text will be centred within the spot's bounding rectangle and clipped to the size of the rectangle. The text will be split onto multiple lines if necessary and if sufficient height is available. Extensive control of text colour layout, size and so on can be accessed via the **Text Style** button (see Text Control).

You can display the value(s) of an attribute by using the **!** or **?** symbols at the start of the text. The first of these options - to display the value of an attribute for the current object - can be achieved directly using the **Attribute** button. Click on this and you will be shown a list of all the possible attributes; just select one of these and it will be inserted in the text box with **!** in front. For full details on the use of these two symbols see Displaying Attribute Values.

'Action' control set

These controls can be used to attach an action to a spot. 4 types of action are currently possible (see Link Types):

Direct (a direct jump to another named object).
Click on the appropriate radio button and you will be shown a list of objects from which to choose. Your choice will be displayed in the **Action** text box alongside a number.

Query (apply a search to the dataset and, optionally, display the first matching object).
Click on the appropriate radio button and enter a query string in the text box which then appears. Tip: you can paste strings to this box from the Windows clipboard - test them first by issuing a Query command. (See Query Syntax.). When defining a Query Link you are presented with 3 options:

1. to apply the query to the current search list (or to reset the list first)

2. to display the first matching object (or to leave the current card displayed)
3. to prompt the user to supply any missing blackboard values (or to ignore any conditions in the query for which no value is present).

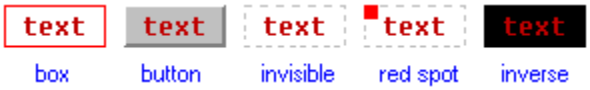
Prompt (ask to user to supply a value for a predetermined attribute).
Click on the appropriate radio button and you will be shown a list of attribute names from which to choose. Your choice will be displayed in the **Action** text box.

You can, of course, choose to have no action associated with the spot by selecting the **None** radio button. Any text in the Link text box will be erased.

Note that changes to the Action text are always made via a dialogue - you cannot edit the contents of the text box directly.

Spot Types

Spots can take one of 5 display forms. In the Single Edit window they will look like this:



In a card window the dotted grey boundary is not shown. The active region of a red spot is restricted to the spot itself; in all the others the full rectangular boundary is active.

To change a spot's type simply select a new type using the radio buttons in the Spot Dialogue Box. The red spot can be located in any corner of the rectangle. See Spots - editing

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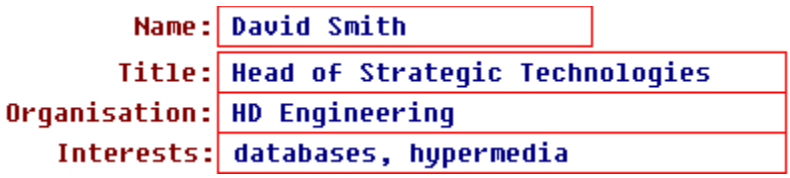
Displaying Attribute Values

You can use a spot to display the value(s) of an attribute by using the **!** or **?** symbols at the start of the spot text. For example, if an object has an attribute **surname** with the value **Smith** then you could enter the string

!surname

in the Spot Dialogue Box. The spot would display the word **Smith**. Thus whenever this spot is displayed in a card *RV2* will attempt to find a value of **surname** for the displayed object. This approach can be used to create form-style foregrounds which can be used with many different objects:



The fixed text is by default shown in red while blue indicates the use of **!**. Note how if an object has multiple values of an attribute (e.g. **interests**) these are all listed, separated by commas. The text used in each spot to achieve this result might take the following form (note that the 'caption' text here - **Name:** etc. - is unrelated to the precise attribute names):

%Name: **!name**
%Title: **!title**
%Organisation: **!company**
%Interests: **!interests**

The **?** symbol has a similar effect, except that values for the specified attributes are extracted from the Blackboard, rather than from individual objects, and are typically shown in green.

The **!** symbol can also be used to display an object's Fixed Attributes (description, background file name, or foreground name) using the special forms:

!_description **!_foreground** **!_background**

These three strings can be shortened to the first 6 characters (**!_desc**, etc.) and written in upper or lower case. Note that, conversely, the case of attribute names is critical unless the Case Sensitive option has been switched off.

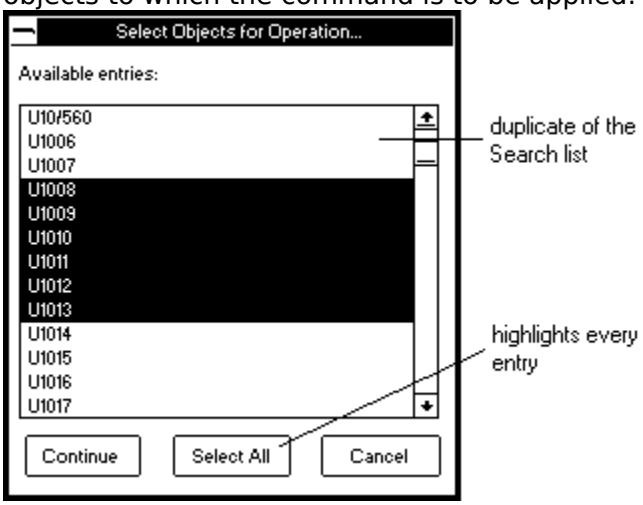
In a card if no match is found for the specified attribute then no text will be displayed; in the Single Edit Window the original string (e.g. !surname) is shown.

The **!** and **?** symbols can similarly be used as part of a query - see Contextual Queries.

Extensive control of text colour layout, size and so on can be accessed via the **Text Style** button in the Spot Dialogue Box (see Text Control).

Multiple Object Dialogue

This dialogue box is used by several multiple **Edit** commands in order to identify those objects to which the command is to be applied:



Multiple selections can be made from the list using normal Windows techniques but you can also **Select All** and then unselect some of the entries or **Continue** immediately.

The contents of the list are the same as the Search List, so if an object which you want to act on is not included you will need to use an Undo or Reset command first.

Tip: When you want to operate on a lot of objects try using a Filter or Query to display those objects (and only those objects) in the **Search List** - then you can just use the **Select All** button every time.

This dialogue is used with:

Objects Delete
Foregrounds Load
Foregrounds Clear
Backgrounds Load
Backgrounds Clear
Attributes Add
Attributes Remove Objects
Attributes Use as Description

Fixed Attributes

The term **Fixed Attributes** is used to refer to the **description**, **foreground** and **background** of an object in cases where these are treated in a similar fashion to the other attributes (also see Objects and Attributes). In these cases the fixed attributes are distinguished by the use of an underscore character at the beginning.

Thus **_description**, **_foreground** and **_background** may all appear at the top of the Details dialogue box or of the attribute **name** list in a Filter dialogue. You can perform a filter using a fixed attribute just as you would with any other attribute.

Fixed attributes can also be displayed in spots by using the **!** operator (see Displaying Attribute Values) or incorporated within queries (see Query Syntax). The three strings can be shortened to the first 6 characters (**!_desc**, etc.) and written in upper or lower case. The only other differences between treatment of these and of conventional attributes are:

(1) fixed attributes cannot be stored to the Blackboard, and hence cannot be associated with the **?** operator;

(2) comparative query operations (**<>**, **>**, **LIKE**, etc.) cannot be used with fixed attributes.

Hence the following forms of query are allowed:

_desc=Derek
_desc=!author
!!_desc
author=!_desc
_desc=?author

But not:

author=?_desc
??_desc
_desc LIKE "Der%"

See also Contextual Queries.

Dataset File Formats

RV2 can currently read datasets (with Open or Append) from three different file formats: its own binary and ASCII file forms and a comma-delimited format which can be created by most PC database software. The first of these can only be created and read within *RV2*. But the other two are described here, since you can create and modify them externally (for example with a simple text editor).

In both ASCII file formats double quotes ("") around a string are ignored, but you should include them if, for example, you want a name or value to include a comma, thus:

..., "a small, red bicycle", ...

Comma Delimited Format

Each object is listed on a separate line as a series of attribute values separated by commas. The order of the values matches a list of attribute names which must be provided as the first line. Thus...

Surname, Forename, Title, Age
Smith, Eric, Mr.,43
Jones, Angela, Dr.,27
...etc...

The contents of the first line would be referred to, in a conventional PC database, as the **Field names**, and the subsequent lines as individual **Records**. Each field name becomes an attribute name and each record becomes an object.

You must include commas for every field, even an empty one...

Jones, Angela,,27

Note that this format only contains information about each attribute's objects - there is no information about foregrounds, backgrounds or descriptions. By default, when you load a file of this format, *RV2* uses the first attribute/field as the description (in addition to storing it as an attribute). The Use Attribute as Description command allows you to change this.

***RV2* ASCII Format**

This format only exists for debug purposes and will ultimately be discontinued - only a summary is given here. Such a file can be created externally or by using the Save As... File command with the **Trace** configuration option switched on (see Configuration Settings).

Each object is assigned a unique integer ID. The first line specifies the integer for the **Starter Object** or **0** if no starter is defined. The rest of the file is in three sections - objects, attributes and foregrounds - each terminated by **-999** on a separate line:

Starter card 0
1, 0, 3, CR-1S.BMP, Conrod photo (16)
2, 1, 4, CR-FES1.P33, Conrod stresses
3, 1, 4, DEMO7D.P33, Helix demo
4, 0, 6, , Business procedure
5, 2, 5, RFIG1A.HPG, Strain signals
...etc...
-999

Type, Plot, 2, 3, 5
Subgroup, Procedures, 4
Project, Conrod, 1, 2
Project, QWave, 3, 5
...etc...
-999
 # 1 Ansys overlay
2 1 0 41.7 -8.3 791.7 -175 5656 38 0 {File type:}
3 1 1 791.7 -166.7 1791 -8.3 0 0 0 {!File type} 4
1 1 0 1950 -8.3 2708 -175 5656 0 0 {Project:}
3 1 2 4033 -8.3 2708 -175 5656 0 0 {!Project} !!Project
-1
 # 2 signal overlay
3 1 0 7170 6500 -50 6000 0 0 0 {HPGL output generated by fatigue analysis s/w}
-1
...etc...
 # 0
-999

Each 'Object' line lists:
ID, foreground number (**0**=none), background type, background file (empty for none), description

Each 'Attribute' line lists:
Name, Value, IDs of all objects with this attribute combination.
Long lines can be split - start the new line with **+** to denote a continuation.

Each 'Foreground' consists of:
*Foreground_Number Title*
....One line per spot....
-1

Each 'Spot' consists of:
Spot type **1** *Link type X1 Y1 X2 Y2 font para page* **{***Visible text***}** *Link text*

Also Datasets, Background File Types, Objects and Attributes, Spot Types, Link Types.

Background File Types

The background file formats recognised by *RV2* are listed below. When loading a background file (using either the Single or the Multiple version of the Background Load command) you may be given the opportunity to specify the file type or to use *RV2*'*s* choice. You can also change the type later using the Background Type command - for example, HPGL plot files can be viewed as graphics or simply as text. The treatment of background files generally takes one of two routes....

Text and bitmapped graphics files are displayed in a scrollable window at a fixed scale - the same fixed scale as is used for cards with no background. This means that a foreground that has been designed for use with one of these formats will display correctly with all of them. Note that executable files are also included in this general category since display is similar to that for cards with no background.

Plain (ASCII) Text Files
Lines of more than 80 characters are wrapped. Typical file extensions include **.TXT .C** and **.BAT** but you can load virtually any file as this type. *RV2* will just try to display the ASCII characters within the file. This can be used to check the contents of file types like HPGL. You can also use this approach, with mixed results, to look at the text content of Microsoft Word documents.

Compuserve GIF (Graphics Interchange Format) Files
87a and 89a interlaced and non-interlaced single image files can be displayed. (Multi-image files are not currently handled.)

PCX
Common format originally created for use with ZSoft's Paintbrush program.

