XEROX

ANALYST
User Guide

Xerox Special Information Systems

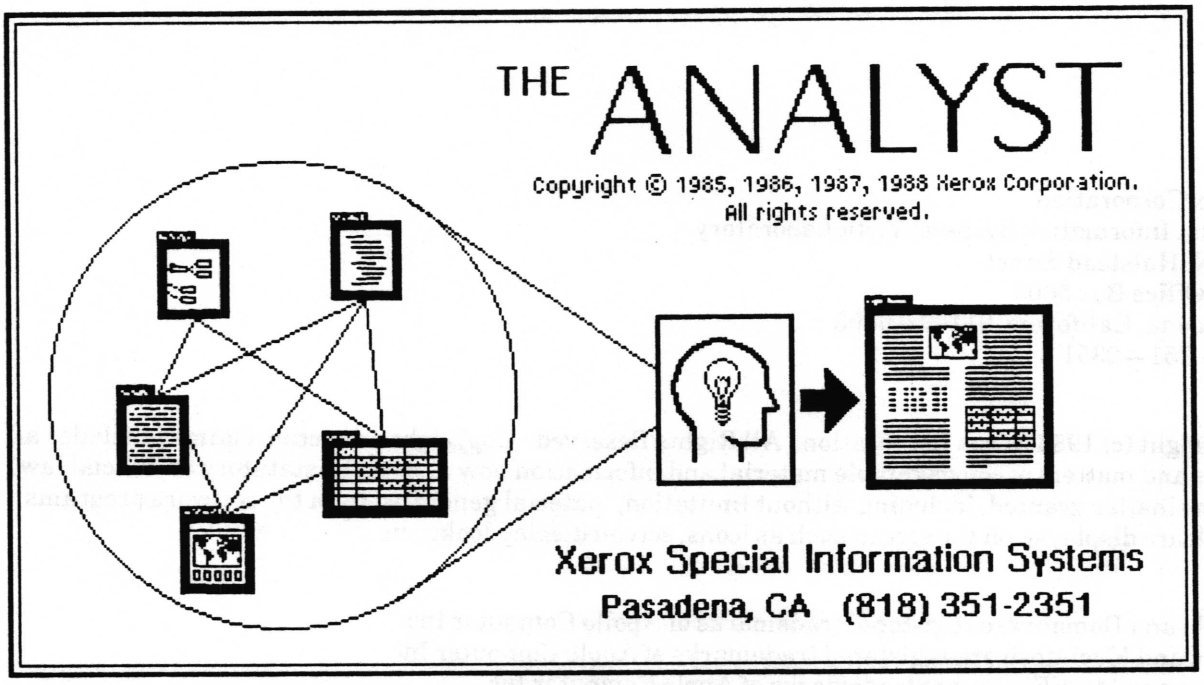
Volume II



The ANALYST (tm) V3.0

User Guide

Volume 2



October 1988

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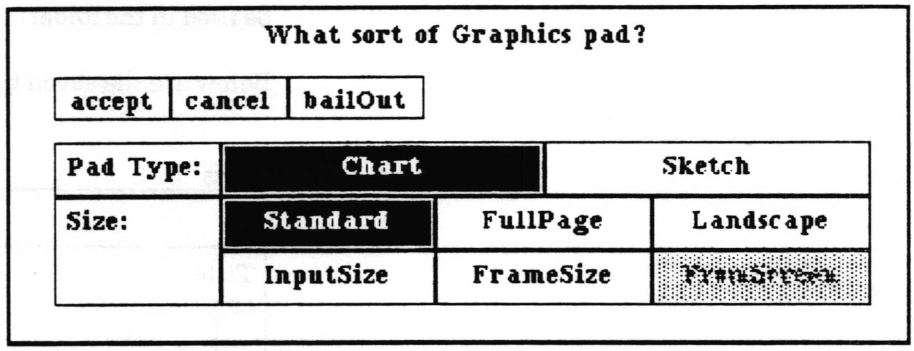
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Chart Editor

The Chart Editor is a data–driven graphics tool that uses your data to produce different types of charts. You can produce pie, bar, or line charts, clustered and stacked bar charts, or x–y scatter plots. You may use data which is already available from a Database or create your own data as you go along. The Chart Editor also has all the features of the Sketch Editor for bitmap manipulation.

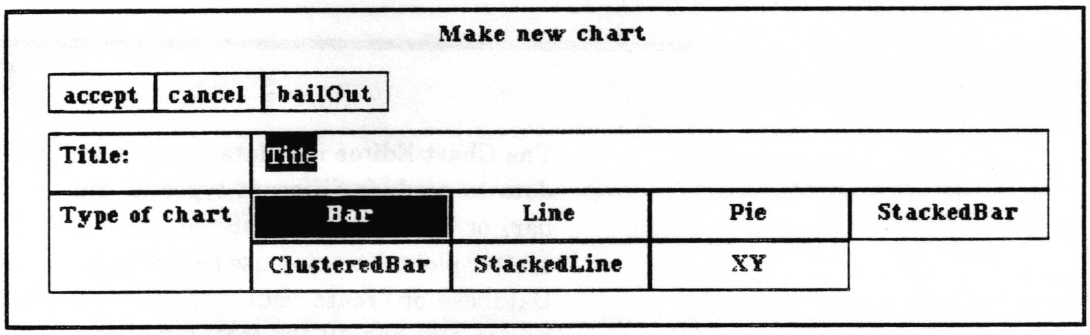
Creating a Chart Editor

To open a new, blank Chart Editor, select **Graphics Pad** from the middle mouse button system menu. A **What sort of Graphics pad?** QBox appears. Select **Chart**. The various **Size** selections are the same as described in the *Sketch Editor* section of this User Guide.



After placing the Chart Editor window on the screen, when you move the cursor into the edit pane, a **Make new chart** QBox will appear. Enter a title for your chart as you want it to appear in an Information Center, select the type of chart you want to make, and accept the QBox. You can later switch among the single data family of charts (Bar, Line, Pie and XY) or stacked data family of charts (StackedBar, StackedLine, and ClusteredBar), but once you have entered your data, you cannot switch to the other family of chart types.

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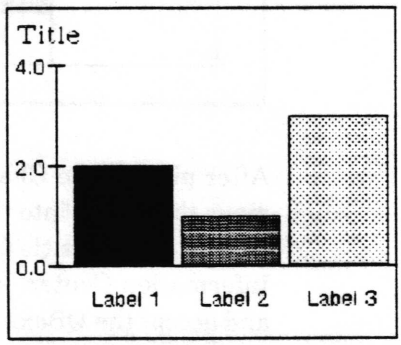


After accepting the QBox, the New Chart Editor window will open, ready for editing. An Origin cursor will appear, prompting you to frame a **Making new chart data** window. See the "Making new Chart Data window" subsection of this document for details. A new Chart cannot be saved and stored as an Information Center item until some data has been entered through the **Making new chart data** window.

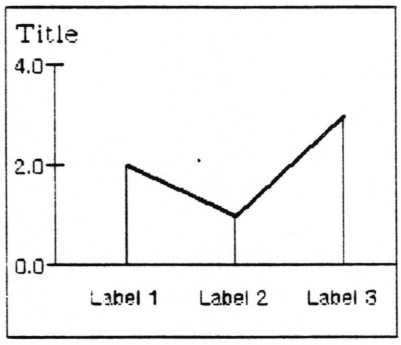
When the chart is saved for the first time, a **File request** QBox will prompt for a file Name, Keywords, Information Center, Classification and Controls parameters and Filing Method. After accepting this QBox, the name of the chart and this icon will be filed in the folder.

Below are the seven types of charts you can create.

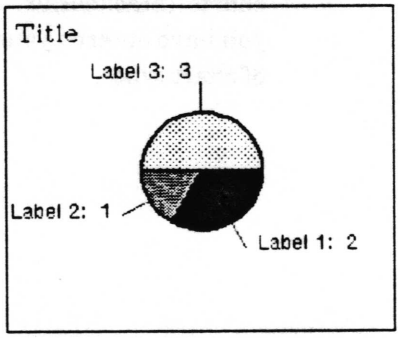
Single data types of charts



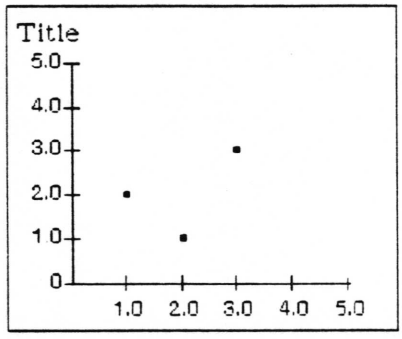
Bar



Line



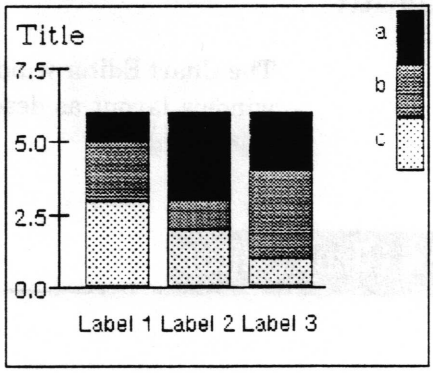
Pie



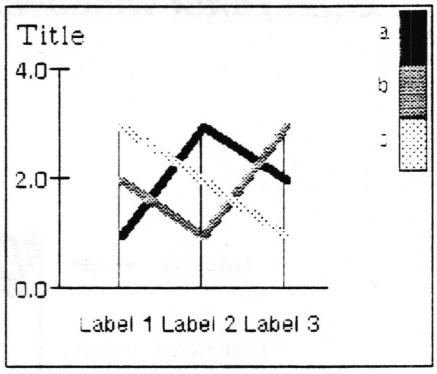
XY

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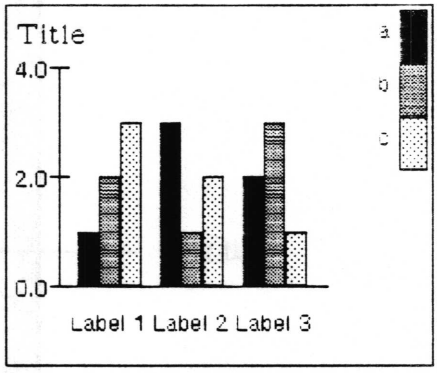
Stacked data types of charts



Stacked Bar



Stacked Line



Clustered Bar

Creating a new chart from a database

To open a new Chart using data from database records, refer to the *Database* documentation in this User Guide. The middle mouse button menu option **utilities> chart data** in the Database window's hits pane is used to create the Chart Editor.

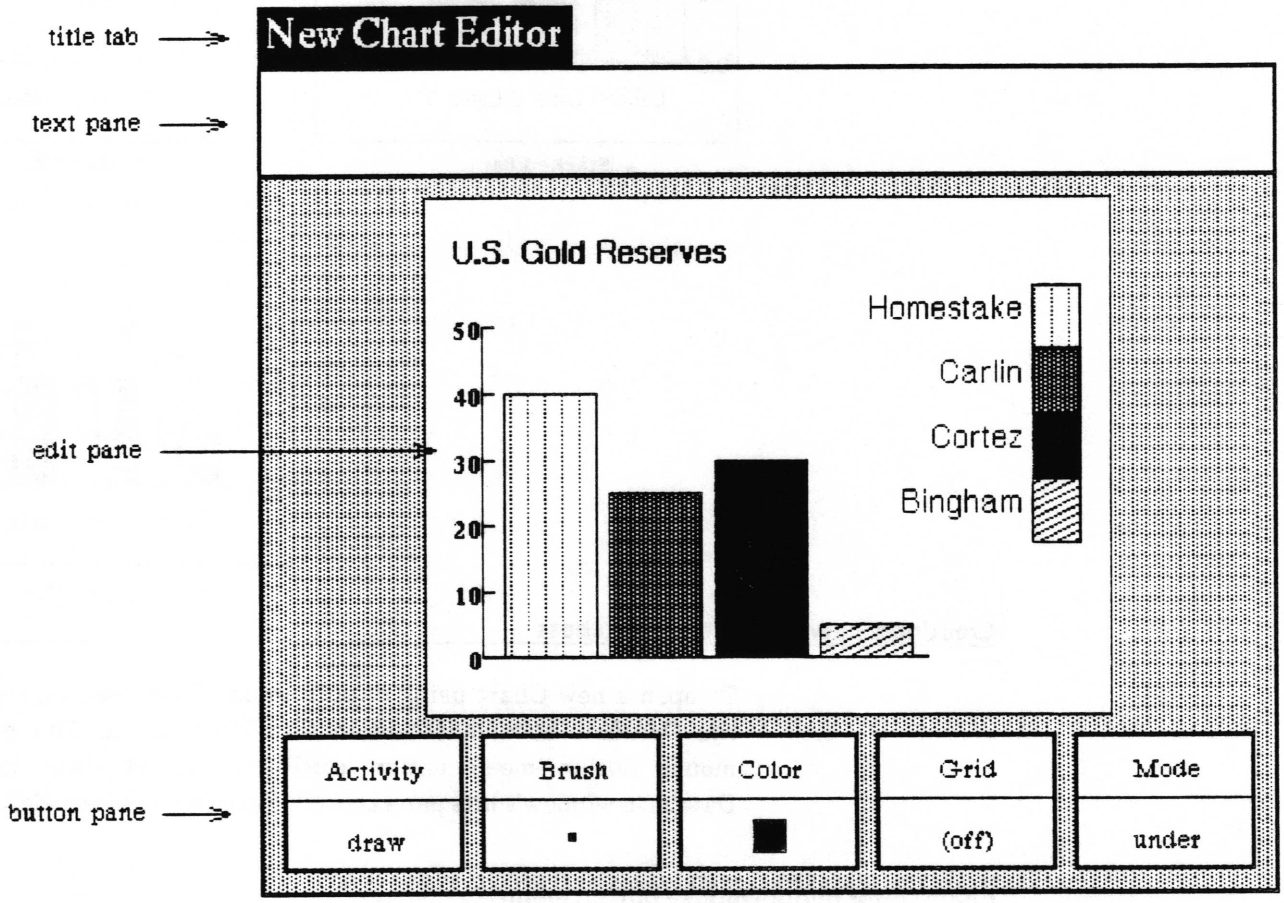
Chart Editor middle mouse button menu

A third way to create a chart is by using the Chart Editor's middle mouse button menu item **change data> replace data**. This selection enables you to replace the contents of the current chart with a new chart, including choosing a new type of chart and entering new data,. This new chart can overwrite the existing item in the Information Center, or can be filed as a new item in an Information Center.