Targa
Targa TGA format was developed by Truevision for their Targa and Vista products. *RV2* can display types 1, 2 and 9, as well as most type 10 files.

TIFF (Tag Image Format Files)
Intended as a standard for images, but available in a bewildering variety of formats. *RV2* supports single image files in 6 encoding formats: no-compression, Huffman, Pack Bits, LZW, Fax Group 3, and Fax Group 4.

Windows Bitmaps
Standard **.BMP** and **.DIB** Windows file formats, including **RLE** formats.

Windows Executable Files
This option allows an object to be associated with an independent program. The background file is not displayed in a card but it runs independently and is triggered from *RV2* by the Launch button. The object card can be used to display an associated foreground.

Windows Write Files
Standard **.WRI** document files, including display (but no editing) of embedded OLE objects.

Word Perfect v5 Documents
This is a partial implementation, allowing you to view the text contents of version 5.2 documents but not handling several aspects, including graphics and tables. The standard

file extension is **.DOC** but note that *RV2* will automatically attempt to display a non-compliant file with this extension as plain text.

Miscellaneous Bitmaps
If the ImageStream VBX (ISVB) Filters have been installed with your copy of RV2 (see Configuration Settings) then the following bitmap file formats can also be displayed. (When prompted to specify a file type just select the Miscellaneous Bitmaps option.) Note that in each case the background file extension must match one of those listed here.

Joint Photographic Expert Group (JPEG) Format (***.JPG**)
- not the fastest JPEG display routine in the world! Please be patient.

Kodak Photo CD bitmaps (***.PCD**)

Vector graphics files are scaled to fit within the display window. They are all zoomable (see Zoom). Because the dimensions of the original image (and hence the display magnification used) vary between formats, a foreground which has been created for use with one vector file format cannot normally be reused with a different type .

Hewlett Packard Graphics Language (HPGL) ASCII Plot Files
This is a very common mnemonic-based ASCII vector format which can be produced by many PC and workstation programs. *RV2* has been successfully tested with HPGL files generated by several different packages, including **AutoCad**, **Medusa**, **ProEngineer**, **TurboCad**, **Freelance**, **Lusas** and **CadKey**. Some aspects of the language have yet to be implemented. Standard extensions include **.PLT** and **.HP?** (where **?** can be any character).

Windows Metafiles
This is the standard **.WMF** Windows file format. Both the placeable and non-placeable versions can be displayed.

Miscellaneous Vectors
If the ImageStream VBX (ISVB) Filters have been installed with your copy of RV2 (see Configuration Settings) then the following vector file formats can also be displayed. (When prompted to specify a file type select the Miscellaneous Vectors option.) Again the background file extension must match one of those listed here.

Adobe Illustrator File (***.AI)**
AutoCAD 2D Drawing Interchange File Format (***.DXF**)
AutoShade Rendered Images (***.RND**)
Computer Graphics Metafiles (Binary format) (***.CGM *.BIN**)
Encapsulated Postscript File (***.EPS**)
Harvard Graphics Chart Files (***.CHT *.CH3**)
Harvard Graphics Symbol Files (***.SYM *.SY3**)
Lotus 123 Picture File Format (***.PIC**)
Micrografx Drawing File Format (***.DRW**)
Macintosh PICT Format (***.PCT**)
WordPerfect Graphic File Format (***.WPG**)

Background File Paths

RV2 stores references to background files using, wherever possible, the path of the file relative to a default dataset path. The **default path** is that of the last dataset to be opened and can be identified using the Dataset Stats command.

If a background file and a dataset file are in the same directory the datasets reference to that background will only cite the file name (without any directory). If the background is in a sub-directory (e.g. **PICTURES**) only the sub-path (below the default path) will be stored (**PICTURES\EXAMPLE.BMP**).

This is important when you want to move or copy a dataset, and all the background files associated with it, to another disk or directory. If all the backgrounds are in the same directory as the dataset, or in sub-directories of it, then the whole structure can be moved without worrying about losing references to backgrounds, i.e. if you want to produce a distributable data set keep the dataset file at the top of a tree structure which holds all the relevant files.

Conversely, if you want to move a dataset without moving related background files use the Save As... command. This will take account of changes to the datasets path and modify all the background references accordingly.

Export and Print Formats

The File, Export command allows a choice of 4 different file formats for output. All bar the **Tabbed Column** option are also available from File, Print.

Comma Separated Fields

Each line of data represents a single Object and each field an attribute of that object. Each attribute is enclosed in double quotes and separated by commas. This format is suitable for importing into many traditional Word Processing applications for mail-merge use or into other standard Databases. If you choose to **Include attribute names** then the first line of output will be a list of names. Thus....

```
"name","organisation","phone"
"Antonio Fellini","Fiat Company Ltd","+44 39 55 713 4350"
"Daniel Single","CraySystems","+1 777 674 5321"
"David Sendall","Gears Machinery","+44 245 699 7413"
"Debby Sindhurst","Footwear Ltd","+44 392 225 770"
```

Fixed Width Format

This is another one-line-per-object format. However in this case attribute entries are padded with space characters to a fixed width suitable for loading into a simple Text Editor such as the Windows Notepad. If you **Include attribute names** then column headings and an extra blank line are included at the top.

```
name              organisation        phone

Antonio Fellini   Fiat Company Ltd   +44 39 55 713 4350
Daniel Single      CraySystems         +1 777 674 5321
David Sendall      Gears Machinery     +44 245 699 7413
Debby Sindhurst    Footwear Ltd        +44 392 225 770
```

Tabbed Column Format

This is almost identical to the Fixed Width form, except that a tab character replaces the padding space characters, thereby allowing column layout to be readily adjusted in Word Processing applications.

```
name              organisation        phone

Antonio Fellini   Fiat Company Ltd   +44 39 55 713 4350
Daniel Single      CraySystems         +1 777 674 5321
David Sendall      Gears Machinery     +44 245 699 7413
Debby Sindhurst    Footwear Ltd        +44 392 225 770
```

Paragraph per Object Format

In this a fresh line is used for each attribute and a blank line indicates the end of entries for a particular object. This can be useful when, for example, producing a summary report. The **Include attribute names** option places the name and colon, packed with spaces to a fixed width, ahead of each entry:

```
name         : Antonio Fellini
organisation : Fiat Company Ltd
```

phone : +44 39 55 713 4350

name : Daniel Single
organisation : CraySystems
phone : +1 777 674 5321

name : David Sendall
organisation : Gears Machinery
phone : +44 245 699 7413

name : Debby Sindhurst
organisation : Footwear Ltd
phone : +44 392 225 770

Note that when exporting or printing from *RV2*, the data has to be converted to a more conventional arrangement (with the same fixed number of attributes - typically 'fields' - for every object). This has three main implications:

1. Since several objects need not have the same number or combination of attributes, some of the resulting 'fields' may be empty for some (but not all) of the objects.

2. Multiple values of the same attribute for one object must be treated as separate 'fields' and are given unique names. Thus, if one of the objects to be exported has three values of **interest**, then three separate columns or rows will appear in the output bearing the titles **interest1**, **interest2**, **interest3**.

3. Object Description and Background name, if requested, are treated in the same way as any other attributes but appear as the first two 'fields' in any output.

Configuration Settings

RV2, in common with most Windows applications, makes use of a .INI file to store configuration information - information that can be reloaded each time you start running the program. In the case of *RV2* this file is called **RV2.INI** and resides in the same directory as Windows (probably C:\WINDOWS or something similar).

With a little care you can directly modify the contents of this file. Don't do this while *RV2* is running. (The contents are almost invariably updated whenever you exit from the program.) There may be up to three sections in the RV2.INI - **Recent Files**, **Options** and **Blackboard Pairs**. The admissible contents of each section are listed below.

[Recent Files]

Up to four entries corresponding to the most recently loaded files (and displayed in the File menu - see Previous files (1-4))...

```
File1=d:\revc\examples\examples.rix
File2=d:\revc\samples\cards.rix
File3=d:\plastic.rix.
```

[Options]

Five entries corresponding to the Options commands which can be checked (1) and unchecked (0) ...

```
Case=1
ShowBackground=1
ShowForeground=1
ShowSecondaries=1
ConfirmMultiple=1
```

Three parameters which together define the Text Defaults...

```
DefaultFont=0x0210
DefaultLayout=0x0025
DefaultAColors=0x0103
```

Two options with which you can limit the number of colours used to display bitmaps so that, for example, 256 colour images can be viewed on a 16 colour display.....

```
MaxBits=4
Dither=JJN
```

An option to switch on *RV2's* debug trace. You also need this set to 1 to create ASCII dataset files (see Dataset File Formats)

```
Trace=0
```

An option to use the ISVB filters if they are installed (see Background File Types). *RV2* will set this to 0 if the filters are missing....

```
UseISVBFilters=0
```

And two settings which are currently ignored..

DefaultWidth=510
DefaultHeight=455

[Blackboard Pairs]

If, when you exit from *RV2* or clear a dataset , there are any attributes in the Blackboard, you will be asked whether you wish to retain them. If you answer yes these attributes will be written to this section of RV2.INI for reloading into *RV2* (otherwise this section will be absent from the file). Each entry contains a name and one or more values. Values should be separated by commas and enclosed in quotation marks. For example...

Author="me","someone else"
Title="Feasibility study"

An attribute name must not appear in more than one entry line.

Dithering

If you want to view images which contain more colours than your hardware can display, you will probably find *RV2*'s automatic dithering feature useful.

Dithering options are set using the configuration file, RV2.INI. Use **MaxBits** to specify (in bits) the limit you wish to set on image display. For example, to display all 8 bit and 24 bit images using just 16 colours set MaxBits=4. For MaxBits to have any effect, it must take one of the following values:

1	(monochrome)
4	(16 colours)
8	(256 colours)

Dither specifies the method to be applied to the image and, if included, must take one of the following values:

FS4	Floyd-Steinberg (default)
JJN	Jarvis-Judice-Ninke
Sharp	Capix - sharp tones
Smooth	Capix - smooth tones

Capix dithering cannot be used with MaxBits set to 8.

Also bear in mind that dithering will increase the time taken to process a background image before it is displayed.

RV2 Help

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Introduction

The concepts and terminology of *RV2*.

Operations

Finding the right command for a task.

Reference

RV2's menus, buttons and query syntax.

Registration

Why and how you should register this shareware.

Notices

Warranties and trademarks.

Reference Menu

Introduction

If this is your first look at *RV2* you should use the last two buttons at the top of this window to browse through the 11 introductory topics listed below in order.

RV2 is...
Objects and Attributes
Backgrounds
Foregrounds and Spots
What you see .... Cards
Datasets
The Search List
Filters and Queries
Link Types
The Stack
The Current Card

The following topics are a bit more advanced and mainly include information which you would only need if you are creating data in *RV2* (rather than just viewing existing *RV2* data sets).

Reduced Search Space
The Blackboard
Editing
Creating Datasets
Primary & Secondary Attributes
Text Control

RV2 is....

RV2 is a medium for locating and viewing information which can be in many different formats. At the heart of the system is a flexible database with which you can easily index and retrieve this information and one or more card windows within which you can view, browse and interact with information.

The information can include existing external data (documents, photos, drawings, tables...) on which you can superimpose internal data. You can use this internal data to help you find things later or simply to enrich and enhance the external 'chunk' of information. *RV2* is not generally concerned with maintaining or altering the contents of these external chunks - they are taken as seen and accessed in their original format - you don't have to import items into *RV2* to be able to make use of them.

We refer to the individual chunks of information, whether internal or external, as Objects....

If this is the first time you have used *RV2*, use the last of the buttons at the top of this screen to browse through the rest of the introductory topics now.

Objects and Attributes

Individual data items - drawings, photos, documents, records - are referred to in *RV2* as **objects**. All objects are stored at one level in *RV2* - there's no hierarchy among objects and no explicit use of object typing (this is a car object, therefore it must have an engine capacity...). The aim is to be able freely to...

incorporate lots of different types of object in one set of data,
add new objects and new types,
modify the way we describe existing objects without completely rebuilding our database.