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Chart Editor window layout

The Chart Editor window layout is the same as the Sketch Editor window layout as described in the *Sketch Editor* section of this User Guide.



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Chart Editor usage

Chart vocabulary

The edit pane will display the data you have entered as the type of chart you selected. Below is an illustration of the terms used in this section to describe what is displayed in the Chart Editor edit pane by the Chart Editor itself. The terms illustrated below are defined in the Glossary of this section.

Since the Chart Editor edit pane also works as a Sketch Editor edit pane, you may add additional images to the chart by using the Chart Editor button pane. Refer to the *Sketch Editor* section for a complete description of the use of the button pane.

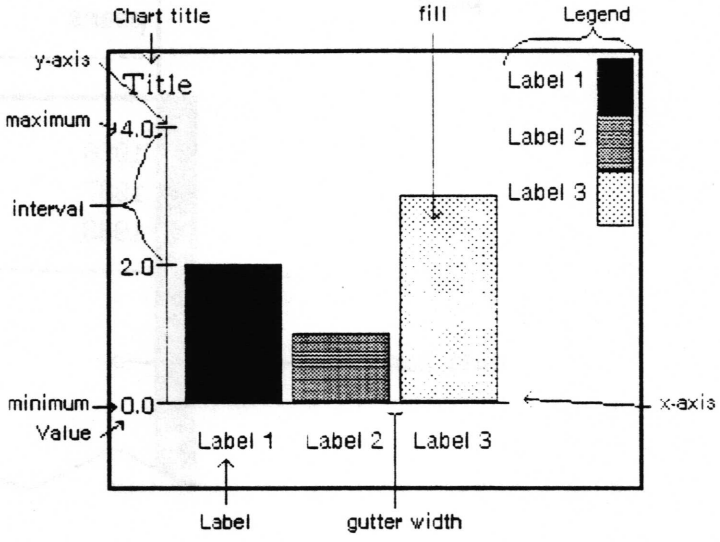


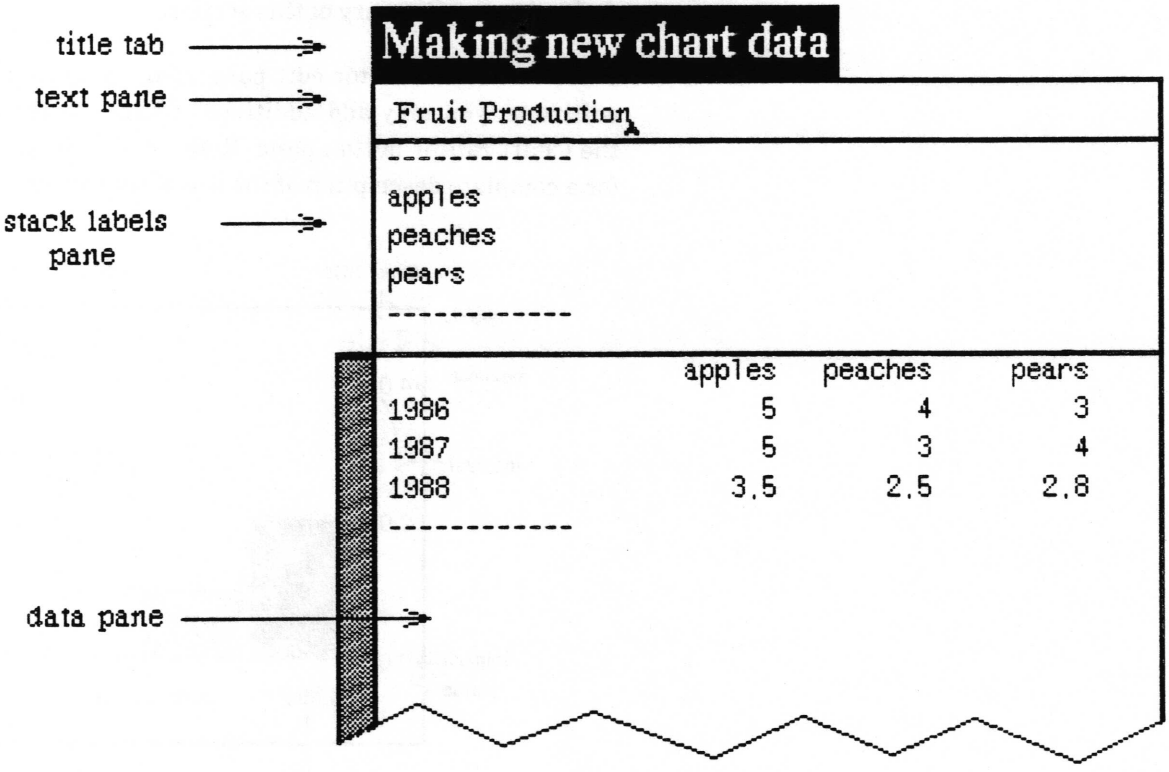
Chart Editor text and button panes

The Chart Editor's text and button panes work like the Sketch Editor's. The Brush can be applied anywhere within the Chart Editor's edit pane, just as with the Sketch Editor. It is the chart data window, described in the next section, which actually puts the data into the edit pane. The features of Sketch Editor, however, may be used to enhance the Chart, for example, by changing the Color of the fillings of the bar or pie chart.

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Making new chart data window layout

A new Chart Editor data item cannot be saved and stored in an Information Center until it contains some data. The **chart data window** allows the user to enter and modify the data which reside in the Chart Editor. Depending on the data type, there will be two (single) or three (stacked) panes from top to bottom.



title tab

The *title tab* contains a name which indicates how the data editor was called by the user. A **Making new chart data** tab indicates that the data is required for a new Chart Editor. An **Editing Chart Data** tab indicates that the user has selected **change data> modify data** or **replace data** to edit an existing Chart.

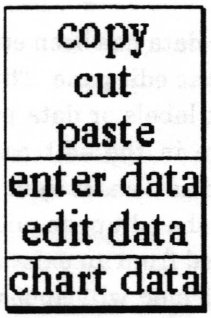
text pane

The *text pane* is a simple text editor pane where you may type and/or edit the chart title as it is to appear in the edit pane of the Chart Editor.

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stack labels pane

The *stack labels pane* is used to enter and edit the names of the components of a stacked data chart (Stacked Bar, Stacked Line, or Clustered Bar). Rather than accepting type–in, it contains a middle mouse button menu which allows the user to select the action and perform any typing in QBoxes.



copy Puts a duplicate of the selected text into the clipboard.

cut Removes the selected text and places it in the clipboard.

paste Inserts the contents of the clipboard over the selected label. If no label is selected, the contents of the clipboard is inserted as a label at the end of the list of labels.

enter data Opens the **Enter Stack** QBox. Refer to the "Editing chart data" subsection for a complete description of this QBox.

edit data Opens the **Edit Stack** QBox on the selected stack label or chart datum.

chart data Redraws the chart in the Chart Editor pane using the new data.

data pane

The *data pane* consists of a list of entries with the label on the left and the value(s) on the right. Like the stack labels pane, it does not accept type–in, but uses the middle mouse button menu functions for entering and editing text. These menu item selections work as described as above under stack labels pane, except that the following functions bring up appropriately named QBoxes.

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enter data Opens the **Enter Data** QBox. Refer to the "Editing chart data" subsection for a complete description of this QBox.

edit data Opens the **Edit Data or Edit Stack Data** QBox on the selected stack label or chart datum.

Saving the Chart Editor window and data

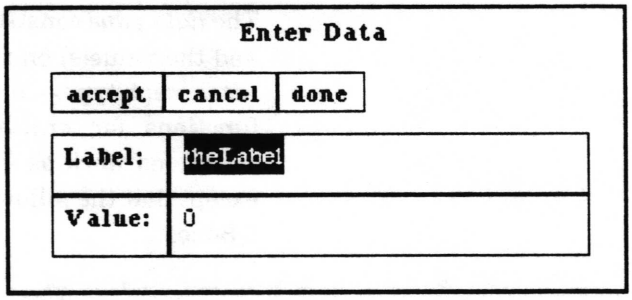
Once data has been entered, the Chart Editor will draw the chart into the edit pane. This is done by selecting **chart data** from the stack labels or data pane middle mouse button menu. The chart image in the edit pane and the data that produced it may be saved as a chart item in an Information Center by selecting **save** from the edit pane middle mouse button menu. If the window was opened from an existing Chart or has already been saved once, a Confirmer will appear asking whether to overwrite the saved version. If you select *no*, or the chart has never been saved, a **File request** QBox will appear for you to fill out. The Chart and its data will be stored and this icon will appear in the folder next to the title of the Chart.

Editing chart data

Entering data

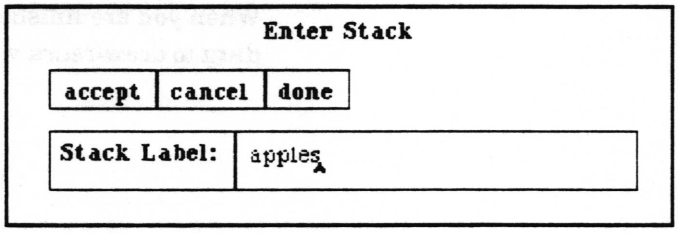
To enter new data, select **enter data** from the middle button menu of the data pane.

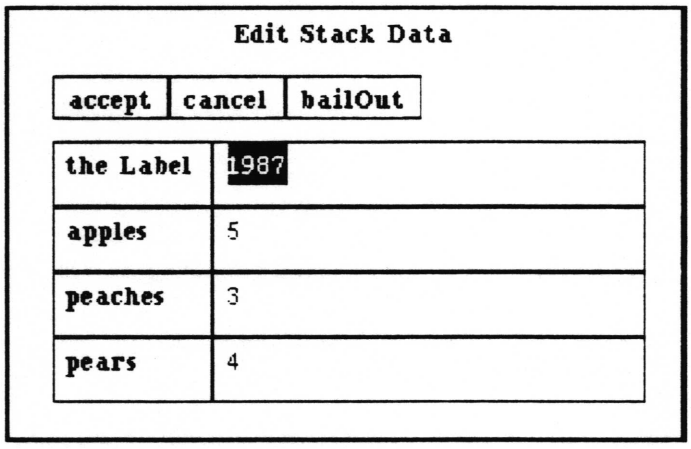
An **Enter Data** or **Enter Stack Data** QBox will appear. Type in the Label and Value(s) and select **accept**. If you type a carriage return after entering the last value, it will automatically select accept for you. The data set will be entered in the window and a second QBox will be displayed. Continue entering data into the QBoxes and **accept** each one or, if you are finished entering data, select **done** to the QBox which appears after your last entry. Note that done does *not* cause an **accept**.



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Entering the stack labels in the stack labels pane works exactly the same way, except that the middle mouse item **enter data** in this pane brings up an **Enter Stack** QBox in which to type the names of the stack labels. The middle mouse item **enter data** pane brings up the **Edit Stack Data** QBox showing the known stack labels to the left.





Changing chart data

When you select **change data> modify data** from the Chart Editor's edit pane middle button menu, a chart data window with the current data in it will be opened.

To modify an existing data entry in either the stack labels pane or the data pane, select the line containing it with the left mouse button and then select **edit data**. An **Edit Data**, **Edit Stack** or **Edit Stack Data** QBox will appear with the current values as defaults. Change the values and then accept the QBox. The change will be reflected in the window. **Copy**, **cut** and **paste** allow you to change the order of, or delete, data.

If you want to redraw the current Chart Editor's contents and enter and display new data, select **change data> replace data** from the Chart Editor's edit pane middle button menu. You will first be prompted with a **Make new chart** QBox to specify the chart title and type, and then an empty **Making new chart data** window will be opened. The new data will replace the old data for

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that Chart Editor, and if saved, the item in the Information Center will contain the new data and the new Chart. When save is selected, a Prompter will ask if you wish to overwrite the existing file.

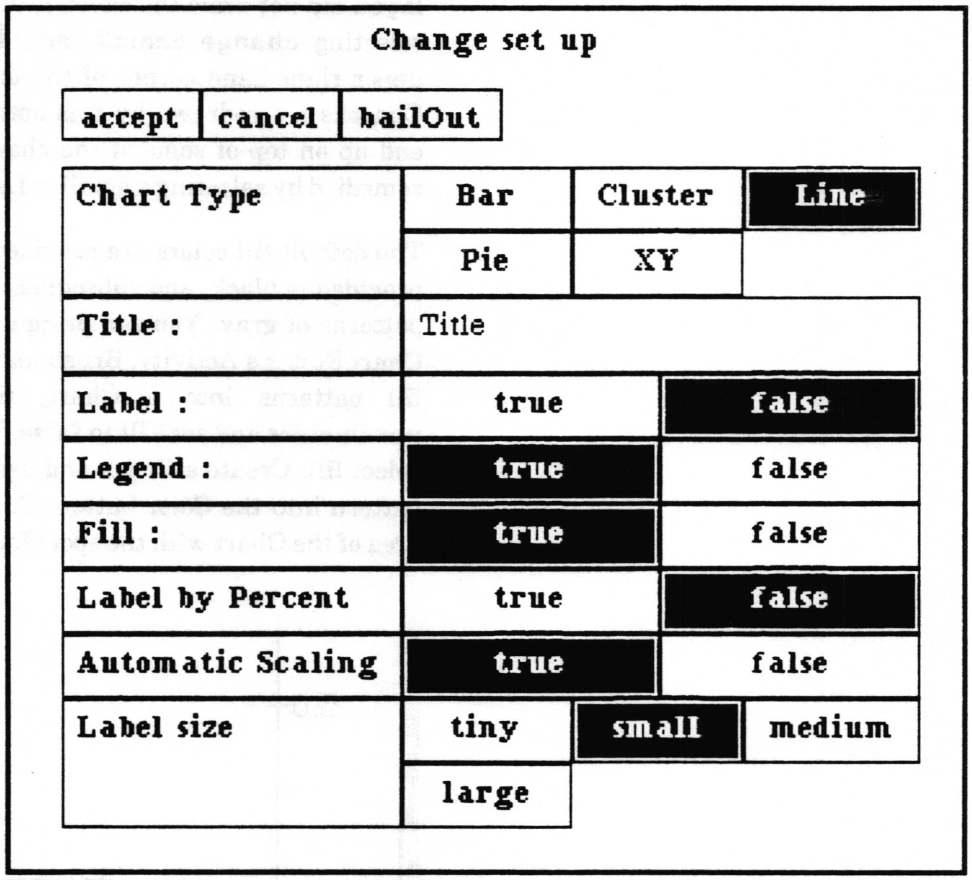
Updating (redrawing) the chart

When you are finished entering and/or editing data, select **chart data** to draw/redraw the chart in the Chart Editor's edit pane.

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Changing the type of chart

The type of the chart is changed in the **Change set up** QBox that is displayed by selecting **change chart> parameters** in the Chart Editor edit pane middle button menu. For single data, you may choose from Bar, Line, Pie, and XY. To use XY, however, your labels (x – axis) must be numerical values. For stacked data, you may choose from Bar, Cluster, or Line.



Adding and changing the chart labels

Whether or not the data labels are displayed on the x – axis is controlled by the **Label** field in the **Change set up** QBox that is displayed by selecting **change chart> parameters** in the edit pane middle button menu. You may also control the size of the label text by using the **Label size** field in that QBox. If the labels are overlapping each other, you can reduce the label size. Or if that is insufficient, remove the labels by setting **Label:** to false and just use a legend.

If you did not draw the chart with the labels and just want to add them onto the chart, selecting **change chart> add labels** will display them on the existing chart image with a text size of whatever is currently defined.

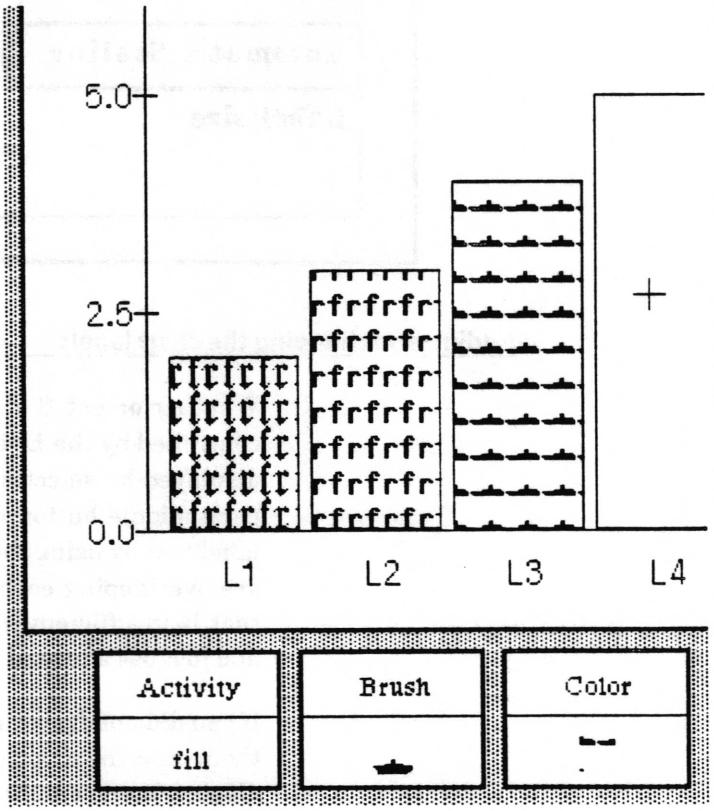
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Changing the chart legend and fill colors

Whether or not a legend is created and displayed in the upper right hand corner of the chart image is controlled by the **Legend:** field in the **Change set up** QBox that is displayed by selecting **change chart> parameters** in the edit pane middle button menu. When **Legend** is true, you will usually want **Fill** to also be true, since otherwise the color identifiers will be blank.

If you did not draw the chart with the legend and want to add it, selecting **change chart> add legend** will display it in the upper right hand corner of the existing chart image. Since the Chart is not redrawn by this option, the legend will frequently end up on top of some of the charted data. This can usually be remedied by selecting a smaller **Label size** parameter.

The default fill colors are provided by the system. The first color provided is black, and subsequent colors are varying shades and patterns of gray. You can design your own fill colors, using the Chart Editor's Activity, Brush and Color buttons. To insert these fill patterns into a Chart, first select **change chart> parameters** and set **Fill** to **false**. Then use the Activity button to select fill. Create a Brush and use **copy** and **paste** to insert the pattern into the Color button. Then use the crosshair to fill the area of the Chart with the specified Color.

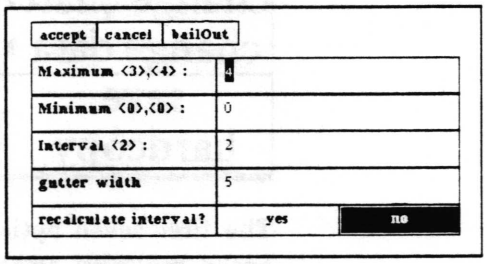


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Scaling of the y – axis

The Chart Editor will automatically figure out the scaling of the y – axis unless you disable the scaling feature. To enter your own scaling, select **change chart> parameters** in the edit pane middle button menu. Then select **false** in the **Automatic Scaling** field on the **Change set up** QBox. You can also choose whether or not to let the system recalulate the interval. When automatic scaling has been disabled, every time the chart is drawn this QBox will appear for you to fill in with the scaling parameters. It will be filled with the values the automatic scaling would have used. (Unfortunately, the chart does not currently save the values you fill in and that the chart is drawn with, so you must reenter them every time).

A QBox will open to allow you to enter the Maximum, Minimum, Interval, and gutter width (x – axis).



Maximum is the largest value on the y – axis. Next to **Maximum** in the QBox, the largest value in your data is displayed inside a set of angle brackets, and then the value the automatic scaling would have used is displayed inside a set of angle brackets. **Minimum** is the smallest value on the y – axis. Following its field label in the QBox is displayed inside angle brakets the minimum value in your data (or 0 if it is lower), and then the value the automatic scaling would have used. **Interval** is the number of units between display of y – axis labels. Following its field label in the QBox the interval that would have been used by automatic scaling is displayed. If you select *yes* in **recalculate interval?**, the Chart Editor will automatically recalculate the interval for you based on the values you enter for **Maximum** and **Minimum**. The **gutter width** field refers to the distance in screen pixels between display of the bars in a bar chart, or sets of bars in a clustered bar chart. By changing this value, you are also changing the width of the bars.

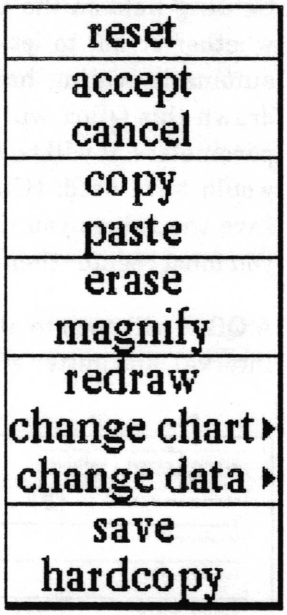
Changing the size of the chart

The Chart Editor middle button menu option **change chart> size** will let you frame a size for the chart to be redrawn. It will open a new Chart Editor and pass the data from your current chart to it.

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Edit pane middle mouse button menu

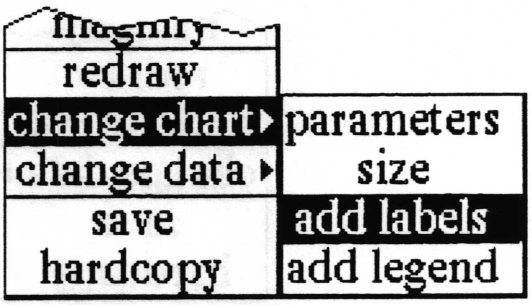
The middle mouse button controls the popup menu for the edit pane.



The first seven options, **reset**, **accept**, **cancel**, **copy**, **paste**, **erase**, **magnify**, and the last option, **hardcopy**, are as defined in *Sketch Editor* and will not be repeated here.

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add labels



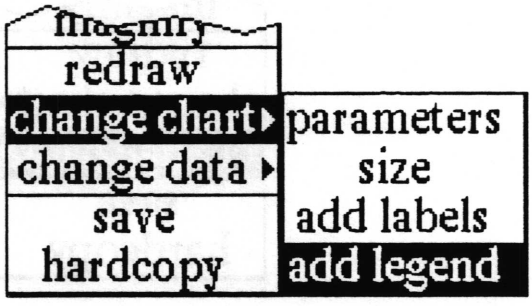
Concept Displays the data labels below the x–axis on the currently displayed chart using the currently defined label size.

Procedure Select **change chart> add labels** from the popup menu.

Effect The labels will be displayed, regardless of whether they are already displayed.

Related topic **Adding and changing the chart labels**

add legend



Concept Displays a legend in the upper right hand corner of the currently displayed chart.

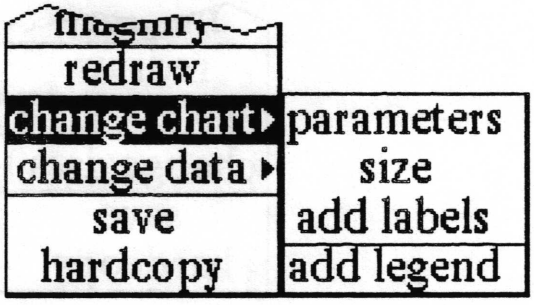
Procedure Select **change chart> add legend** from the popup menu.