To do this we allow objects to be given properties - known as **attributes** - in as flexible a way as possible. An attribute consists of a **name** and a **value**, so we often talk in terms of **attribute pairs** (**colour:green** , **age:24**). The most important rules governing attributes are hardly rules at all, since they tell you about the constraints which don't apply:

There is no constraint on the number of attributes which any object can have (including none at all).

An object can take more than one value of any attribute (name).

New attribute names and values can be created and assigned to objects at any time.

An attribute does not have an explicit type (integer, string, date...).

Thus two objects in the same set might comprise entirely different combinations of attributes:

Object #1.
name: Mike Jones
joined company: 1866
specialisations: French history
specialisations: Colonial Africa
current project: Second Empire

Object#2.
project name: Corn Laws
coordinator: Erica Davis

In addition to attributes, each object has a **description** and two optional items - the Background and Foreground - which together determine what you actually see when you display an object.

Backgrounds

A **background** is an individual file - document, bitmap, vector file, ... - used by, but not affected by, *RV2*. *RV2* stores the name, path, and type of the background file with an object. Each object can optionally have one background associated with it, but the same background can be associated with any number of objects. Thus an object might have associated with it a background and several attributes:

background: n:\users\mjphoto.bmp (type 3)

name: Mike Jones
joined company: 1866
specialisations: French history
specialisations: Colonial Africa
current project: Second Empire

(See Background File Types for a list of the currently supported formats.)

When you request display of an object the associated background (if one exists) is displayed. Depending on the type of file involved, options to scroll or to zoom the image may also be made available. The other principal component of the display is determined by the Foreground, so named because when an object has both, the foreground is superimposed upon the background.

Foregrounds and Spots

A **foreground** is a set of display elements - lines and **spots** - which are created, stored and modified within *RV2* (unlike Backgrounds, which are stored in separate files). Each object can optionally have one foreground associated with it, but the same foreground can be associated with any number of objects. Thus an object might have associated with it a foreground, a background and several attributes:

foreground: 3. Standard personnel form
background: n:\users\mjphoto.bmp (type 3)

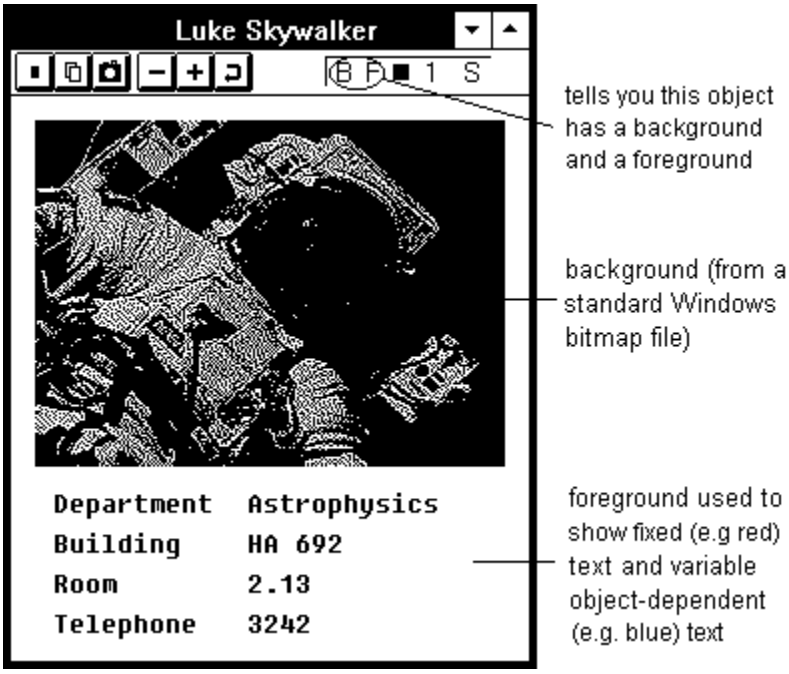
name: Mike Jones
joined company: 1866
specialisations: French history
specialisations: Colonial Africa
current project: Second Empire

Each spot in a foreground is associated with a rectangular area of the display. The spot can have a **visible component** (such as a box or button), some **text for display**, and an **action** (such as a link to another object) which will be triggered when the user clicks on the rectangle (thereby making the spot into a 'hotspot'). The different types of visible component are described in Spot Types. Standard methods for displaying text are described in the Spot Dialogue Box section but note that spots can also be used for Displaying Attribute Values. For a description of the different actions which can be associated with a spot see Link Types.

But first, check that you understand how foregrounds and backgrounds combine to display object information in Cards.

Cards

The Foreground and Background of an object are displayed together in a **card**. Cards can take a variety of forms, depending on the type of background involved and, moreover, whether an object has both a foreground and a background. Below is an example of a card created with a bitmap file as a background and a simple 'form' foreground. The latter consists of 8 separate spots displaying (on the left) fixed bits of text and (on the right) selected attributes of the object being displayed.



The various buttons and annotation at the top of the card are explained in the Buttons section.
The text at the top of the window is the object's **description** (see also Fixed Attributes).
The instructions to display cards like this are issued from the Search List.
The spots can have actions associated with them (see Link Types).

Display of the foreground and background in cards can be 'switched off' using the Show Foregrounds and Show Backgrounds options.

However, before looking at any of these topics make sure that you understand the role of Datasets.

Datasets

RV2 stores Objects and Foregrounds in a **dataset** which can be saved to and loaded from disk using File commands. (So when you run *RV2* the first thing you usually do is to load a dataset file.)

Datasets contain a series of **object** entries, each including:

a **description** and, optionally,....
a list of **attributes**
the **ID** and **name** of a **foreground**
the **path**, **name** and **type** of a Background file

Remember that all these objects are stored at the same level - there is no hierarchy - and that datasets do not incorporate the contents of a **background**.

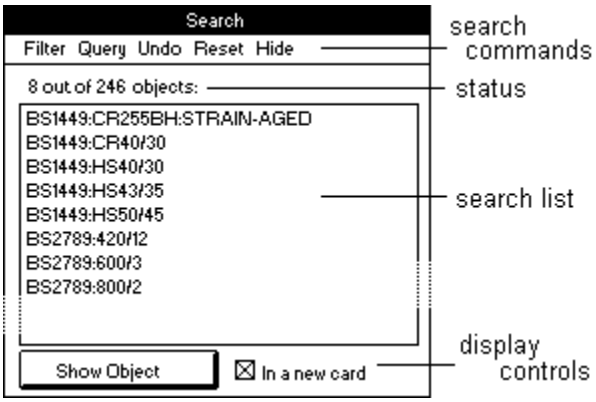
Datasets also contain a series of **foreground** entries, each consisting of an **ID** and **name** and a series of **spot** entries. Each spot entry includes:

type (button, box, line...)
position
text for display
link/action information

Several other miscellaneous pieces of information may, optionally, be held in the dataset including user preferences and the name of an object to be displayed when the file is first loaded into *RV2*. This object is known as the **Starter Object** (see Set as Starter).

For more notes on admissible dataset files see Dataset File Formats.

Search List



The **Search List** is a subset of all the objects in the current dataset, arrived at by applying searches - known in *RV2* as Filters and Queries - to the dataset. Strictly speaking the entries displayed in the list are the **Descriptions** of each object. An object from the list can be displayed in a Card simply by highlighting it with the cursor and then clicking on the Show Object button or by double clicking on the entry.

The effect of search operations is cumulative - each Filter or Query is applied to the current Search List to reduce it further - and objects can be reinstated to the Search List incrementally, using the Undo search command to reverse the action of the last Filter or Query. Alternatively the entire dataset can be restored to the list by using the Reset command.

The contents of the Search List are maintained even when the window containing the list is not visible (see Hide).

Filters and Queries

Both of these allow you to search a dataset for objects which match a specific attribute criteria. Both use the current Search List as their starting point and update that list to reflect the effect of the new search - so you can use several filters and/or queries to reduce the list step by step. Individual searches can be reversed (using Undo) - if the last search criteria was too tight you can 'undo' it and try something else.

For example you might initially want to find all the people in your database who have been involved with a specific **project**. This might leave you with a lot of entries in the search list, and wanting to reduce this further before looking at individual entries. So you then look for the **electronics** specialists within this list. Too few people left in the list ? Then we **Undo** and look for people specialising in **electronics** or in **systems**.

Filters are an interactive method of searching without resorting to any typing by selecting names (e.g. **specialisation**) and values (e.g. **electronics**, **systems**) directly from lists (see the Filter command.)

Queries use a conventional expression, incorporating combinations of names, values and operators, typed in as a line of text (see the Query command):

"outer diameter"=60 AND mass<0.5

Thus queries allow you to use more complex search criteria than you can impose in a single filter. The language of these expressions is described in Query Syntax.

Filters are far easier to use for simple searches, particularly since the lists of names and values presented for selection are restricted to those which will produce useful results - a Reduced Search Space technique is used to ensure that you always find at least one matching object (whereas it is possible for a **query** to result in an empty search list).

Link Types

Apart from their contribution to the visible components of an object, foregrounds provide the means by which you can interact with an object in a card in order to link, to search, or to ask the user for data. Hence every spot in a foreground can have a 'link' action associated with it which is triggered when you click on the spot. Three types of action are currently possible. The methods by which they can be defined and associated with a spot are described in the Spot Dialogue Box section.

Direct Links
The currently displayed object is replaced with a new ('target') one in the same Card. The target is fixed - i.e. the identity of the target object is specified in the link definition. The link is not affected by the current contents of the Search List or of the Blackboard. The new object is added to the card Stack.

Query Links (also '**Search Links**')
A predefined Query is applied to the dataset, the search list is updated accordingly, and, optionally, the first (matching) object in the new list is displayed in place of the current object. If the first match is displayed then it is also added to the card stack. This type of link is central to the philosophy of *RV2*: as more objects are added to a dataset, the link can 'find' them without itself being rewritten; conversely, a direct link does not adapt or expand as more objects are added.

Prompts
The user is prompted to select one or more values of a specified attribute name. The responses are stored in the blackboard and replace any existing entries for the specified name.

Stack

In *RV2* a **Stack** is a record of the links between objects which you have followed in a card. Thus if you display an object in a new card window then this becomes the first object in a new stack for that card. Follow a direct or query-based spot link to a new object and this object will be added to the stack (see Link Types).

The point of having a stack is so that you can return to previous objects in the stack (when, perhaps, browsing has taken you in the wrong direction) using the Backtrack button.

Each stack can hold up to 10 objects - after which you are asked to discard the earliest entries in the stack to make space for new ones. The stack also retains and restores the zoom or scroll position that you were in on earlier objects.

Current Card

You can display more than one object (each in its own Card window) at any time. The **current card** is simply the one which has been acted on most recently. Typically (but not always) the frame of the current card will be shown in a different colour to all others. The main reason for needing to identify the current card is because any instructions to display a new object, including those issued from elsewhere (such as Show Object), are applied to the current card.

You will also occasionally see mention of the **current object**. This is the latest object in the Stack of the current card.

Reduced Search Space

Reduced Search Space makes it impossible for you to apply a Filter and find that, as a result, there are no objects left in the Search List. This is done by restricting the names and values which are listed for user selection.

Thus, if a particular name:value attribute combination is not used by any of the objects left in the search list then the relevant value will not be listed for selection. If a name is not used in any combination then this too will be omitted.

As a trivial illustration one might have a dataset in which objects had, at most, only one value for **age**. On first searching this dataset one might choose to filter by selecting five values of **age** from a list of, say, twenty different values. When filtering on **age** for a second time, only five values would be listed for you to select from.

More commonly, you will wish to base the second filter on a different attribute name. For example, you might shift your attention to the attribute name **interests** and find that the range of **interests** listed may be significantly reduced by your particular choice of ages (if noone under the **age** of **35** includes **bowls** among their **interests**, and so on...).