Effect A legend will be created and displayed, regardless of whether a legend was already displayed. Since the chart is not redrawn by this option, the legend will frequently end up on top of some of the charted data.

Related topic **Changing the chart legend and fill colors**

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change chart>

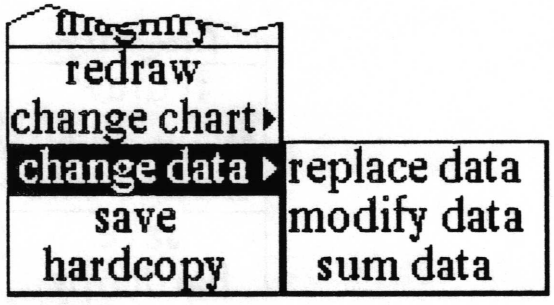


Concept Allows you to alter the appearance of the chart in the Chart Editor window.

Procedure Select an item from the menu tree **change chart>**. Each of these selections is documented in alphabetical order in this section of the User Guide.

Effect Each of the selections performs the action listed, or opens an appropriate QBox.

change data>



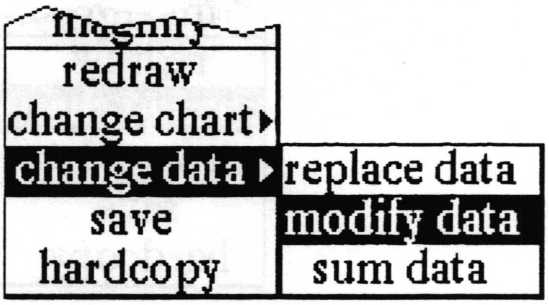
Concept Allows you to manipulate the data which is used to draw the Chart.

Procedure Select an item from the menu tree **change data>**. Each of these selections is documented in alphabetical order in this section of the User Guide.

Effect Each of the selections performs the action listed, or opens an appropriate QBox or windnow.

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modify data



Concept Allows you to edit the chart data.

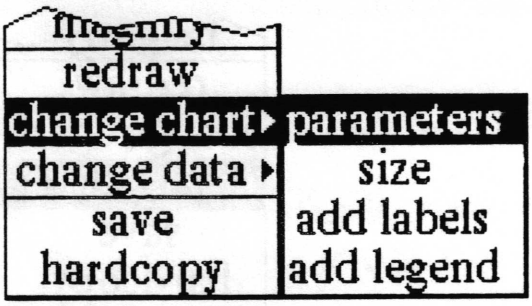
Procedure Select **change data> modify data** from the middle button menu in the edit pane. An Origin cursor will prompt you to frame a chart data window which will contain the current chart data values.

Effect Opens a Chart Data window for editing the chart data.

To modify an existing data entry in either the stack labels pane or the data pane, select the line containing it with the left mouse button and then select **edit data**. An **Edit Data**, **Edit Stack** or **Edit Stack Data** QBox will appear with the current values as defaults. Change the values and then accept the QBox. The change will be reflected in the window. **Copy**, **cut** and **paste** allow you to change the order of, or delete, data.

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parameters



Concept Used to set (change) most of the chart drawing parameters.

Procedure Select **change chart> parameters** from the middle button menu in the edit pane. This will display the **Change set up** QBox with the current parameters.

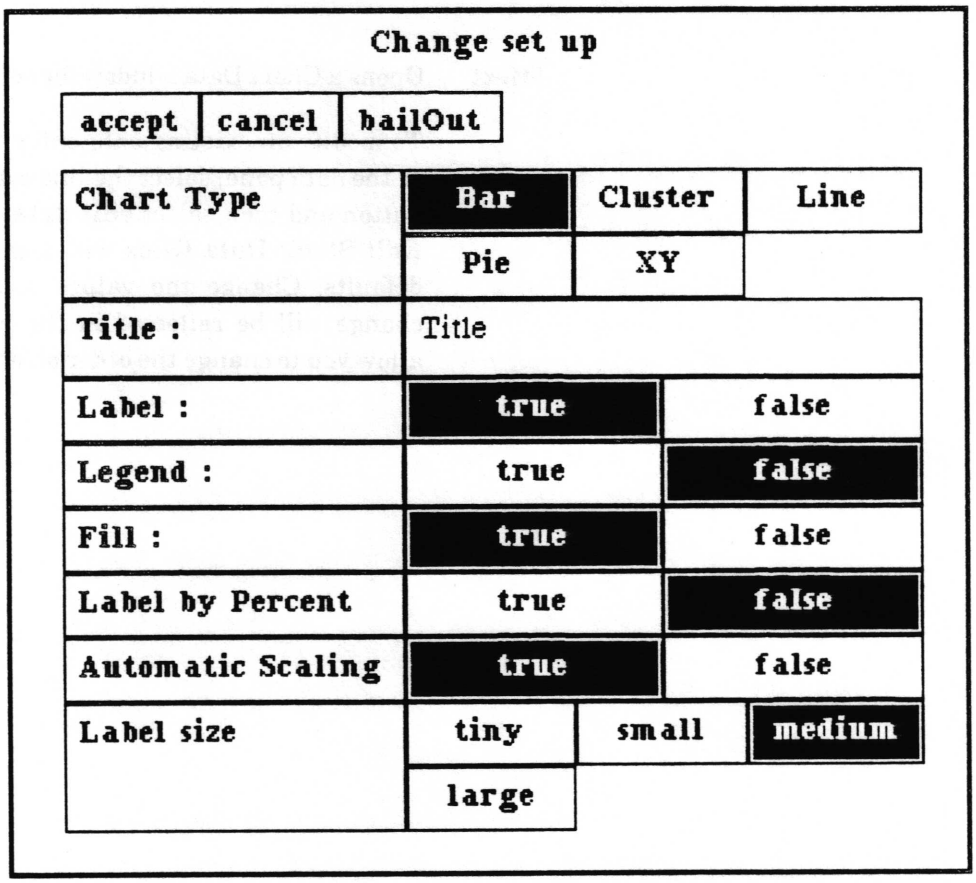


Chart Type
See the "Chart vocabulary" and "Changing the type of chart" subsections for an explanation and illustration of the chart types.

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Title:
This is the text that will be displayed in the upper left–hand corner of the chart. If you do not want any title automatically put on, delete the contents of this field.

Label:
This parameter controls whether or not to display the data labels on the x–axis. True will display the labels; false will not display them. See the "Changing the chart labeling" subsection above.

Legend:
This is whether or not to display a legend in the upper right hand corner of the chart. See the "Changing the chart legend" subsection above.

Fill:
This is whether or not to fill the bars or pie segments with a color pattern. Probably the only reason to make this *false* is if you plan to create your own patterns as Colors.

Label by Percent
This parameter is for pie charts. If this is true and **Label:** is true, the pie chart segments will be labeled with a percentage figure instead of label: value. The legend does not change.

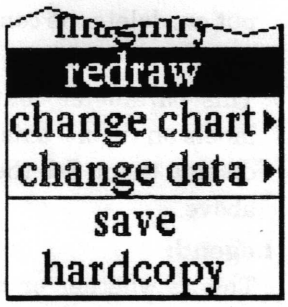
Automatic Scaling
This determines whether the Chart Editor will do all the y–axis scaling for you, or you will specify what to use each time the chart is drawn. See the "Scaling of the y–axis" subsection above. If this parameter is false, the scaling QBox also will allow you to specify the gutter width – the horizontal distance between bars in a bar chart.

Label size
This determines how large the labels (if **Label:** is true) will be.

Effect When the QBox is accepted the chart will be redrawn using the new set of parameters.

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redraw

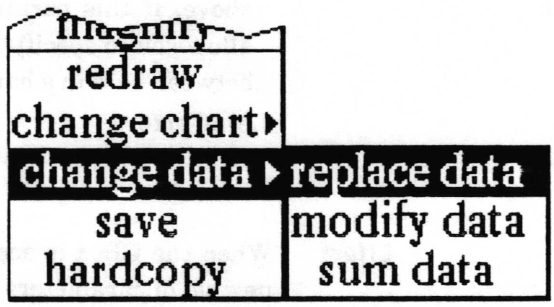


Concept Forces the chart to be redrawn from the chart data according to the current parameters.

Procedure Select **redraw** from the popup menu.

Effect This has the same effect as selecting **chart data** from a Chart Data window menu. Any Sketch Editor type bit editing that has been done will be erased.

replace data



Concept Erases any existing chart data and starts the data creation process.

Procedure Select **change data> replace data** from the popup menu. The **Make new chart** QBox will be displayed. An origin cursor will prompt you to frame a Chart Data window in which to enter the new data. See the subsections of this document entitled "Making new chart data window layout" for details on the use of this window, and "Entering data" on use of the chart data window.

Effect When the **Make new chart** QBox is accepted, any existing chart data is wiped out. The data creation process is restarted.

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save



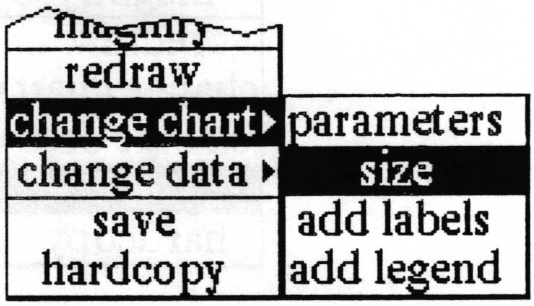
Concept Stores the chart image in one or more Information Centers.

Procedure Select **save** from the popup menu. If the Chart Editor window was opened from an existing chart or has already been saved once, a Confirmer will prompt whether to overwrite the chart item. If you select *no*, or the chart has never been saved, a **File request** QBox will appear.

Effect Writes the chart image in the edit pane, and the data that produced it, to disk as a chart item in one or more Information Centers.

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size



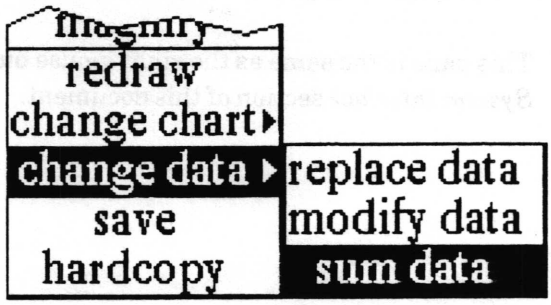
Concept Allows you to change the size of the chart.

Procedure Select **change chart> size** from the popup menu. You will be required to confirm this command if the chart image has been changed since the window was opened or last saved. An Origin cursor will prompt you to frame a rectangle of the size you want the Chart to be. Another Origin cursor will prompt you to place a new Chart Editor window on the screen.

Effect The original Chart Editor window will be closed. The new Chart Editor window will draw the chart in its editing pane using the data passed to it from the old window.

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sum data



Concept Combines entries with the same label into one entry by summing their data values.

Procedure Select **change data > sum data** from the middle button menu in the edit pane.

Effect The values of any data entries that have the same label will be summed and the chart redrawn. If a Chart Data window was open, it will be closed. The original data will be changed (so if you open a Chart Data window you will only see one entry with each label).

For example, if you have a entry with label "Jones" and value "20", and another entry with label "Jones" and value "10", **sum data** will combine the two entries into a single entry with label "Jones" and value "30".

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Right mouse button menu

This pane is the same as the right mouse button menu which is fully described in the *System Interface* section of this document.

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Glossary

automatic scaling This chart parameter determines whether the scaling of the y – axis will be figured out automatically each time the chart is drawn. If it is false, the user will be asked to provide the scaling parameters each time the chart is drawn.

chart data window A window used to enter and/or modify the chart data.

fill A color or pattern occupying an enclosed area such as a bar in a bar chart.

gutter The distance in screen pixels between bars in a bar chart or sets of bars in a cluster bar chart.

interval The number of units between display of y – axis labels.

label by percent A selectable option available in the "Change set up" QBox obtained when changing chart parameters. When selected, a pie chart segment will be labeled as a percent of the whole volume.

legend A display in the upper right hand corner of a chart, used to convey information about the chart. Generally it maps the chart labels to the fill pattern used in the chart.

maximum value The largest value on the y axis.

minimum value The smallest value on the y axis.

parameter A factor used to determine the characteristics, configuration, or appearance of a chart.

scaling Calculation of the maximum and minimum values and the interval on the y – axis. On the x – axis, scaling determines the distance between data points and a gutter width for bar charts.

single data Data which has one value for each entry. For each label on the x – axis, there is one value on the y – axis.

stack label A label for one set of values in stacked data.

stacked data Data which has more than one value for each entry. For each label on the x – axis, there is one or more y values, each of which corresponds to a *stack label*. Stacked data is usually data which has been subdivided. An example is the automobile production of a company for a number of years, broken down by make and model, where the years are the labels and the make and model would be the stack labels.