The ability of objects to take multiple values of a particular name allows you to select singly from values of that name more than once. As an example, you might specify as a filter the name **interests** and value **tennis** and then try a second filter on this same name. The new list of available values would include **tennis**, of course, but it would also include any other values of **interests** which any of the remaining objects featured. **N.B.** Successive filters are equivalent to an **intersection** operation, for example,

interests=tennis AND interests=golf

whereas selection of multiple values in one filter produce a **union** operation (see Query Syntax and the Filter command):

interests=tennis OR interests=golf

Reduced search space is also applied to the names and values which are listed for the Remove from objects command.

Blackboard

The **Blackboard** provides a temporary store for selected attribute name:value combinations. The rules for assigning attributes to the blackboard are similar to those governing the attributes of objects (see Objects and Attributes) - the blackboard can have any number of attributes, and can have multiple values for any particular name. However you cannot store a reference to a **description**, **foreground**, or **background** in the blackboard.

The aim of having a blackboard is to be able to record and reuse information about the context of your current enquiries. You might, for example provide information about yourself and the project which you are currently interested in. This can then be used within queries to help pinpoint information of interest (using data which you only need to supply once).

To this end the contents of the blackboard can be incorporated within Contextual Queries. (For example, a query might look up the current value of **project** in the blackboard and use this as part of a logical query expression.)

You can directly modify the contents of the blackboard using the Blackboard command. Note that you can use this route to create and assign new names or values, in addition to those already in use in a dataset.

The blackboard contents are also affected by the action of prompt links (see Link Types). These can be used in a foreground to create a data entry form, where the user is asked to provide values for specific attributes.

The information stored in the blackboard is persistent - it can be stored in an *RV2* dataset file but it also remains in the blackboard when the file has been closed (unless you choose to clear the blackboard of data). Thus the blackboard provides one route for transferring small quantities of data from one dataset to another.

Editing

All the data which is stored in a Dataset can be edited interactively from within *RV2*. There are two types of editing operation:

Multiple Edit Commands

These allow you to make changes to the attributes of a group of objects, such as adding or removing attributes, backgrounds and existing foregrounds. They also include options to delete attributes, objects or foregrounds from the dataset, to edit an existing attribute name, or to use an attribute as an object's description. These commands are all accessed from the **Edit** section of the main *RV2* menu.

Changes made using these commands affect the data which is currently being manipulated in *RV2*. For these changes to be recorded in a dataset file you also need to use the Save File command.

Single Edit Commands

Changes which involve the creation of new objects or modifications to the content of foregrounds must be made using single edit commands. These commands are all accessed from the menu of the unique **Single Edit Window**. This window is launched by the **Edit, Single Edit** command in the **main** menu.

Essentially, the single edit window holds data relating to an object and a foreground, displaying them in much the same way as they would appear in a Card and allowing you to make changes to both. In both cases, you can start from scratch or you can load an existing object or foreground to work with. Modifications do not affect the main dataset until you issue a Save Object or Save Foreground command. As with all edit commands, for these changes to be recorded in a dataset file you also need to use the Save File command.

The single edit window includes command buttons for adding and deleting spots and lines, and you can also directly interact with such items to move or resize them - see RV2's Buttons.

Additional notes:

When you load an object into the single edit window you also load the foreground associated with that object. When you clear an object you also clear the foreground.

If an edited foreground is saved so as to overwrite the existing entry (i.e. not to a new name) then all objects which previously used this foreground will henceforth use the modified one. If a foreground is saved as a new entry then these same objects will not be affected. Indeed even the object in the single edit window will not be affected unless it is saved after the modified foreground is saved.

Note that some operations, such as attribute addition and removal, can be achieved using single or multiple commands.

Creating Datasets

Unlike a large number of Windows programs, *RV2* doesn't use a Multiple Document Interface (MDI). This means that you only ever work on one dataset at a time and if you want to start work on a new dataset, you simply Clear the current one.

Whether you're starting a new dataset or adding objects to an existing one, you create each new object in the **Single Edit** window - it's here that you might load an external document or image, add some anotation or links, and assign the whole thing some attributes. (See Editing for more comments on the way the Single Edit window works or Single Edit commands for a list of the available options.)

Alternatively, you can import objects from another application into *RV2* in comma delimited format using the standard Open or Append commands. Each record (row) in the imported file becomes a new object; each field becomes an attribute. (See Dataset File Formats.)

Primary & Secondary Attributes

Situations will arise where irrelevant attribute names appear in the Filter dialogue and their inclusion can make finding the right name a slower process for the user. For example, in a dataset of people you are unlikely to want to use their fax number as a search criterion.

The solution in *RV2* is to relegate such attribute names to a **secondary** list and to restrict the list presented in a Filter to the remaining (**primary**) names. Attribute names can easily be moved between the two lists by using the Attributes - Secondary **Edit** command.

Note that you can force *RV2* to display all names by checking the Show Secondary Entries **Options** command and also that, if the **primary** list is empty, all names will again be displayed.

All attribute names occur in one (and only one) of the two lists.

Text Control

The text component of each spot in a foreground can be individually formatted or can adopt a set of default text properties which have been defined for use throughout a particular dataset (see Text Defaults).

There are two types of controllable text properties. There are 5 simple 'on/off' properties controlled by checkboxes. Note that switching on one of these options as a text default will overrule any individual spot setting.

Bold, **Italic** & **Underline**

In circumstances where an object has several values of one attribute, the choice of using a **New line** for each new value or of simply separating values by commas.

An option to include a symbol in the corner of spots to **indicate text overflow** beyond the available area of the spot.

There are also some properties for which you have to select from a list of values. When setting one of these for an individual spot, the list of options also includes 'Use Default'.

Alignment - Left/Centre/Right.

Size - height from 1 to 127; note that for vector images this is a notional size based on full screen display and that characters size will vary with zoom operations and changes in window size (see Background File Types).

Colour - one of 7 preset values. Note that 3 separate default colours can be defined: in addition to the default colour for 'normal' text, different colours can be specified for the display of current (!) and blackboard (?) attribute data (see Displaying Attribute Values).

Text settings are applied to the whole of the text for a particular spot - there is currently no provision for variation of settings within one spot's text..

File commands

- Open
- Append
- Clear
- Restart
- Save
- Save As...
- Print
- Print Setup
- Export
- Summary Information
- Exit
- Previous files (1-4)

Search commands

These commands appear in the **Search** window's menu. Use the **Show Search** command in the main menu to display the **Search** window or to bring it to the front of the display.

Single Edit commands

These commands appear in the menu of the Single Edit window. Use the **Edit, Single Edit** command in the main menu to open the **Single Edit** window or to bring it to the front of the display. Note that you can also use the F2 key as a short-cut to open the Single Edit window and then load the current selection from the Search List.

Close

Object, Load
Object, Clear
Object, Save

Foreground, Load
Foreground, Clear
Foreground, Save

Background, Load
Background, Clear
Background, Edit
Background, Type

Attributes

Snap

See Editing for a summary of the differences between **Single Edit** and **Multiple Edit** commands.

Edit commands

The **Edit** menu includes several groups of commands. The first command causes the Single Edit window to be opened, thereby providing the user with access to all the Single Edit Commands. The remaining commands, listed below, provide general editing control and, in most instances, can be used to perform operations on many objects at once. They are therefore frequently referred to here as **Multiple Edit** commands.

Objects Delete
Objects Set as Starter

Foregrounds Load
Foregrounds Clear
Foregrounds Delete

Backgrounds Load
Backgrounds Clear

Attributes Add
Attributes Remove
Attributes Edit Name
Attributes Edit Value
Attributes Secondary
Attributes Use as Description
Attributes Delete All Spares

See Editing for a summary of the differences between **Single Edit** and **Multiple Edit** commands.

Options commands

Help commands

Open File (File option in main window menu).

Used to load an existing dataset file into *RV2* via a standard Windows dialogue box.

Two types of file can currently be loaded: standard *RV2* datasets (either Binary or ASCII) with a **.RIX** extension and comma-delimited ('flat') files with a **.CDF** extension (see Dataset File Formats).

The current dataset, blackboard and foregrounds will be cleared from *RV2* prior to loading the selected dataset but you will first be notified of any unsaved changes to the objects or foregrounds and given the chance to save them.

Append File (File option in main window menu).

Used to merge additional dataset files with the data currently in use. The resulting data will include all of the individual objects and foregrounds from the separate datasets but *RV2* will check for and merge any common attribute names.

Two types of file can currently be loaded: standard *RV2* datasets (either binary or ASCII) with a **.RIX** extension and comma-delimited ('flat') files with a **.CDF** extension (see Dataset File Formats).

Clear File (File option in main window menu).

Used to clear the current dataset, blackboard and foregrounds from *RV2* prior to creating a new dataset. You will be notified of any unsaved changes to the objects or foregrounds and given the chance to save these.

Restart File (File option in main window menu).

Used to return the current dataset to its initial display state, removing any filters or queries which are in force, closing cards, and redisplaying the starter card if one has been specified.

Save File (File option in main window menu).

Saves the current data to an *RV2* binary dataset file with a **.RIX** extension (regardless of which file type the data was loaded from). (See Dataset File Formats.)

The saved data is not restricted to those objects which are currently displayed in the Search List - all the objects and foregrounds in the current data set will be saved. Every attribute value will also be saved, regardless of whether it is used by any objects. Use the Delete All Spares command if you want to remove these pairs before saving.

As with most Windows programs, if *RV2* doesn't have a current dataset file name the user will be asked to specify a name and directory using a standard **'Save As'** dialogue box. The current file name, if one exists, is displayed in the title bar of the main window in *RV2*. Use the Save As... menu option if you want to save the data to a different filename.

Whenever a **Save** operation threatens to overwrite an existing file, a copy of the original data is created in a file with a **.BAK** extension.

Save File As... (File option in main window menu).

Used to save the current data to an *RV2* binary dataset file with a new name supplied by you in a standard **'Save As'** dialogue box.

The saved data is not restricted to those objects which are currently displayed in the Search List - all the objects and foregrounds in the current data set will be saved. Every attribute value will also be saved, regardless of whether it is used by any objects. Use the Delete All Spares command if you want to remove these pairs before saving.

Whenever a **Save As** operation threatens to overwrite an existing file you are warned of the potential clash. If you proceed a copy of the original data will be created in a file with a **.BAK** extension.

Also see Save, Dataset File Formats.

Print File (File option in main window menu).

Used to output a selected combination of object and attribute data to a printer in one of three predefined report formats. (The process for specifying your output requirements is almost identical to that used with File, Export.) The **Dataset Print Options** dialogue allows you to:

select individual **attributes** to be output - these can include the Description and Background name

specify the **objects** to be output - a choice between the complete dataset and the current contents of the Search List

include attribute **names** in the output (typically as column headings)

select a **report** format (for a description of these see Export & Print Formats)

After specifying these options you will see a standard **Print** dialogue with options for modifying the printer setup prior to output.

Print Setup (File option in main window menu).

This gives you access to the standard Windows **Print Setup** dialogue where you can select a target printer, paper size and orientation and options which are specific to your chosen printer. These options will then be in force when you issue a File, Print command or click on the **Print** button in the Summary Information dialogue.

Export File (File option in main window menu).

Used to output a selected combination of object and attribute data to a file in one of four predefined report formats. (The process for specifying your output requirements is almost identical to that used with File, Print.) The **Export Options** dialogue allows you to:

select individual **attributes** to be output - these can include the Description and Background name

specify the **objects** to be output - a choice between the complete dataset and the current contents of the Search List

include attribute **names** in the output (typically as column headings)

select a **report** format (for a description of these see Export & Print Formats)

After specifying these options you will see a standard file selection dialogue with which you can specify the name of the file to be created.

Summary Information (File option in main window menu).