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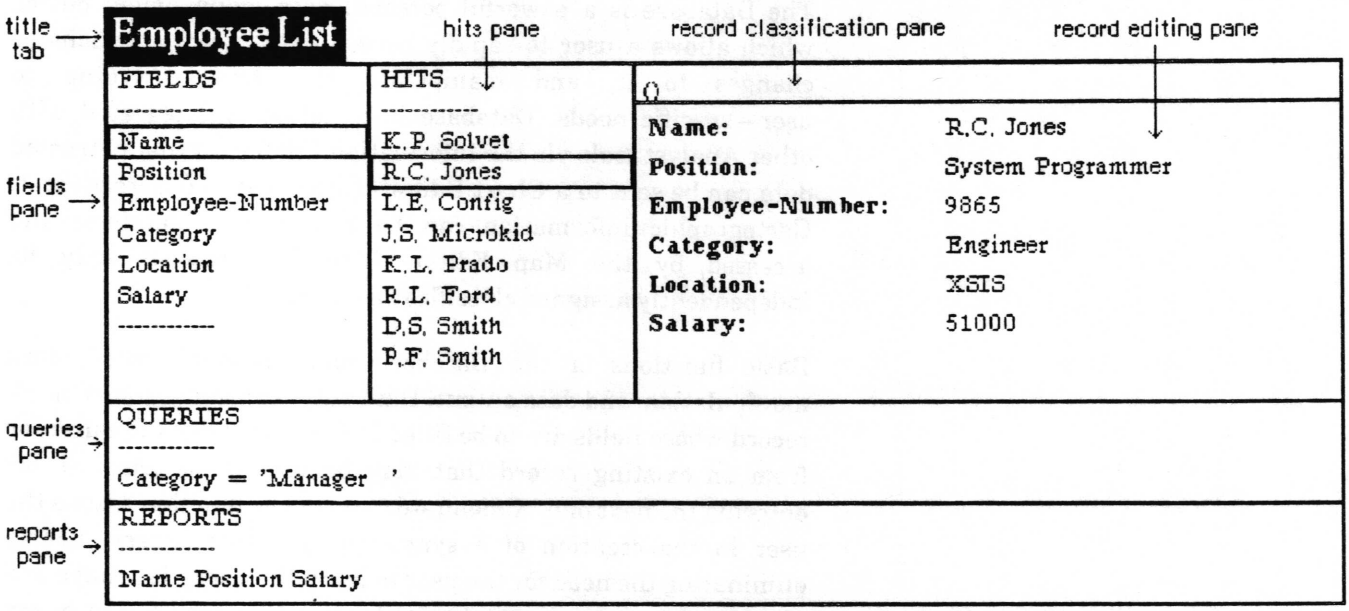
Database

The Database is a powerful personal data management device which allows a user to rapidly review data, make additions or changes to it, and manipulate the data according to user-specific needs. Database information is integrated with other Analyst tools via the Information Center, so that extracted data can be sent to a Chart Editor or accessed in a Spreadsheet. Cartographic information can be stored in a database and accessed by the Map Editor. Individual records may be independently assigned classification levels.

Basic functions of the Database tool are data entry, data manipulation, and data output. Data entry can start from a blank record whose fields are to be filled in from scratch by the user, or from an existing record that may be used as a template for entering the next one. A menu-driven query function assists the user in the creation of a syntactically correct query, nearly eliminating the need for the user to learn the query language and allowing him to concentrate on the question behind the query without worrying about syntax. Data output functions can sort a list of records identified by a query, and then produce a report that can immediately be hardcopied. Selected records may also be sent directly to the Chart Editor to produce line, bar, or pie charts.

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Database window layout



title tab

The *title tab* shows the name of the database item displayed in the Database window.

fields pane

The *fields pane* lists the names of the data fields. Through the middle button menu in this pane, fields can be created, modified, deleted, and the characteristics displayed. Selecting a field name in this pane causes that field of the records in the hit list to be displayed in the hits pane.

hits pane

The *hits pane* shows the records in the current hit list. The *hit list* consists of all or some subset of the records in the database. The contents of the field selected in the fields pane is displayed for each field in the hit list. In addition, a brief summary of the hits appears below the list. The middle button menu in this pane contains a variety of options for altering the hit list, accessing an alternative window for record display, entry, or modification of records, for output to a chart or a new database, and for true elimination of deleted records. Selecting a record displayed in this pane causes that record to be displayed in the record classification and editing panes.

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record classification pane

The *record classification pane* displays the classification, if any, of the record displayed in the record editing pane. The classification appears inside a set of parentheses. This pane has no menu, its contents are changed by changing the record in the record editing pane.

record editing pane

The *record editing pane* is for entering or editing information contained in a database record. It displays the contents of the currently selected record in the hits pane. The data for each field in the record is displayed to the right of the field name. All the fields in the database will be displayed in the same order as in the fields pane. The field identifiers appear in boldface and cannot be edited or deleted.

The text of the data within each field is entered and edited in basically the same way as all text in the Analyst – by typing, copy, cut, and paste. You cannot, however, cut or paste more than the contents of one field at a time.

The tab key will cause the text selection to jump to the next field (or to the first field from the last). Holding down the left shift key while striking the tab key will cause the text selection to jump to the previous field (or to the last field if the first was selected). The carriage return key will move the text selection to the beginning of the next field, and in conjunction with the left shift key will move the text selection to the beginning of the previous field.

The middle button menu in this pane provides the facilities for, among other things, adding the displayed record as a new record, overwriting the selected record, creating a blank record, and classifying the displayed record.

The editing features available in this pane are very simple and the pane is not meant to contain large amounts of text. For an alternative method of record entry and editing, see the section on "form based record entry and editing".

queries pane

The *queries pane* is used to query or filter the records in the database or hit list into some subset. It allows you to enter and, if you wish, keep track of queries for your particular database.

The pane contains a list of any queries you have added. The middle button menu provides options for both manipulating the list of queries and for using them on the entire database or against the hit list displayed in the hits pane.

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reports pane

The *reports pane* is used for combining the data from specified fields of the records in the hit list and outputting it in a format suitable for a textual report. A list of the fields that are to be included in a report, in the order in which they are to appear, may be added as a selectable item in this pane for later use. The middle button menu provides options for manipulation of the list of report formats, for convenient modification of the hit list, and for initiating the creation of a report.

classification bars

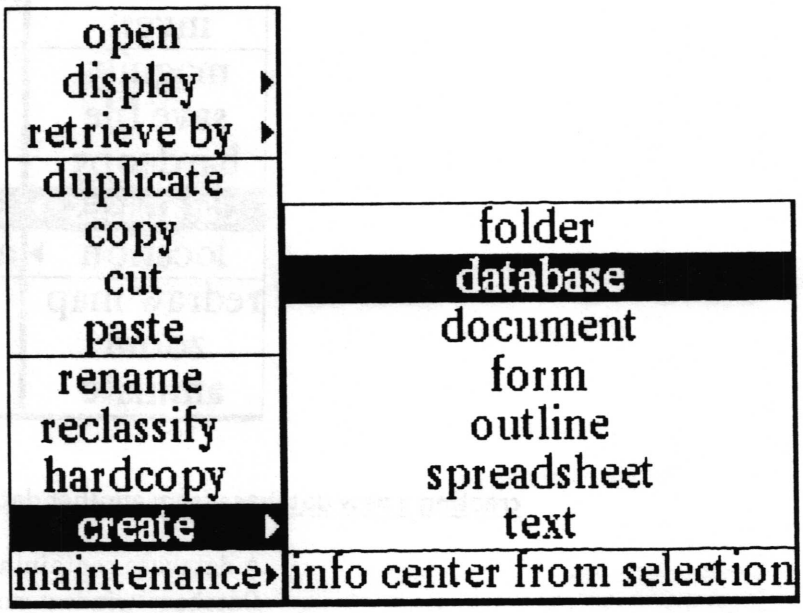
The *classification bars* are displayed on the top and bottom of the Database window if any record in the database is classified. The classification displayed in the bars will reflect the highest classification level of any record in the database, and the addition of the modifiers of all the records. The classification of any records which have been deleted but not expunged from the database file is included.

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Database usage

creating a new database in an Information Center

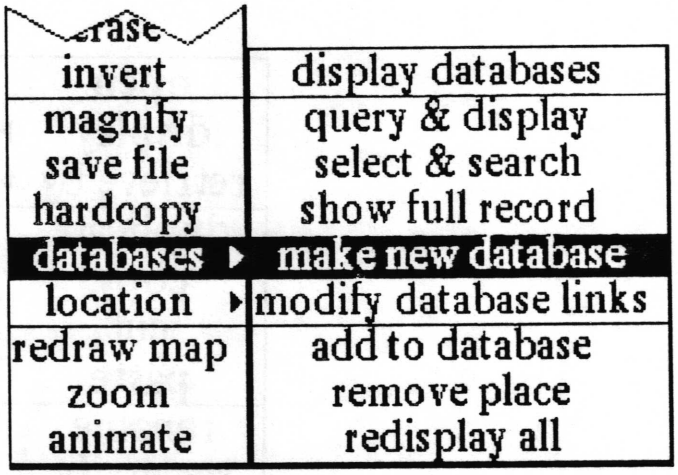
A totally new and empty database can be created in an Information Center by selecting **create> database** in the middle mouse button menu of an Information Center folder. A **Create new database** QBox will appear to request the database name and key words. After filling it out and selecting accept, the newly created database will be inserted into the folder and a Database window will be opened on it.



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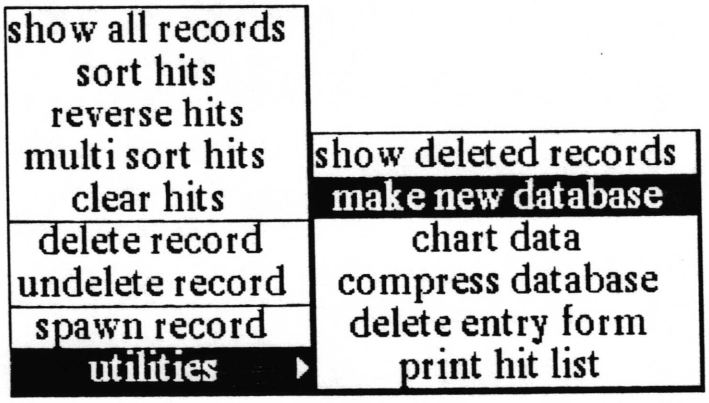
creating a new database from a map

A database with no records but the default fields necessary for use with maps (such as latitude and longitude) can be created by selecting **databases> make new database** from the middle mouse button menu of a Map Editor's editing pane. A **File request** QBox will appear to request the information necessary for creating the new database and filing it in one or more Information Centers. After filling out the QBox and selecting accept, the newly created database will be filed in the designated Information Center(s) and linked as a map database to the map it was created from.



creating a new database from another database

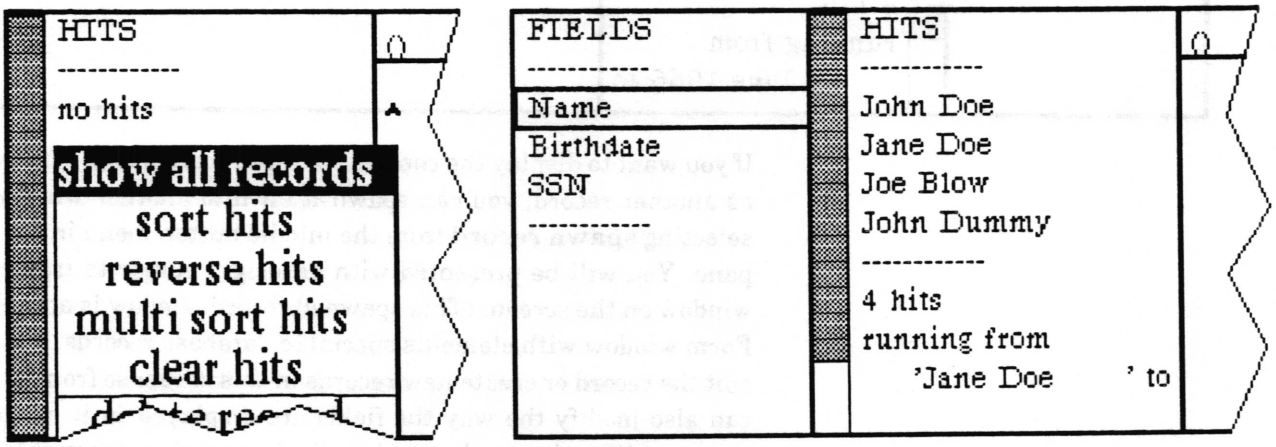
A database containing only the records in the hit list of an open Database window can be created by selecting **utilities> make new database** from the middle mouse button menu of that window's hits pane. A **File request** QBox will appear to request the information necessary for creating the new database and filing it in one or more Information Centers. After filling out the QBox and selecting accept, the newly created database will be filed in the designated Information Center(s).