This option displays the name of the **current dataset file** (i.e. that to which the data would, by default, be saved), the **current path**, the **default dataset path** (see Background File Paths) and some statistics about the current dataset which give some indication of the nature of the data you are working with. These include:

- **#1** the total number of objects
- **#2** the number of objects in the Search List
- **#3** the total number of foregrounds
- **#4** the total number of attribute names
- **#5** the total number of attribute values
- **#6** the total number of attribute pairs (i.e. different combinations of names and values)
- **#7** the total number of list nodes
- **#8** 'Value use' - the average number of times that a value is used in different pairs
- **#9** 'Objs/pair' - the average number of objects using each pair
- **#10** 'Pairs/obj' - the average number of pairs associated with each object

Notes (also see Objects and Attributes):

#6 will always be at least as great as **#5**. The difference between the two indicates the degree to which a value can be used with more than one name. This is also expressed as a ratio in **#8**.

#7 is included solely for development purposes - its significance will not be discussed here !

#9 gives an indication of the level of attribute reuse amongst objects. A value of 1 means that every object has a set of unique attributes.

#10 shows how extensively attributes have been applied to the data. Comparison of this value with **#4** - the total number of names available - gives an indication of the diversity of object types in a dataset (since different object types will probably make use of different sets of attribute names). However, **#10** can be greater than **#4**, since an object can have more than one value paired with the same name.

Note that you can print a copy of the information displayed in this dialogue via the **Print** button.

Exit (File option in main window menu).

Ends the *RV2* session. You will first be notified of any unsaved changes and given the chance to save them.

The same result can achieved by selecting the **Close** option from the control menu or by using the ALT and F4 keys together when the focus is on the main *RV2* window.

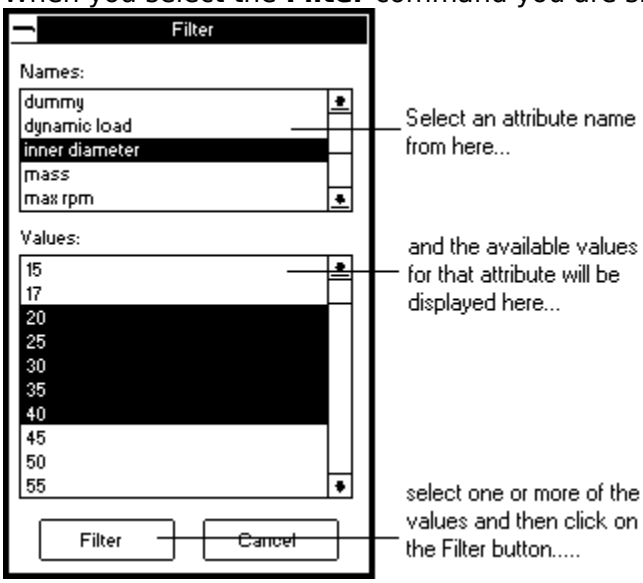
Previous files (1-4) (File option in main window menu).

Used to discard the current dataset and reload one of the last four to be used. These options are therefore absent when *RV2* is first installed on a system.

See also Open File, Dataset File Formats.

Filter (option in Search window menu).

When you select the **Filter** command you are shown a dialogue box:



The filter searches the current Search List for objects having at least one of the attribute values which you selected in the box. It then reduces the Search List to include just these matching objects. If you only select one value in the box then the filter is equivalent to issuing a simple, one stage **name=value** query. If you select several values then the filter action is equivalent to a query involving multiple union operations, i.e.

"inner diameter"=20 OR "inner diameter"=25 OR "inner diameter"=30 OR etc...

This may look complicated but in fact the filter is doing exactly what you would expect it to do - it just finds anything which has a value in the highlighted range. For more complex searches you need to use the Query command.

Filters always act on the current Search List so you can keep applying filters to reduce the list incrementally. Individual filter operations can be reversed using the Undo command. To remove all filters and queries use the Reset command.

A filter should never fail to find at least one object which has your selected attribute value. This is because the attribute names and values presented to you for selection in the **Filter** dialogue box are restricted to those which are still relevant to the current Search List. Hence, as you apply a series of filters you will see that the range of options being shown to you is gradually reduced (see Reduced Search Space).

Additional notes:

To select multiple entries from a list box use the normal Windows techniques.

Filters can also be used to search for objects having a specific description or associated with a specific foreground or background. Thus **_description**, **_foreground** and **_background** will appear at the top of the list of attribute names when appropriate (see Fixed Attributes).

Undo (option in Search window menu).

This option reverses the action of the last Filter or Query which was applied to the Search List. Hence if a cumulative series of Filters have been applied to the Search List then these can be individually undone allowing you to 'step back' through the series.

Reset (option in Search window menu).

This option removes the effect of every Filter or Query which has been applied to the Search List and restores every object to the list (i.e. if a cumulative series of Filters have been applied to the Search List then these are all undone in a single operation).

Query (option in Search window menu).

This options allows you to search the current Search List using potentially complex query expressions. It then reduces the Search List to include just those objects matching the query.

The query dialogue includes a check box labelled **'apply to current list'** which is normally checked. If you uncheck this option then all objects in the current data will be searched irrespective of the contents of the Search List.

For a detailed description of the rules governing query construction see Query Syntax.

As with a Filter, a query always acts on the current Search List so you can use several queries to reduce the list incrementally. Individual query operations can be reversed using the Undo command. To remove all filters and queries use the Reset command.

Note that unlike a filter, which uses an interactive method of searching and a Reduced Search Space technique to ensure that you always find a match, it is possible for a query to result in an empty Search List.

Hide Search (option in Search window menu).

This hides the Search window but does not affect the contents of the Search List. You can restore the window by using the **Show Search** command in the main *RV2* menu.

Load Object (Object option in Single Edit window menu.)

This allows you to select an object from those that appear in the Search List and to load all the data relating to that object - attributes, description, foreground and background - into the Single Edit window. The object will also be displayed in this window in much the same way as it would be shown in a card window. (The only differences being the possible inclusion of a snap grid and the delineation of spots with dotted grey boundaries - see Snap and Spot Types.)

Any data which is already loaded in the Single Edit window will be discarded but you will be prompted to save any changes which have been made either to the object or to the foreground.

If the object which you want to edit does not appear in the Search List then you will need to issue an Undo or Reset command before trying to use **Load Object**.

You can shortcut this operation by using the F2 key - the currently selected object in the Search List will immediately be loaded into the Single Edit window (and the window itself will be created if it does not already exist).

Other related commands: Clear Object and Save Object.

Clear Object (Object option in Single Edit window menu).

This discards any object data - attributes, description, foreground or background - which has been loaded into or created in the Single Edit window. You will be prompted to save any changes which have been made either to the object or to the foreground.

Other related commands: Load Object and Save Object.

Save Object (Object option in Single Edit window menu).

This saves the current object data - attributes, description, foreground name or background - from the Single Edit window to the main dataset. When using this command you are asked to supply a description and, if you started from an existing object, given the choice of overwriting that object or of creating a new one (via the **New entry** check box).

Notes

This command only modifies the object data which is being used for the current session. To make permanent changes to the dataset file you will also need to use the Save File command.

Similarly, this option can be used to modify the assignment of a foreground to an object but **not** to record modifications to a particular foreground. For the latter you need to use the Save Foreground command.

Other related commands: Load Object and Clear Object.

Load Foreground (Single) (Foreground option in Single Edit window menu).

This allows you to superimpose an existing foreground on the current object in the Single Edit window. If another foreground is already associated with the object then this will be discarded but you will be prompted to save any changes which have been made to it.

To update the main dataset, the change of foreground must be recorded by using the Save Object command. (This step is not necessary with the Multiple Edit version of this command.)

Note that each foreground has been created to be displayed with a particular type of background and that loading a foreground onto the wrong type of background can produce problems of dissimilar scaling.

Other related commands: Clear Foreground and Save Foreground.

Clear Foreground (Single) (Foreground option in Single Edit window menu).

This discards the foreground currently associated with the object in the Single Edit window. You will be prompted to save any changes which have been made to the foreground.

To update the main dataset, this action of removing the foreground must be recorded by using the Save Object command. (This step is not necessary with the Multiple Edit version of this command.)

Other related commands: Load Foreground and Save Foreground.

Save Foreground (Foreground option in Single Edit window menu).

This option allows you to record in the main dataset any changes which have been made to the foreground in the Single Edit window. When using this command you are asked to supply a foreground name and, if you started from an existing foreground, given the choice of overwriting that foreground or of creating a new foreground (via the **New entry** check box).

If the **overwrite** option is used then all the objects which were previously associated with this foreground will remain associated with it (in its modified form). If the foreground is saved as a **new** entry then the previous foreground, and hence all those objects which used it, will be unaffected. Indeed even the object currently in the Single Edit window will not incorporate these foreground changes until the Save Object command is also used.

Other related commands: Load Foreground and Clear Foreground.

Load Background (Single) (Background option in Single Edit window menu).

This allows you to associate an external ('background') file with the current object and to display it in the Single Edit window. If another background is already associated with the object then this will be discarded.

File selection is achieved via a standard Windows dialogue box which includes extension filters to help identify particular types of file (e.g. ***.BMP** to list just Windows bitmaps). Once you have selected a file, *RV2* will attempt to determine its type simply from the file extension. You may then be shown a list of file types and given the opportunity to confirm *RV2*'s choice of type or to specify a different one (see Background File Types).

To update the main dataset, the change of background must be recorded by using the Save Object command. (This step is not necessary with the Multiple Edit version of this command.)

Note that foregrounds are created to be displayed with a particular type of background and that loading a new background may lead to problems of dissimilar scaling.

Also note that, except when displaying vector background files, you can scroll up and to the left of the standard display area in the Single Edit window and then draw spots or lines in this newly revealed area. When you display the resulting combination in a card the origin of the display will be shifted so as to fit in these new items. You can therefore use this technique to create extra 'margin' space at the left or top of a text file or bitmap.

Other related commands: Clear Background, Edit Background and Type Background.

Clear Background (Single) (Background option in Single Edit window menu).

This discards the background currently associated with the object in the Single Edit window.

To update the main dataset, this action of removing the background must be recorded by using the Save Object command. (This step is not necessary with the Multiple Edit version of this command.)

Note that foregrounds are created to be displayed with a particular type of background and that removing a background may lead to problems of incorrect scaling.

Other related commands: Load Background, Edit Background and Type Background.

Edit Background (Background option in Single Edit window menu).

This option will attempt to launch an application with which you can modify the contents of the background file. The response will therefore depend on the background's type. For example, if the background is an ASCII file, *RV2* might run the Windows 'Notepad' text editor (see Background File Types).

The response will also depend on the Windows configuration of your PC and the software available to you. You will find, of course, that some files cannot be edited - perhaps you don't have suitable access rights or the file originated from a program on another machine or the file is an executable program. Ultimately, control over the contents of a background file is not part of *RV2*'s intended scope; *RV2* just gives you a chance to view the file within an consistent, integrated environment.

Other related commands: Load Background, Clear Background and Type Background.

Type Background (Background option in Single Edit window menu).

Use this command to specify a different file type for the background which is currently associated with the Single Edit window. You will be shown a list of recognised file types with *RV2*'s guess at the file type highlighted (see Background File Types).