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displaying the list of records (the hit list)

Upon opening a window on a database, the list of records in the hits pane (the hit list) is always empty. There are four ways of getting records into the hit list: showing all the records in the database, adding new records to the database, querying the database, and undeleting deleted records.



The hits pane displays the contents of just one field of each record in the hit list. The field that will be displayed is the field whose name is selected in the fields pane. If no field is selected in the fields pane, it will default to the first field. You may change the displayed field by changing that selection at any time.

Beneath the list of records in the hit list is displayed a brief summary of the number of hits, the value of the selected field for the first and last hit, and the sum total of the values if the field is numeric.

To show all the records in the database in the hits pane, select **show all records** from the middle button menu in the hits, queries, or reports panes.

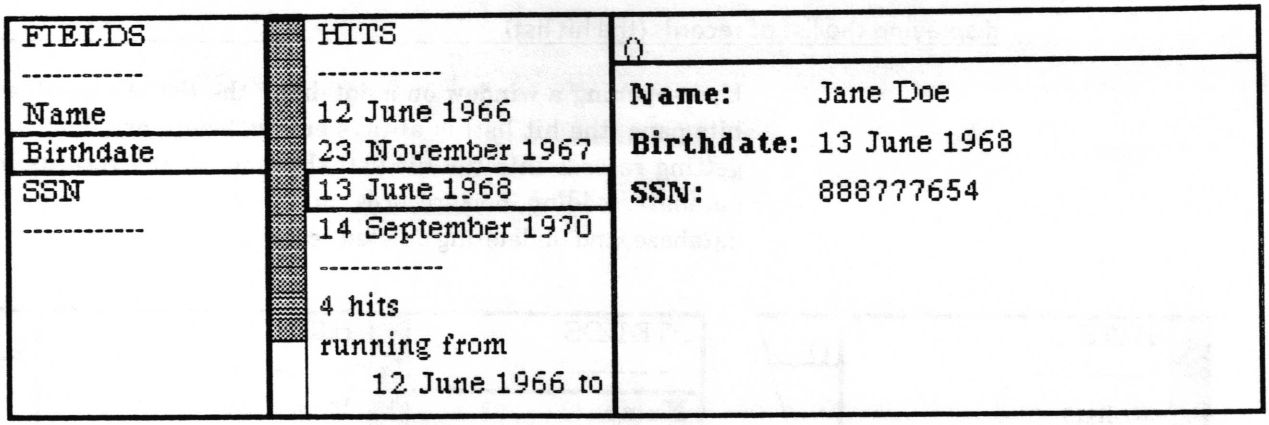
For information on the other three methods of adding to the hit list, see the sections below on "entering a new record", "querying a database", and "deleting a record".

viewing a particular record or records

To view the contents of a record or records, you must first display it or them in the hits pane (see above). This will allow you to see the contents of one field at a time for all the records.

To see the contents of all the fields of a record, use the left mouse button to select that record in the hits pane. Its contents will be displayed in the record editing pane to the right.

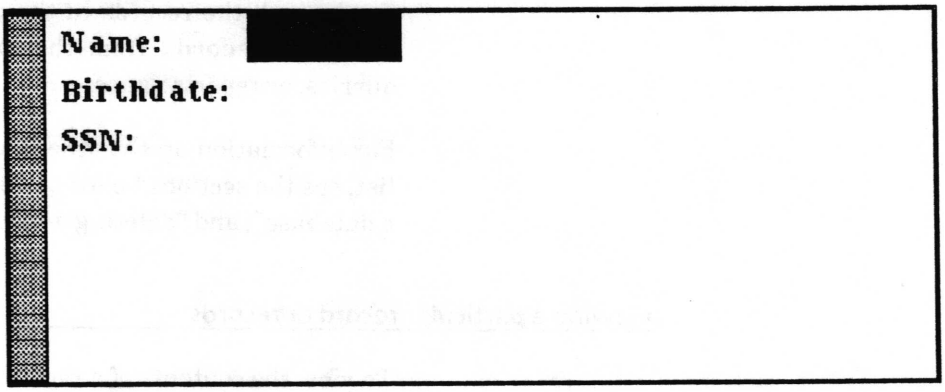
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If you want to display the contents of that record at the same time as another record, you can spawn it off into another window by selecting **spawn record** from the middle button menu in the hits pane. You will be presented with an origin cursor to frame the window on the screen. (This spawned record window is actually a Form window with elements special to database records. You can edit the record or create new records in this database from it. You can also modify the way the fields are displayed in it and save those modifications to be used in displaying all records spawned from this database in the future. See the section below on "form based record entry and editing".)

entering a new record

To enter a new record into the database you must first display the record format in the record editing pane, either by selecting an existing record in the hits pane or by selecting **blank record** in the middle button menu of the record editing pane.



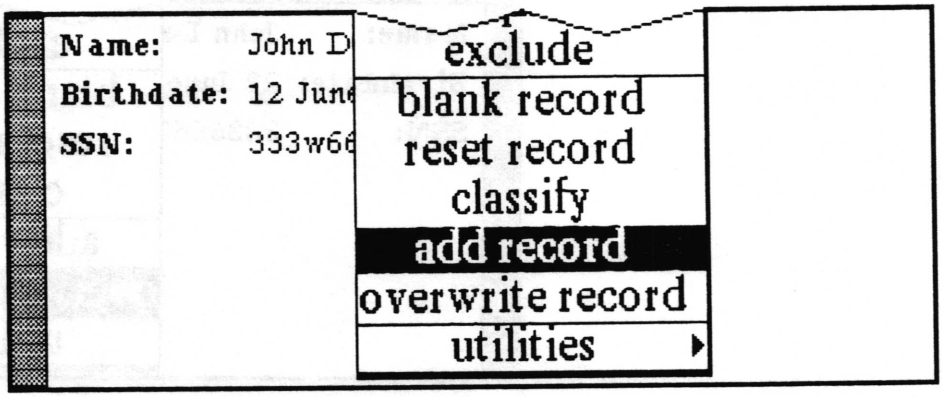
The data for each field in the record will be displayed to the right of the field name. All the fields in the database will be displayed in the same order as in the fields pane. The field identifiers appear in boldface and cannot be edited or deleted.

Fill in the contents of the fields in the record editing pane. The text of the data within each field is entered and edited in

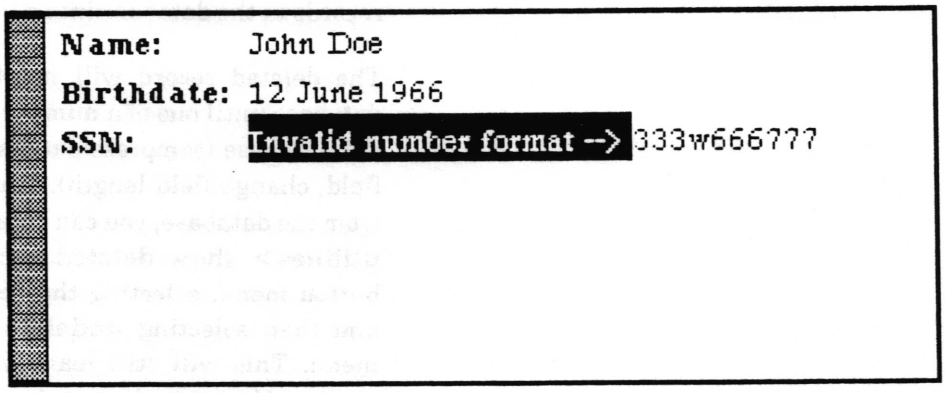
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basically the same way as all text in Analyst – by typing, and using **copy**, **cut**, and **paste** from the middle button menu. You cannot, however, cut or paste more than the contents of one field at a time.

You can move from field to field most easily by using the tab key. The tab key will cause the text selection to jump to the next field, so that whatever you type after it will replace anything that was in the field. Holding down the left shift key while striking the tab key will cause the text selection to jump to the previous field. The carriage return key will move the text selection to the beginningof the next field. (Note that this means you cannot put carriage returns or tabs in the text of fields using the record editing pane.)



When you have finished entering the data, select **add record** from the record editing pane's middle button menu. If the Database does not find something obviously wrong with it, the new record will be added to the database and displayed on the end of the hit list in the hits pane. If it does find something wrong with it, such as a non–number in a number field, the record editing pane will flash and an error message will be inserted at the beginning of the troublesome field.

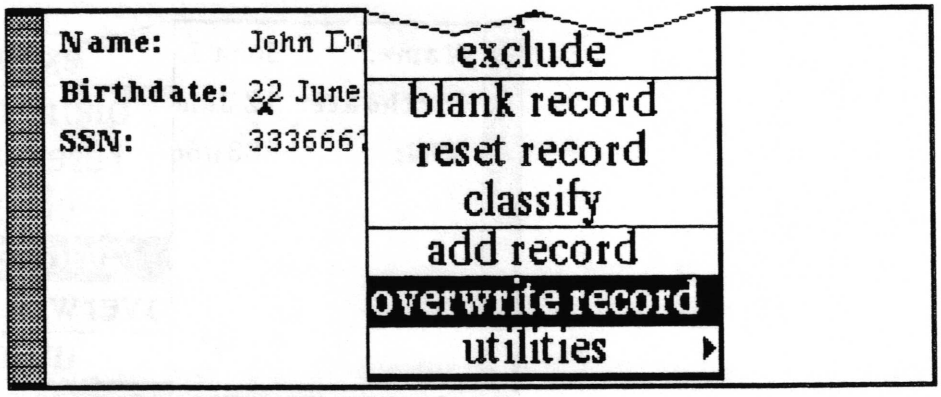


An alternative method of adding records, which you may find more desirable, is discussed in the "form based record entry and editing" section below.

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editing an existing record

To edit an existing record you must first display the record in the record editing pane by selecting it in the hits pane. After changing the contents of the fields as desired, select **overwrite record** from the record editing pane's middle button menu. If the Database does not find something obviously wrong with it, the record will be overwritten and its display in the hits pane updated. If it does find something wrong with it, such as a non-number in a number field, the record editing pane will flash and an error message will be inserted at the beginning of the troublesome field. The original record will remain unchanged.



An alternative method of editing records, which you may find more desirable, is discussed in the "form based record entry and editing" section below.

deleting a record

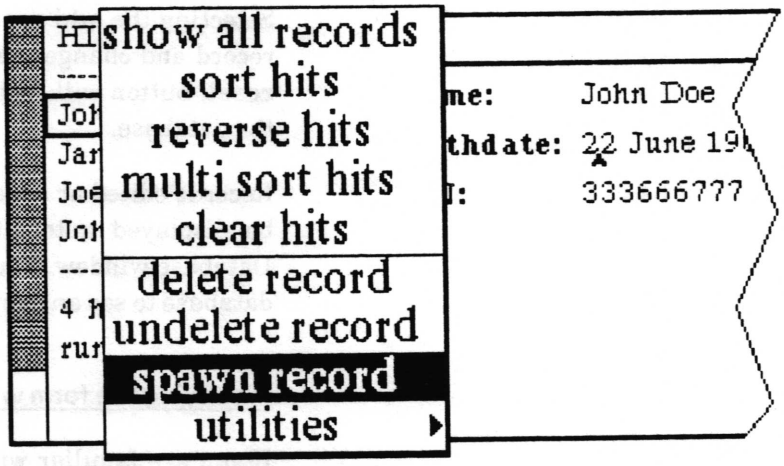
To delete an existing record, select it in the hits pane and then select **delete record** from the hit pane's middle button menu. The record will be marked for deletion and moved from the list of records in the database into a list of deleted records.

The deleted record will not be physically removed from the database until one of a number of other functions is performed on the database (compress database, add field, delete field, rename field, change field length). Until it has actually been expunged from the database, you can recover the deleted record by selecting **utilities> show deleted records** from the hit pane's middle button menu, selecting the deleted record you wish to recover, and then selecting **undelete record** from the middle button menu. This will still leave you looking at the list of deleted records. You can select **undo query** in the queries pane to return to the previous hit list. Otherwise, you will need to show all records or query the database to get back to a list of non-deleted records.