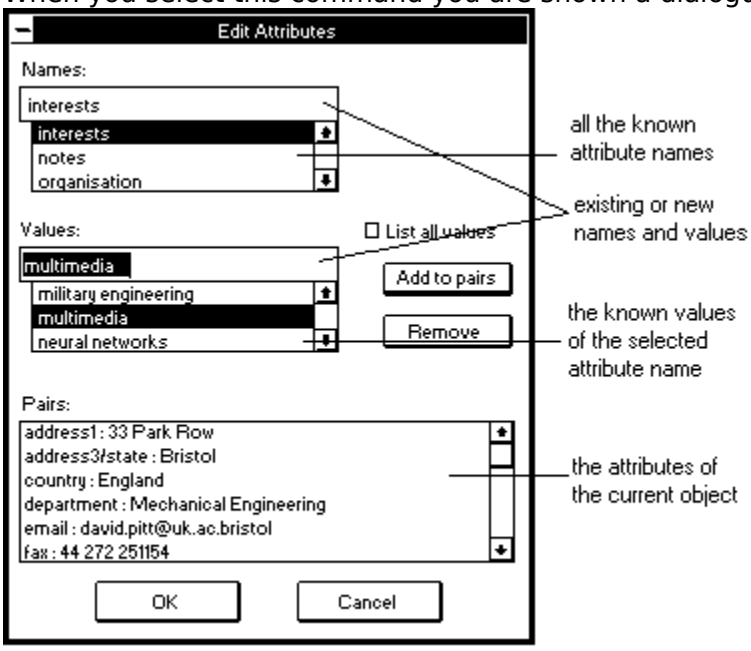
To update the main dataset, the change of background type must be recorded by using the Save Object command.

Note that some foregrounds are created to be displayed with a particular type of background and that changing the background type may lead to problems of dissimilar scaling.

Other related commands: Load Background, Clear Background and Edit Background.

Attributes (option in Single Edit window menu).

When you select this command you are shown a dialogue box:



The **Pairs** list box shows the current attributes of the object which you are editing in the Single Edit window. To remove an attribute from this object simply select the entry in **Pairs** and click on **Remove**. To add an attribute:

1. Select or create an attribute name in the **Names** box.
2. Select or create an attribute value in the **Values** box
3. Click on the **Add** button.

After making any changes to the list shown in the Pairs box, update the object using the **OK** button. To update the main dataset, these changes must be recorded using the Save Object command. The attributes of one or more objects can also be altered using the Add Attribute and Remove Attribute options in the **Edit Multiple** section of the main menu.

Note that the **Names** and **Values** boxes include all known attributes, including those which are no longer used by any objects (see Delete unused pairs). If the **List All Values** checkbox is empty only known values of the specified name will be listed.

Snap (option in Single Edit window menu).

Use this to superimpose a grid on the display area of the Single Edit window. Whenever you draw, move or resize a spot, the spot's corner will be shifted ('snapped') to the nearest point on this grid.

The menu sub-options (1 5 10 15 ...) refer to the grid spacing in pixels which will be used. To switch the snap mechanism off use a spacing of 1.

Objects - Delete (Edit option in main window menu).

Use this command (**with care!**) to remove objects from the dataset. Object selection is via the standard Multiple Object dialogue. Foregrounds and unused attributes will not be removed. Cards displaying deleted objects will be closed.

Objects - Set Starter (Edit option in main window menu).

Specifies which object will be automatically displayed each time the dataset is loaded. This object is known as the **Starter Object** (see Datasets). You are shown a list of objects from which to make your selection - if you don't want a starter, select the None option at this stage.

Foregrounds - Load (Multiple) (Edit option in main window menu).

This allows you to superimpose an existing foreground on several objects. If another foreground is already associated with any of the objects then it will be discarded.

You are first asked to specify one or more objects using the standard Multiple Object dialogue and then to select a foreground from a second dialogue.

Note that each foreground has been created to be displayed with a particular type of background and that loading a foreground onto the wrong type of background can produce problems of dissimilar scaling.

Other related commands: Load Foreground (single edit version) and Clear Foreground.

Foregrounds - Clear (Multiple) (Edit option in main window menu).

This discards the foreground currently associated with one or more objects which have been specified by you using the Multiple Object dialogue.

Other related commands: Load Foreground and Clear Foreground (single edit version).

Foregrounds - Delete (Edit option in main window menu).

Removes all record of the selected foreground(s) from the dataset. If an object uses the selected foreground then the latter will be cleared from the object; no checks are made to determine whether the foreground is used.

Backgrounds - Load (Multiple) (Edit option in main window menu).

This allows you to associate an external ('background') file with several objects. If another background is already associated with any of the objects then it will be discarded.

You are first asked to specify one or more objects using the standard Multiple Object dialogue and then to select a background file via a standard Windows dialogue box which includes extension filters to help identify particular types of file (e.g. ***.BMP** to list just Windows bitmaps). Once you have selected a file, *RV2* will attempt to determine its type simply from the file extension. You may then be shown a list of file types and given the opportunity to confirm *RV2*'s choice of type or to specify a different one (see Background File Types).

Note that foregrounds are created to be displayed with a particular type of background and that loading a new background may lead to problems of dissimilar scaling.

Other related commands: Load Background (single edit version) and Clear Background.

Backgrounds - Clear (Multiple) (Edit option in main window menu).

This discards the background currently associated with one or more objects which have been specified by you using the Multiple Object dialogue.

Note that foregrounds are created to be displayed with a particular type of background and that removing a background may lead to problems of incorrect scaling.

Other related commands: Load Background and Clear Background (single edit version).

Attributes - Add (Edit option in main window menu).

This allows you to add **one** attribute pair to one or more objects (c.f. the Attributes command in the Single Edit window, which allows you to add one or more attributes to a single object). Attributes which are currently on display within foreground text are immediately updated.

You are first asked to specify one or more objects using the standard Multiple Object dialogue and then to select or create an attribute pair using a process similar to that used in the Single Edit Attributes dialogue box. i.e.

1. Select or create an attribute name in the **Names** box.
2. Select or create an attribute value in the **Values** box.
3. Click on the **Add** button.

Note that the **Names** and **Values** boxes include all known attributes, including those which are no longer used by any objects (see Delete All Spares). If the **List All Values** checkbox is empty only known values of the specified name will be listed.

See also Attributes - Remove.

Attributes - Remove (Edit option in main window menu).

This allows you to remove **one** attribute pair from one or more objects (c.f. the Attributes command in the Single Edit window, which allows you to remove one or more attributes from a single object). Attributes which are currently on display within foreground text are immediately updated.

You are first asked to specify one or more objects using the standard Multiple Object dialogue and then to select an existing attribute via two list boxes (labelled **Names** and **Values**).

Note that only those attributes which are used in the current Search List are included in the **Names** and **Values** boxes. Hence the dialogue and selection process are quite similar to those used in the Filter process but only allow single value selection.

You should also note that it is possible to specify attributes for removal from objects which didn't have them. If you want to remove all instances of a particular attribute value you do not need to identify the relevant objects first. Just make sure that you select a group of objects which **includes** all the relevant ones.

See also Attributes - Add.

Attributes - Edit Name (Edit option in main window menu).

This command allows you to modify the name of an attribute throughout the dataset without losing any data which is associated with that attribute. The use of the attribute by one or more objects is not affected - only the text is changed (see Objects and Attributes).

For example an attribute name, **OD**, might be edited with this command so that it became **Outer Diameter**. All instances of use of this attribute by objects are directly overwritten: **OD=40** simply becomes **Outer Diameter=40**. Clearly this option is very useful when you wish to make the names used by a dataset more convenient, consistent or descriptive.

The name editing dialogue includes an **Update foreground** which when checked will cause all instances of the attribute name in foregrounds (either as displayed or link text) to also be modified. Unchecking of this option is not normally recommended.

A particularly powerful feature of this command is the ability to merge two sets of attributes: if your modified version of an attribute name (e.g. **Outer Diameter**) already exists in your dataset as a separate attribute then you are prompted either to cancel the editing operation or to treat the two names as one. Thus a dataset drawn from several sources might include inconsistent terminology (the use of **OD** for some objects and **Outer Diameter** for others) which you can unify within a single attribute.

A similar command - Attributes - Edit Value - exists for making wholesale changes to an attribute value.

Attributes - Edit Value (Edit option in main window menu).

This command allows you to modify an attribute value throughout the dataset without losing any data which is associated with that attribute. The use of the attribute by one or more objects is not affected - only the text is changed (see Objects and Attributes).

The command can be used in two ways. You can either modify all occurrences of a particular name:value combination, for example changing **City=Cologne** to **City=Koln**; everywhere it is used. Alternatively, you can change every instance of the value, regardless of attribute name. For example, correcting a spelling mistake (**Cosner** to **Costner**) everwhere it might occur (**Actor=Cosner**, **Director=Cosner** , **President=Cosner** etc..).

The **Edit Value** dialogue expects you to select an attribute name in order to identify a particular value. However, the modification will affect all instance is you check the Replace this value for ALL names option.

The process also allows you to merge two sets of attributes: if, in the previous example, the data originally included examples of both spelling (**Cosner** and **Costner**) the edit option would simply combine them as a single value (see Objects and Attributes).

A similar command - Attributes - Edit Name - exists for making wholesale changes to an attribute name.

Attributes - Secondary (Edit option in main window menu).

Only **primary** attribute names are normally listed in the Filter dialogue. This command allows you to determine which attribute names should be stored in the primary and secondary attribute lists (see Primary & Secondary Attributes) and hence displayed in the Filter.

To move entries form the primary to the secondary list, highlight the corresponding listbox entries and click on the **To secondary** button. To reverse the process use the lower listbox and the **To primary** button.

Note that you can force *RV2* to display all names by checking the Show Secondary Entries **Options** command and also that, if the **primary** list is empty, all names will again be displayed.

Attributes - Use as Description (Edit option in main window menu).

This option allows you to choose one attribute **name** and then use the **value** of that attribute as the description for one or more objects. The point of being able to do this is so that you can quickly create descriptions for a number of objects using a convenient existing value rather by entering a lot of new and individual descriptions.

Thus you might be working with a dataset file which was created somewhere other than in *RV2* and loaded, for example, as a comma-delimited file (see Dataset File Formats). By default in these circumstances *RV2* will use as the object description the first attribute that it encounters. You can use this command to select a more appropriate attribute - one which is widely used but which typically takes a unique (or nearly unique) value for each object.

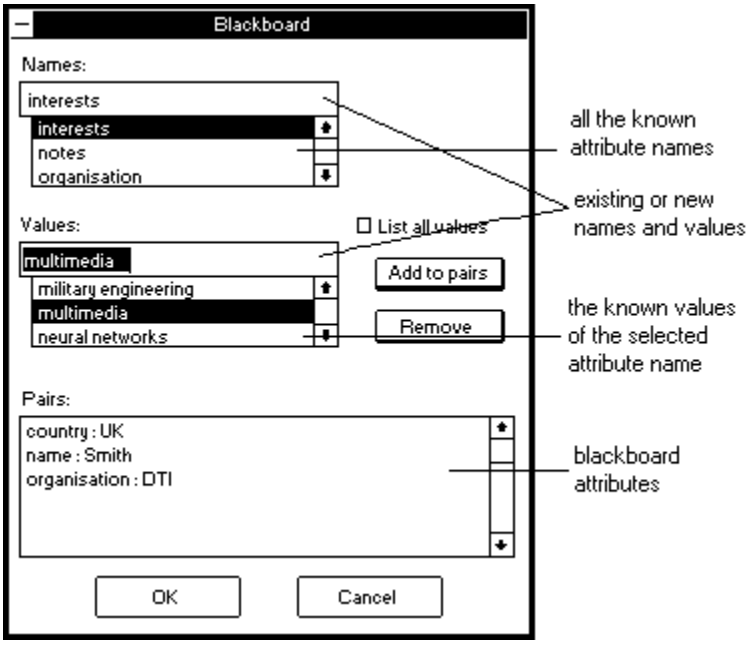
You are first asked to specify one or more objects using the standard Multiple Object dialogue and then to select from a list of existing attribute names. The command will have no effect for objects which have no value of the specified attribute. Where objects have multiple values of an attribute, the first value is used.

Attributes - Delete All Spares (Edit option in main window menu).

This command allows you to enforce deletion of any attribute combinations (names and/or values) which are not used by any object in the dataset nor stored by the Blackboard. The process is entirely controlled by *RV2* - you will not be prompted to select particular attributes for deletion and the only evidence of changes to the dataset will be reductions in the contents of the Attributes and Attributes - Add dialogue boxes.

Blackboard Command (Main window command).

This command opens a dialogue box which is visually and functionally identical to that used for the Attributes dialogue, except that, whereas that one allows you to modify the attributes of an object in the Single Edit window, this directly modifies the contents of the Blackboard.



Thus, the **Pairs** list box shows the current contents of the blackboard. To remove an attribute simply select the entry in **Pairs** and click on **Remove**. To add an attribute:

1. Select or create an attribute name in the **Names** box.
2. Select or create an attribute value in the **Values** box.
3. Click on the **Add** button.

Note that the **Names** and **Values** boxes include all known attributes, including those which are no longer used by any objects (see Delete All Spares).

Case Sensitive (Options command in main window menu).

RV2 normally starts with this option ticked to show that queries will be case dependent. By deactivating this option you can apply queries in which case is ignored (see Query Syntax).

Note that when you save a file the state of every entry in the **Options** menu is saved with it and restored when that file is loaded.

Show Backgrounds (Options command in main window menu).

RV2 normally starts with this option ticked. If this option is selected (so as to remove the tick) then display of an object within a card will not include the assigned background. The background of each card is reinstated when the option is reselected.

This does not affect the Single Edit window where, if a background is specified, it will always be shown.

To interrupt the display of a background (in a card or the single edit window) press the **Esc** key. As long as any scaling information has not been inadvertently ignored, the foreground will still be displayed as usual.

Also see Show Object, Show Foregrounds.

Note that when you save a file the state of every entry in the **Options** menu is saved with it and restored when that file is loaded.

Show Foregrounds (Options command in main window menu).

RV2 normally starts with this option ticked. If this option is selected (so as to remove the tick) then display of an object within a card will not include the assigned foreground. The foreground of each card is reinstated when the option is reselected.

This does not affect the Single Edit window where, if a foreground is specified or created, it will always be shown.

Also see Show Object, Show Backgrounds.

Note that when you save a file the state of every entry in the **Options** menu is saved with it and restored when that file is loaded.

Show Secondary Entries (Options command in main window menu).

When this option is disabled, the list of attribute names appearing in the Filter dialogue is restricted to those present in the primary attribute list (see Primary & Secondary Attributes). If this option is enabled, or if the primary attribute list is empty then the contents of the Filter dialogue are unrestricted.

To modify the contents of the primary attribute list use Attributes - Secondary.

Note that when you save a file the state of every entry in the **Options** menu is saved with it and restored when that file is loaded.

Confirm Multiple Edits (Options command in main window menu).

When this menu option is enabled you will be asked to confirm any Multiple Edit command before it is processed. (For a list of the relevant commands see Edit commands.)

Note that when you save a file the state of every entry in the **Options** menu is saved with it and restored when that file is loaded.

Text Defaults (Options command in main window menu).

This option allows you to set default properties for all the text displayed in foregrounds in the current dataset (size, bold/italic/underline, alignment, etc.. - for a detailed description of the controllable text properties see Text Control).

The default properties are used in the absence of any specific formatting information for an individual foreground spot. Moreover if one of the default checkbox options (Bold, Italic, Underline, New line, Indicate overflow...) has been checked then it will be imposed for all spots. Also note that in addition to default colours for 'normal' text, different colours can be specified for the default display of current (!) and blackboard (?) attribute data (also see Displaying Attribute Values).

Note that when you save a file the state of every entry in the **Options** menu is saved with it and restored when that file is loaded.

Contents Command (Help option in main window menu).

Use this command from *RV2* to display the **Contents** page of this **Help** system. Once into **Help** you can return to the **Contents** page at any time by clicking on the first of the buttons above.

Search for Help On... Command (Help option in main window menu).

This option takes you directly to the **Windows Help** search system and shows you a list of the keywords and phrases which have been used to locate *RV2* **Help** topics. Once into **Help** you can return to the search system at any time by clicking on the second of the buttons above.

How to Use Help Command (Help option in main window menu).

This command will load the standard **Windows 'How to Use Help'** topics which provide common guidance for interacting with any **Help** files - the meaning of the buttons above, how to browse, search, print, and so on. This can also be accessed through the **Help** menu option above.

About RV2... Command (Help option in main window menu).

Use this command to display a dialogue box containing basic information about the program which you are running (version number, copyright, contacts). This same dialogue box is displayed each time you start the *RV2* program.

Operations

Starting and Finishing *RV2*

As usual with Windows applications, you can run *RV2* by using the **File Run** command in the Program Manager or the File Manager, or by creating an entry (as an **icon**) in one of your Program Manager groups and then running by clicking on the icon. You will need to specify the path of the *RV2* files in your command line unless they are in a directory which you've listed in your **PATH** entry in **AUTOEXEC.BAT**.

Note that you can specify a dataset file in your command line - this dataset will be loaded when *RV2* starts (also see File, Open). This has a couple of implications:

You can associate **.RIX** files with *RV2* (using the **File Associate** command in the File Manager) and then just double click on the name of the dataset in File Manager to start *RV2* with this dataset loaded.

You can create Program Manager entries (icons) for specific dataset files - again *RV2* will start with the dataset loaded.

To **automatically display** a specified object when a dataset is loaded use the Edit, Set Starter command.

To **finish** use the File, Exit command in *RV2*'s main menu.

Loading Data from Files

To **load** a dataset use the File, Open command . You can also reopen the dataset which was open prior to the current one using the list of Previous files.

To **merge** data from files with that currently held in *RV2* use the File, Append command.

To **clear** data currently held in *RV2* use File, Clear.

To **automatically display** a specified object when a dataset is loaded use the Edit, Set Starter command.

For notes on loading dataset files when starting *RV2* see Starting and Finishing RV2 .

For notes on loading **background** data (documents, plots, bitmaps, etc.) see Editing Backgrounds.

Also see Datasets, Dataset File Formats.

Interacting with Objects

To show a **list** of the objects which can currently be displayed use the **Show Search** command (see Search commands). Use Hide to remove the list from view.

To display a selected **object** in a card use 

.

To toggle foreground and background displays on and off use Show Foregrounds and Show Backgrounds.
To **interrupt** the display of a background press the **Esc** key.

To **close** the card displaying an object use  .

To follow a **spot link** on a card just click with the left mouse button wherever the cursor shape changes to a hand (see Spots - linking). (Just like in this Help system.)

To **backtrack** to the previous object after a link use  .

To view a list of **attributes** of the displayed object use  .
To display an **adjacent** object in the list use  .
To **magnify** a portion of a vector display use  .
To **run** an executable background file  .

Also see Search List, Link Types, Stack.

Searching for Objects

Display the Search List using the **Show Search** command (see Search commands).

To **reduce** the list if it's too long, use the Filter command for a simple interactive search, or use the Query command to perform a more complex, expression-based search.

To **reverse** the effect of a filter or query use Undo.

To **restore all objects** currently held in *RV2* to the Search List use Reset.

To **restrict** the number of attribute **names** listed in a Filter use Edit, Attributes Secondary and disable Options, Show Secondary Entries

To make queries case-dependent use Options, Case Sensitive.

Also see Filters and Queries.

Editing Objects

Individual objects are created in the **Single Edit** window. Here you can assign to each object a background, foreground, attributes and description.

To **add an attribute** to an object use Attributes (in the **Single Edit** window) or Attributes - Add (in the main window under **Edit**). Note that these commands **create new attribute** names and values as required - no separate creation stage is need.

To **remove an attribute** from an object you can again use Attributes or Attributes - Remove.

To assign a **foreground** to an object use
Foreground, Load (Single) or
Foregrounds - Load.

To **remove** any **foreground** assignment use
Foreground, Clear (Single) or
Foregrounds - Clear.

Similarly there are 4 commands to assign a **background** to an object or to remove it:
Background, Load (Single)
Backgrounds - Load
Background, Clear (Single)
Backgrounds - Clear

Clearly all of the above **modifications** can be performed using either Single or Multiple commands and when the operation needs to be repeated for several objects the multiple option is preferable. However, to **create** new objects you must build them in the single edit window and then use Object, Save. Also use this command to change an object's **description** after using Object, Load to place the object in the single edit window. To start creating a fresh object use Object, Clear.

To create object **descriptions** from an existing attribute use Attributes - Use as Description in the **Edit** options.

To **remove objects** from the data in *RV2* use Objects - Delete in the **Edit** options.

To ensure that you are asked to **confirm** multiple editing operations before they are processed, check Confirm Multiple Edits in the **Options** menu.

For further discussion of the differences between Single and Multiple edit commands see Editing.

For other commands affecting attributes, see Editing Attributes.

For commands affecting the contents of a foreground, see Editing Foregrounds.

For commands affecting the display of a background, see Editing Backgrounds.

Also see Objects and Attributes.

Editing Attributes

Most commands governing attributes are discussed in Editing Objects but three options, all in the **Edit** menu, do not directly affect an object's attributes:

To modify an attribute **name** without affecting the existing use of that attribute by objects use Attribute - Edit Name. This command can also be used to **merge** two attribute names.

Similarly, to modify an attribute **value** without affecting the existing use of that attribute by objects use Attribute - Edit Value. This command can also be used to **merge** two attribute values.

To **delete** attribute names or values which are not assigned to any object use Attribute - Delete All Spares.

To ensure that you are asked to **confirm** these editing operations before they are processed, check Confirm Multiple Edits in the **Options** menu.

Also see Objects and Attributes.

Editing Foregrounds

To **remove** foregrounds from the currently held data use Foreground, Delete in the **Edit, Multiple** submenu.

All operations affecting the contents of foregrounds are listed below and are carried out in the **Single Edit** window - use Foreground, Load to load an existing foreground into the window, Foreground, Clear to remove existing spots before creating a new foreground and Foreground, Save, finally, to record any changes.

To superimpose a **snap grid** on the display area and constrain drawing operations to this grid, use Snap.

To **create** new spots or lines use  and then just draw.

To **modify** the **contents** of a spot, click on it (without moving the cursor) and work with the dialogue box which then appears (see Spot Dialogue Box).
To **modify** the **text format** of a particular spot, click on it while holding down the **Shift** key (see Text Control) or select the **Text Style** button in the Spot Dialogue Box.

To **modify** the **default text format** for all spots, select Text Defaults from the **Options** menu.

To **modify the position or size** of a spot or line simply drag and drop it with the cursor (see Spots - editing).

To **delete** a spot or line use  and then click on the element.

To update an apparently corrupted foreground display, try clicking with the right mouse button.

For commands affecting the assignment of foregrounds to objects, see Editing Objects.

Also see Foregrounds and Spots.

Editing Backgrounds

RV2 does not affect the contents of a background file - it simply allows you to assign a file to an object and to display it in a card.

To change the background's type, and hence the way it is displayed in a card use Background, Type.

To attempt to invoke an external application capable of editing the background's contents use Background, Edit.

Both of these commands are invoked from the **Single Edit** window.

For commands affecting the assignment of backgrounds to objects, see Editing Objects.

Also see Backgrounds.

Saving Changes

The process of saving changes to *RV2* data generally follows the standard approach of Windows applications, but note that changes made within the **Single Edit** window require an additional step before they are recorded in a dataset file....

To record, in a dataset file, general changes to the currently held data use File, Save.

To record these changes in a different file than that from which the data was loaded use File, Save As....

To update the currently held data to reflect **Single Edit** changes to an object use Object, Save. (You must then use **File, Save** to record these changes in a file).

To update the currently held data to reflect **Single Edit** changes to a foreground use Foreground, Save .

Also see Editing.

Extracting Data

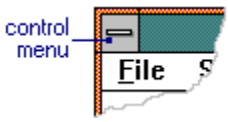
To export object and attribute data to a neutral file format use File, Export.

To print object and attribute data use File, Print.

To configure a printer prior to printing, use the conventional File, Print Setup option.

To copy the display contents of an individual card to the clipboard use  .