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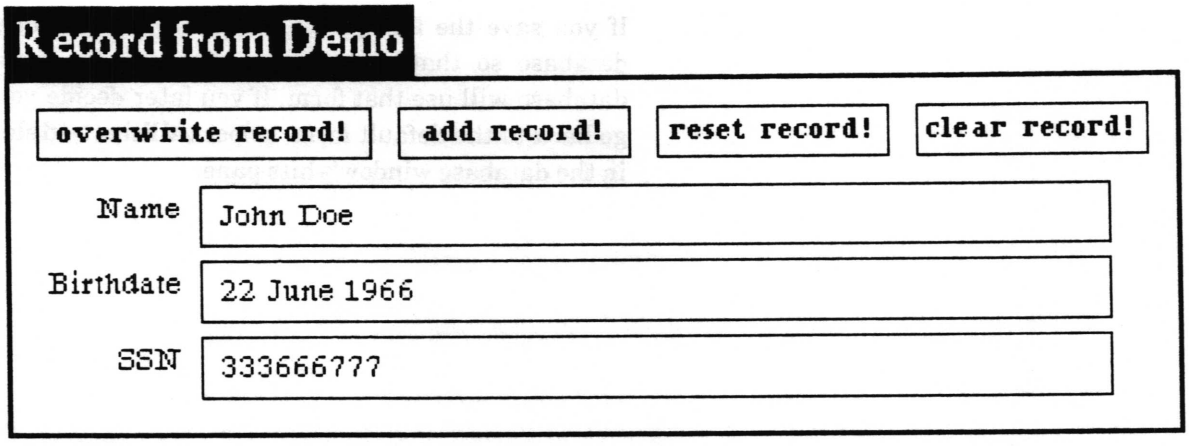
form based record entry and editing

Any record in the database can be displayed and edited in a separate form window by selecting the record in the hits pane and then selecting **spawn record** from the middle button menu. You will be presented with an origin cursor to frame the window on the screen. This spawned record window is actually a Form window with elements special to database records. You can edit the record or create new records in this database from it. You can also modify the way the fields are displayed in it and save those modifications to be used in displaying all records spawned from this database in the future.



editing in the database form window

In the default database form window, each field of the record is contained in a form fill – in box located to the right of a label with the field name. If all the fields cannot be seen at one time in the window, there will be a scroll bar on the left of the window for scrolling vertically. If the window is not wide enough to display the right hand edge of the fields, there will be a scroll bar on the bottom of the window for scrolling horizontally.



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The text within each field is edited separately by selecting within the field's fill-in box and typing, or using copy, cut, and paste. You can move quickly to the first field and from field to field by using the tab key. Typing a tab will move the text selection to include the contents of the next field. A tab typed while the left-shift key is pressed will move the text selection to the previous field. These special database fill-in fields will not allow you to enter text exceeding the defined length of the field – the field will flash and the excess text will be removed immediately.

When the contents of the fields are as desired, selecting the **overwrite record!** button at the top of the form will cause the record originally displayed in the window to be overwritten. Selecting the **add record!** button will add the contents as a new record and change the window to reference the new record. The **reset!** button will redisplay the current contents of the record in the database.

Records edited or added to a database in a form window will not be displayed automatically in the hit list of the originating Database window. You will have to show all records or query the database to see any new records.

modifying the form window

If you are familiar with the Forms tool and know how to edit a form, you can modify the default database form window and save those modifications to be used in displaying all records spawned from this database in the future.

The easiest modifications involve simply moving the fields around, changing their shape, deleting irrelevant fields, or disabling fields to prevent modification. You can also change the element type by deleting the original element for a field and adding another of the desired type – but you must be sure that the name of your new field matches exactly the name of the old field.

If you save the form, it is written to a file connected with the database so that all records subsequently spawned from the database will use that form. If you later decide you would rather go back to the default form, select **utilities> delete entry form** in the database window's hits pane.

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field specifications

The fields of the database are specified in the fields pane. Each field has a name, a length, and a type.

name The name may contain any combination of upper or lower case letters in the alphabet, the numerals 0 through 9, and hyphens. Any illegal character you enter will be replaced with a hyphen. No two fields in a database can have the same name.

length The length defines the maximum number of characters in the field.

type The type must currently be a string, number, date, or time.
The *string* type is the most general – anything you can type is allowed in a string.
A *number* may contain only any combination of the numerals 0 through 9, up to one decimal point, and a negative sign (hyphen) in front if desired.
A *date* consists of a day, month, and year. It may be entered in several formats, but currently will always be displayed from the database in the format *23 December 1987*. If no date is entered in a date field, the Database will display it as *unknown date*.
A *time* consists of hours, minutes, seconds, and *am* or *pm*. It can be entered in 24 hour format, but will always be displayed as *hh:mm:ss am* or *hh:mm:ss pm*. If no time is entered in a time field, the Database will display it as *unknown time*.

viewing or changing database field specifications

The middle button menu in the fields pane is used to manipulate the database field specifications.

To view the current specifications of a field, use the left mouse button to select the field in the fields pane and then select **definition** from the middle button menu. A notifier containing the information will appear and remain until you click a mouse button. You can view the specifications of all the fields at once by selecting **all definitions** in the middle button menu.

To add a new field, select **add** from the middle button menu in the fields pane. A **Field Entry** QBox will appear. After filling it out and accepting it, the new field will be added to the end of the list of fields. (You cannot add a field between or above existing fields).

To delete a field, use the left mouse button to select the field in the fields pane and then select **delete** from the middle button

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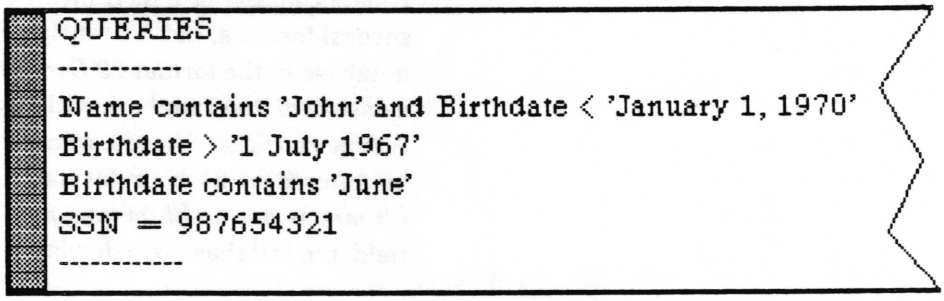
menu. A confirmer will appear for you to verify that you really did want to delete it.

To change the name of a field, use the left mouse button to select the field in the fields pane and then select **rename** from the middle button menu. A prompter will appear for you to enter the new name.

To change the length of a field, use the left mouse button to select the field in the fields pane and then select **change length** from the middle button menu. A prompter will appear for you to enter the new length.

querying the database

The queries pane is used to query (filter) the records in the database or hit list into some subset. The pane may contain a list of queries which have already been created and are ready for use. A query may be invoked against either the entire database or just the records in the hit list.



using an existing query

To query the entire database, select the desired query from the query list with the left mouse button and then select **query** from the middle button menu.

To query against the hit list, select the desired query from the query list with the left mouse button and then select **query hits** from the middle button menu.

When the query has finished, the records that match the requirements of the query are displayed in the hit list.

undoing a query

If you find that the results of a query are undesirable, you can return the hit list to its previous state by selecting **undo query** in the middle button menu of the queries pane.

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syntax of a query

The syntax of a query consists of one or more expressions. An expression consists of a field name, an operator, and a value; for instance:

Name contains 'John'.

If there is more than one expression, they are connected by one of the boolean operators: *and*, *or*, or *xor* (exclusive or); for instance:

Name contains 'John' or Name contains 'Bill'.

Multiple expressions are always evaluated left to right, there is no precedence among the boolean operators; for instance:

Name contains 'John' or Name contains 'Bill' and: Age < 25

would be evaluated as if there were parenthesis:

(((Name contains 'John') or (Name contains 'Bill')) and (Age < 25)).

These are the available operators:

<	less than
>	greater than
=	equal to
< =	less than or equal to
> =	greater than or equal to
~	not equal to
contains	includes
~contains	does not include
doesntcontain	does not include

In general, for string type fields you will only want to use *contains* or *~contains*. The other six operators will likely yield unexpected results for strings. For instance, if *Name* is a string field of length 20, and the value of the field looks like *John Doe*, then:

Name contains 'Doe'	evaluates true
Name contains 'doe'	evaluates false because case matters
Name = 'John Doe'	evaluates false because there are actually 12 spaces following John Doe in the field

The boolean operators are:

exp1	exp2	and	or	xor
true	true	true	true	false
true	false	false	true	true
false	true	false	true	true
false	false	false	false	false

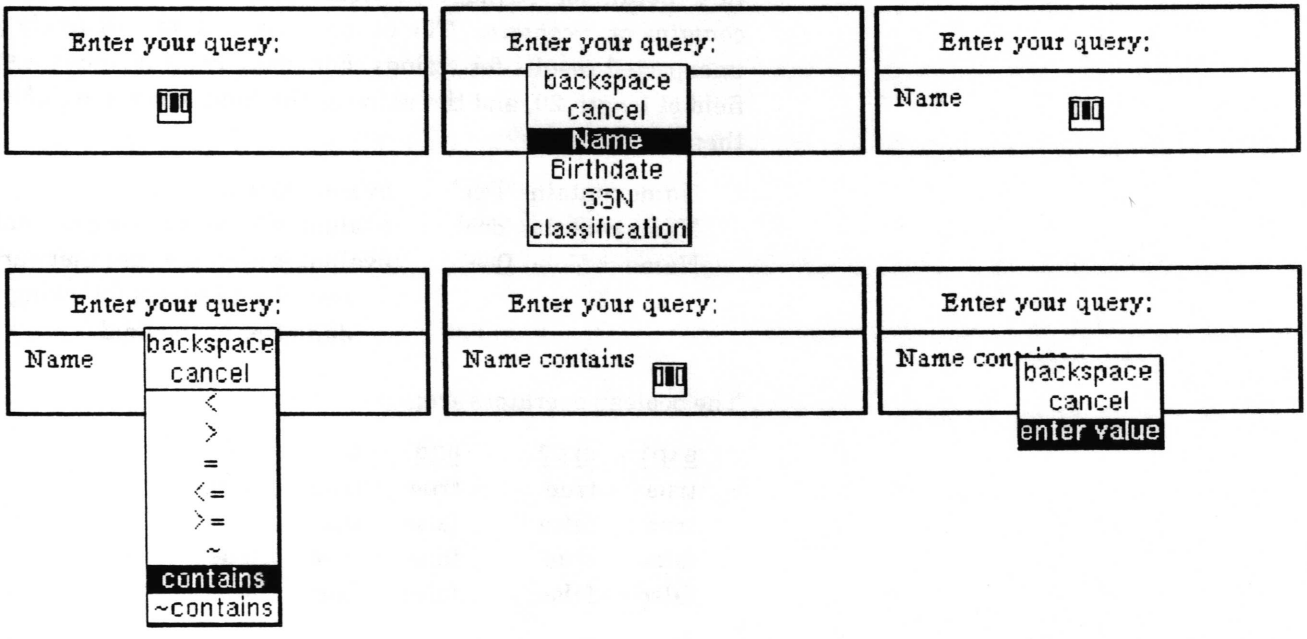
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creating a query

A query can be created in two ways. It can be added to the list of queries in the queries pane for repeated use by selecting **add** from the middle button menu in the queries pane, or it can be made, used, and discarded by making sure no query is selected (clicking the left mouse button while the cursor is over a selected query will deselect it) and then selecting **query** or **query hits** from the middle button menu.

In either case, a querier will appear to guide you through the creation of the query. It works by providing you a popup menu with only valid choices at each step in the process of creating the query. Two choices appear at the top of every menu – backspace and cancel. If at any point in the creation of your query you wish to forget the whole thing and get out of the querier, select cancel on the popup. If you want to go back and do the last step over again, select backspace on the popup. At the end of creating each expression, ACCEPT will appear on the popup. If you are finished creating the query, select ACCEPT.