To retain attributes for use with a different dataset, place them in the Blackboard.
To display a summary of the current dataset - total objects, foregrounds, attributes, etc.. - use File, Summary Information.


control
menu
File


D:\EDIT\TEXT.RIX
Edit Status Help
title bar

To highlight a block of entries in a list box either:
a). click on this first entry in the block and then hold down the **Shift** key while clicking on the last entry, or...
b). drag the cursor across the block to be selected while holding the mouse button down.

To add or remove highlighting from individual entries hold down the **Ctrl** key while clicking on the each entry.

DefaultFont

bits 1-8	character size (1-127)
bits 9-11	text colour (1-7 presets*)
bit 12	bold
bit 13	italic
bit 14	underline
bits15-16	unused

e.g. 0x0210 = size 16; red; not bold; not italic; not underline.

(* 1=blue, 2= red, 3=green, 4=grey, 5=white, 6=black, 7=magenta)

DefaultLayout

bits 1-2	horizontal alignment (1=left, 2=centre, 3=right)
bits 3-4	multiple value handling (1=comma, 2=line break)
bits 5-6	text overflow handling (1=indicate, 2=don't indicate)

e.g. 0x0025 = left align; separate with commas; don't indicate overflow.

DefaultAColors

bits 1-4	current attribute text colour*
bits 1-8	blackboard attribute text colour

e.g. 0x0103 = blue for current attributes; green for blackboard values

(* 1=blue, 2= red, 3=green, 4=grey, 5=white, 6=black, 7=magenta)

Query Syntax

In addition to the interactive Filter method of searching, you can search for objects within a dataset using a 'traditional' query expression. These queries can be applied either through the Query command or via embedded query links from spots (see Link Types).

A *RV2* query is similar in format to the 'WHERE' component of an SQL query. It consists of one or more conditions, linked and modified by Boolean operators and nested within brackets where necessary. For example:

NOT(country=USA AND department="Metals Laboratory")

The admissible Boolean operators have optional forms:

AND, **and**, **&**
OR, **or**, **/**
NOT, **not**

Mixed case words (e.g. **And**) are not allowed. By default all queries are Case Sensitive.

Each condition contains an attribute name and value linked by an operator. If either 'half' of the condition (i.e. the name or the value) is a string containing spaces then the string should be enclosed in double quotes - as in the example above. The operator must be one of the following:

operator	meaning
=	is equal to
>	is greater than
<	is less than
>=	is greater than or equal to
<=	is less than or equal to
<>	is not equal to
LIKE, **like**	is like the string

The **LIKE** operator performs a string search using **%** as a wild card symbol at the start and/or end or the string (see LIKE for more details):

country LIKE "Eng%" or...
country LIKE "%land" or....
country LIKE "%la%"

Spaces between strings and operators are optional but note that the 'word' operators - **AND**, **OR**, **NOT**, **LIKE** - must be separated from the rest of a query by a space, double quote, or bracket.

Further query topics:

Query Type Handling - how *RV2* copes with integers, dates, strings, and so on.

Special Query Features **- you must** read this section to understand how the rules governing *RV2*'s Objects and Attributes can affect queries.

Contextual Queries - how to make queries adaptable to current conditions.

Fixed Attributes can also be used, with some restrictions, in queries.

Query Messages

Examples:

You'll probably find that most of the time you are working with simple queries, incorporating only one or two conditions, such as

department="Technical Publications"
age>21 AND age<=30
surname LIKE"Mil%"
"outer diameter"=60 AND mass<0.5

In more complex queries the usual precedence rules apply - a **NOT** operation will be evaluated before an **AND** operation which will be evaluated before an **OR** operation. If in doubt always include brackets. For example, to find the multimedia experts outside North America we would use

NOT(country=USA OR country=Canada)AND interests=multimedia

If we omit the brackets from this query then it will be interpreted as

NOT(country=USA) OR (country=Canada AND interests=multimedia)

Note that in all these queries we have included the minimum allowable number of spaces. The only mandatory spaces are those separating operator words (**AND**, **OR**, **LIKE**, **NOT**) from name or value strings, or those occurring within a name or value.

Similarly we have only included double quote marks where these are essential but we would recommend that you include them when specifying unusual names or values or if your query is causing an unexpected **Search syntax error** (see Query Messages and Query Type Handling).

LIKE

The **LIKE** operator is used for wild card string searching within queries - i.e. to find attribute values which include a specified combination of characters. The wild card symbol, **%**, can be used in one of three ways:

country LIKE "Eng%" or...
country LIKE "%land" or....
country LIKE "%gla%"

All of these conditions would find all objects for which the attribute **country** has the value **England**. The second condition would also find **Finland**, **New Zealand**, **Holland**, and so on.

The partial string must be enclosed in double quotes and the wild card symbol must only be placed at the ends of the string. The wild card symbol can only be used with **LIKE**. Thus the following are all inadmissible:

country LIKE "E%land"
country LIKE Eng%
country = "Eng%"

Query Type Handling

Attributes are not explicitly classified as being of a particular type (such as integer, string, date, real number) but *RV2* makes its own assessments of attribute type when ordering values in a list box or when processing a query. For query purposes the following rules apply:

A **string** is anything which is enclosed in double quotes or which starts with a letter or with an underscore (**"neural nets"**, **RS200**, **_systems**, **"Henry Smith"**, **R.D.B.M.S.**, **"10 Downing St."**).

A **date** must be written DD-MM-YY, i.e. as three sets of 2 digit integers separated by minus signs (**04-07-76**); no other format is recognised.

A **real** (floating point) number starts with a digit or **+** or **-**, includes a full stop (decimal point), and is otherwise composed solely of digits (**0.45**, **-4.3**). The full stop must be preceded by a digit.

An **integer** starts with a digit or + or - and is otherwise composed solely of digits (**+21**, **135**, **-4**).

The following will produce incorrect results or error messages (see Query Messages):

200SC	(strings starting with digits should be enclosed in quotes)
John Jones	(spaces in string - enclose in quotes)
10/03/65	(wrong date format)
1-11-77	(wrong date format)
.245	(treated as a string, not a float)

The LIKE operator can only be used sensibly with strings. The other operators can be used with any type of value. The comparison operators, such as **>**, perform a lexicographical comparison on strings (upper case letters are greater than lower case; **Z** is greater than **A**; longer strings are greater). Thus

country>Sl

would return **Slovakia**, **Switzerland**, etc., but not **Scotland**). Comparison operators can also be used with dates where, for example, **>** is interpreted as "*later than*".

Special Query Features

The flexibility with which you can assign attributes to objects in *RV2* (described in Objects and Attributes) can produce some unusual effects in queries. While these provide only minor anomalies and produce intuitive results, you should be aware of their existence. You can then use them to your advantage.

An object might not have the attribute named in a query.

"Inner diameter"=20

...would eliminate all objects which did not have the specified value of the **Inner diameter**, including all objects which had no value of **Inner diameter**.

You can use this mechanism to identify all objects of a type without creating a separate 'type' attribute. For example...

"Inner diameter">0

...should return all objects with an inner diameter (since a zero or negative value would be meaningless).

By now you should understand the difference between the following two queries:

NOT("Inner diameter"=0)
"Inner diameter"<>0

(The first returns any object which does not have an **Inner diameter** of zero. The second returns those objects with a non zero value of **Inner diameter**. The two are only identical in a set where every object has one value of **Inner diameter**.)

An object may have more than one value of the named attribute.

Interests=golf

...will return all objects with this attribute combination, even if they also have other values of **Interests**. This allows us to combine search conditions in *RV2* in a way that would appear contradictory in a database where every object takes one value of each attribute, e.g.

Interests=golf AND Interests=tennis

Contextual Queries

Instead of specifying an attribute value explicitly in a query, you can instruct *RV2* to obtain values for a specified attribute name, either from the Blackboard or from the current object (see Current Card). The technique is the same as that which is used for Displaying Attribute Values in a spot, i.e. the name is preceded by **!** for an attribute of the current object, or by **?** for an attribute from the blackboard. Thus the query

surname=!author

should be read as "*find the value of author for the current object and use it in this query as a target value of* ***surname***". Since the two halves of the query will often use the same attribute name, shorthand forms have been created:

surname=!surname can be written as **!!surname**
surname=?surname as **??surname**

The latter, therefore, should be read as "*find all objects with the same value of surname as that stored in the blackboard*".

These contextual conditions can be used as part of a more complex query...

object="personnel record" AND !!surname

...but they can currently only be used with the **=** operator (not **<, LIKE**, **>=**, etc..).

Contextual queries are particularly useful when embedded in a query link (see Link Types) in a foreground which has been created to be used with many objects. The query can tailor itself to the values of the current object thereby allowing easy links to related material (see the Contextual Link Example).

If there is no value of the specified attribute...

...for the current object, the user is asked to use the Blackboard values or to cancel.
...in the Blackboard, the user will be prompted to select one or more values for the Backboard or to cancel the query. A third option is available in query links where, in the absence of a requested blackboard value the corresponding condition of the query is to be ignored (i.e. if a value has not already been specified then allow any value).

If there is more than one value of the named attribute...

...*RV2* takes the union of the matching values i.e. the query returns all objects which match any one of the values. Thus if the condition....

!!Interests

....is directed to an object with three values of **Interests** (**tennis**, **football**, **art**), then the query is expanded as...

Interests=tennis OR Interests=football OR Interests=art

If the condition uses Fixed Attributes...

The **!** symbol can also be combined with fixed attributes (description, background file name, or foreground name) using the special forms:

!_description **!_foreground** **!_background**

These three strings can be shortened to the first 6 characters (**!_desc**, etc.) and written in upper or lower case. Note that, conversely, the case of attribute names is critical unless the Case Sensitive option has been switched off. Also note, fixed attributes cannot be stored to the blackboard - hence they cannot be used with the **?** operator.

Query Messages

Use of incorrect syntax in a query will normally produce at least one of the following messages:

Invalid attribute name. The name which you have specified is not used in the current dataset.
Wild cards are not allowed.

Wrong Date format. You must use DD-MM-YY (see Query Type Handling).

'?' cannot be used with description, foreground or background. (See Contextual Queries).

Description, foreground & background cannot be used with comparison operations. (See Fixed Attributes).

Search syntax error. Covers everything else that you can do wrong such as incorrect value types, unbalanced brackets or quotes, an incomplete condition....

If you've used a contextual query you may see one of the following (see Contextual Queries):

No current value for this attribute.

No blackboard value for this attribute.

If the syntax is correct but the search criteria are too tight you will see:

No matching objects found : search ignored. There's nothing wrong with your query syntax - you just constrained it too tightly.

If you see one of the following messages, please report it directly to us:

Search syntax error - cannot backup.

YACC stack overflow.

Contextual Link Example

Contextual Queries are intended to simplify the job of finding data which relates to whatever you are currently looking at. Thus, if you are looking at a 'person' object and you know that every person object includes a value for department you can use one simple query

!!department

to find everything relating to that department (without even naming it). This approach becomes even more powerful when you embed these generalised queries into spots on generalised foregrounds. You don't then even need to type this simple query

We will take this departmental personnel example and extend it to a dataset which contains entries for departments, for individual people, and for specific projects. Each type of object will have a standard foreground, created for use with that object type alone - so we only need to create 3 different foregrounds. The 'people' foreground can have a series of buttons with embedded contextual links...

"*People in this department*"
object=people AND !!department

"*Details of department*"
object=department AND !!department

"*Details of current project*"
object=project AND project=!"current project"

"*People working on this project*"
object=people AND !!"current project"

... and so on. The important point is that these queries only need to be written once and then reused, within a foreground, with every new person who is added to the dataset.

Notes.

Department has been used as an attribute name and as a value (of object).

The value of one attribute (**current project**) has been used as a target value of another attribute (**project**).

The **object** attribute is superfluous. Object type can be identified implicitly from other attributes - in this example the foreground would suffice and the last two queries could be re-written as

_fore=3 AND project=!"current project"

!!_fore AND !!"current project"

(assuming that the project foreground is foreground number 3).