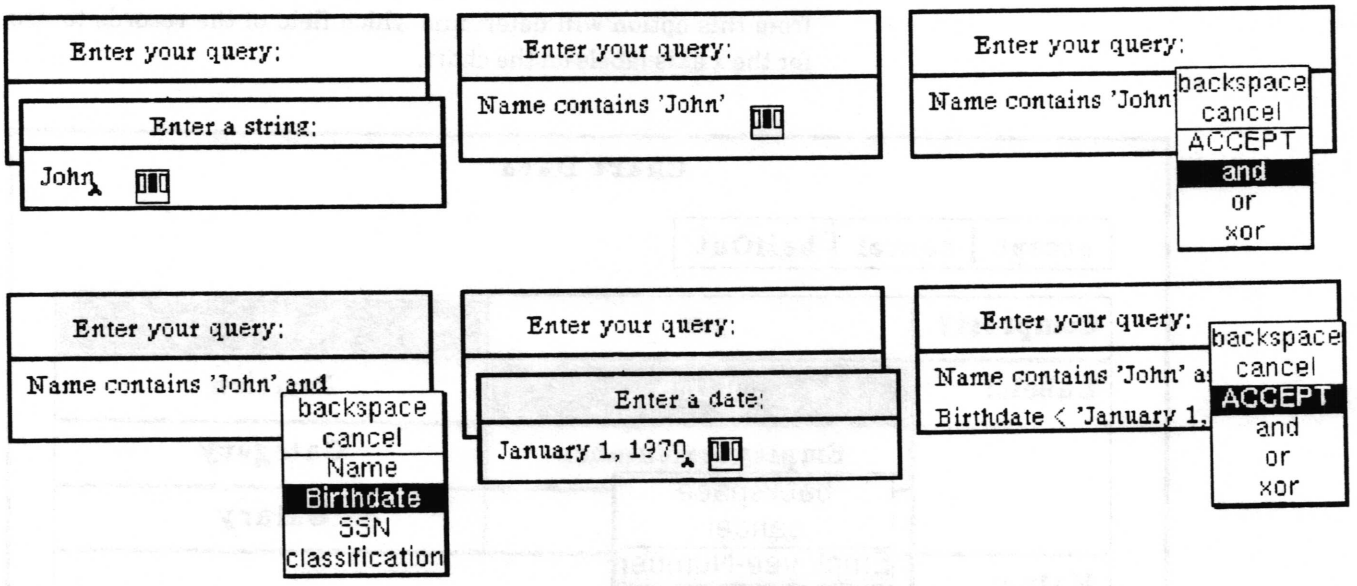
Here is an example of the creation of the query
Name contains 'John' and: Birthdate < January 1, 1970.
After the querier appears, press the middle mouse button. You will see that below the horizontal line in the menu is a list of the field names. Select a field name – in our example we will select Name. The field name appears in the querier.



Press the middle mouse button again and a popup menu containing the allowable operators appears. Select one of the operators – in our example we select contains. The operator appears in the querier after the field name. Pressing the middle

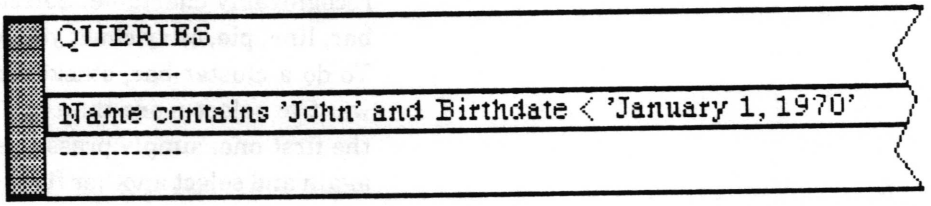
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mouse button again brings up a popup menu from which we select enter value and a prompter appears. After typing in the value John and hitting the return key to accept it, the value appears in the querier. The first expression is now complete. Pressing the middle button again we see that the popup now has the option to ACCEPT or to put in one of the boolean operators to link to another expression. In our example we select and.



The second expression is now entered in the same manner as the first was, starting with entering the field name Birthdate. After entering the value at the end of the second expression we are finished entering the query and therefore select ACCEPT from the popup menu.

If we had started the whole process by selecting **add** in the queries pane's middle button menu, the query will now appear in the query list, otherwise the query will be invoked immediately.

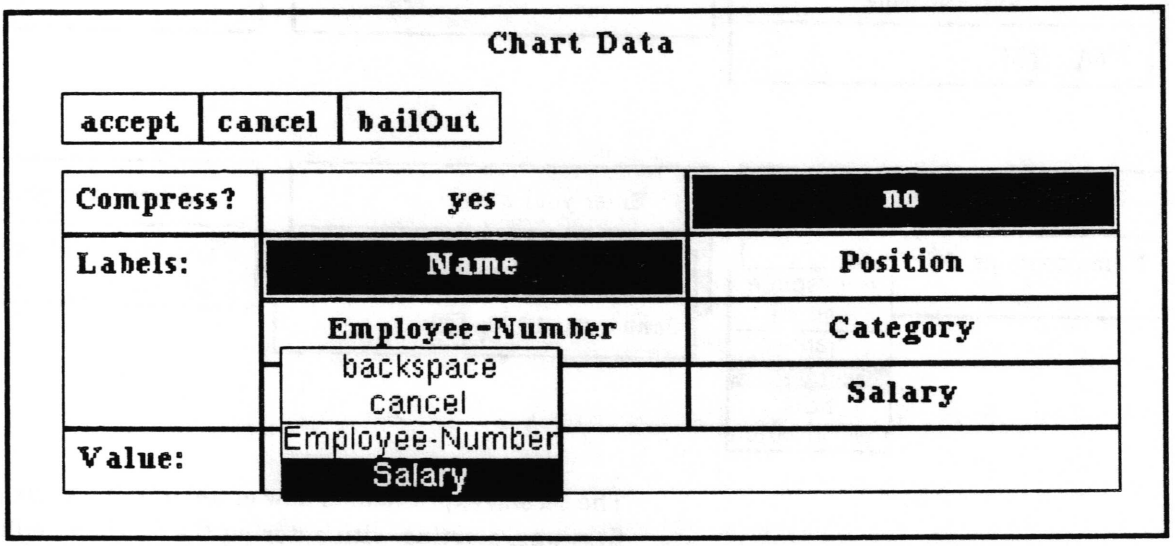


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generating a chart from the database

To generate a chart from data in the records in the hit list, select **utilities> chart data** from the middle button menu in the hits pane. The **Chart Data** QBox will appear. Here you must choose how to label the chart, what value(s) are to be assigned to them, and whether the information should be compressed.

Select one of the field names listed after **Labels:**. The selection from this option will determine which field of the records to use for the x axis labels on the chart.



The **Value:** option of the QBox is a querier which will allow you to select one or more of names of fields of number type. Press the middle mouse button inside the box to the right of **Value:** to obtain a menu of options. At the top of the menu will be backspace (will undo the last selected value) and cancel (removes all the values from the list). Below them is a list of the numeric fields to choose from. If there are none, your data is not recognizably chartable. Select a field name. If you are making a bar, line, pie, or xy chart you will want to use just one value field. To do a cluster bar, stacked bar, or stacked line chart, you will want to select more than one value field to use. After selecting the first one, simply press the middle button to obtain the menu again and select another field.

The **Compress?** option of the QBox is asking whether to sum or group like items into one comprehensive item. In other words, if yes is selected it will sum the values of any labels that are the same and present the total as the value with just one label.

Before compression:

Label	Value
Region A	100
Region B	200
Region A	300

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After compression:

Label	Value
Region A	400
Region B	200

When you have filled in the QBox and selected **accept**, the origin cursor appears in order for you to frame the chart to your desired size. After the chart is framed and you've released the left mouse button, another origin cursor appears. This represents the top left corner of the complete Chart Editor window, and this time it is prompting you to locate the window on the screen. Click the left mouse button once to place the window upon the screen.

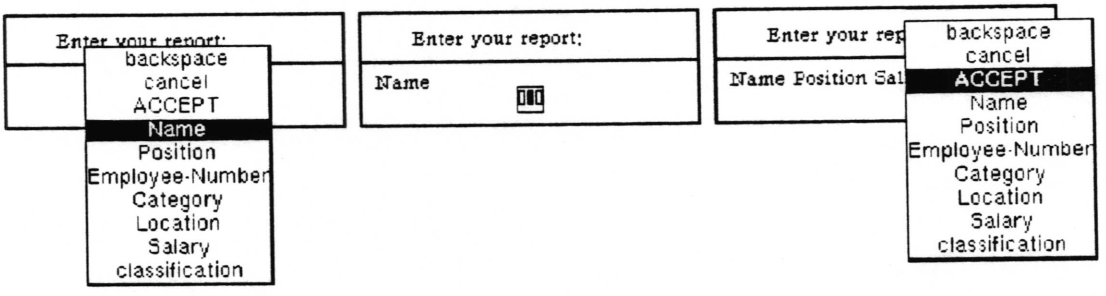
For details on using the Chart Editor, see the *Chart Editor* chapter of the Analyst User Guide.

generating a report from the database

The reports pane is used for generating columner reports from a database. You select, in order, the fields you want to see as columns in the report and provide a maximum width in inches for each column. It then composes the data, placing line breaks and tabs as necessary to get the data of each field properly in its column, and finally opens a document window on the result. You can then either add the rest of your report around it, or copy the result to wherever it is needed.

adding a report format to the list

The pane may contain a list of report formats which have already been created and are ready for use. To add a report format to the list, select **add** from the report pane's middle button menu. A querier will appear. Press down the middle mouse button to obtain a popup menu containing the field names in the database. Select the field you want to provide the data for the first column in the report. It will appear in the querier. Press the middle button again and select the field to appear in the next column. If you make a mistake, you can go back one selection by using backspace from the menu, and forget the whole thing with cancel. You may repeat a field if you wish. When you have entered all the columns, select ACCEPT from the popup. The list of fields will appear as a line in the reports pane.



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creating the report

Only the records currently in the hits pane are used for reporting; to get a report of the whole database, select **show all records** from the middle button menu. If you want to use a report format from the list in the reports pane, select it.

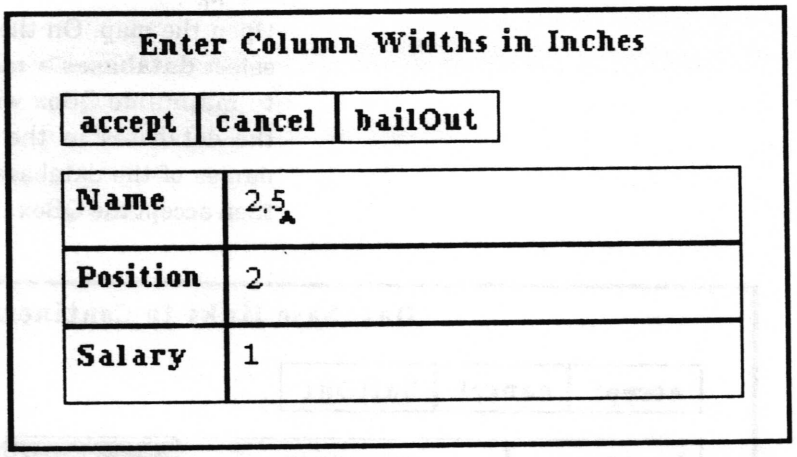


Select **make report** from the middle button menu in the reports pane. It will then ask you for the orientation of the report – portrait or landscape. This is just used to determine which orientation of Document to make. Next, a **Maximum Classification Level** QBox appears. It will display the classification of the database. By selecting a lower classification you may exclude any records with a higher classification from the report. Accept the QBox to proceed with the report.

If you did not select an existing report format to make a report from, a querier for entering the fields to be output will now appear. See "adding a report format to the list" above for details on its use.

Next, an **Enter Column Widths in Inches** QBox appears which enables you to set the width in inches for each field's column. You may enter fractions of an inch by using decimal numbers. When you've finished setting the desired width(s), accept the QBox.

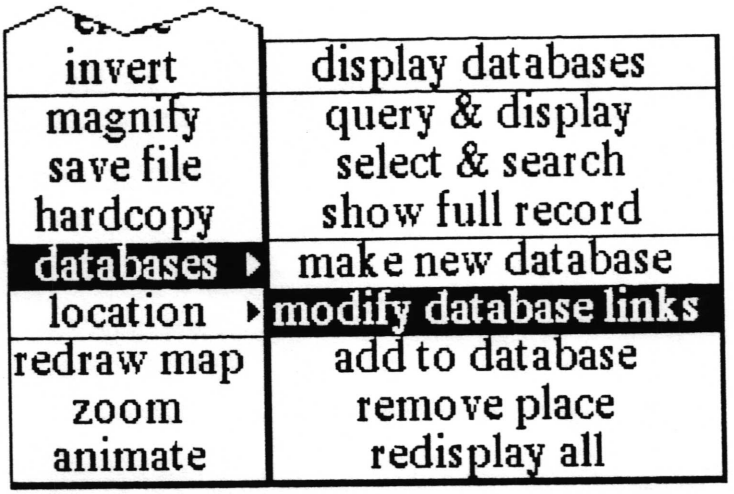
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After it thinks for awhile (depending on how big and/or complex the report is), it will prompt you to frame the document window containing the results. Each record will be in a separate paragraph. The tab stops have been located at exactly the widths you gave as the maximum column widths, but you may find it desirable to move them a bit farther apart and/or change the tab stop alignment. The text will all be in the default system font. You may change the font, but be aware that you may have to adjust the tab stops and move line breaks around to make it look good afterwards. For details on using the Document window, see the *Document* chapter of the Analyst User Guide.

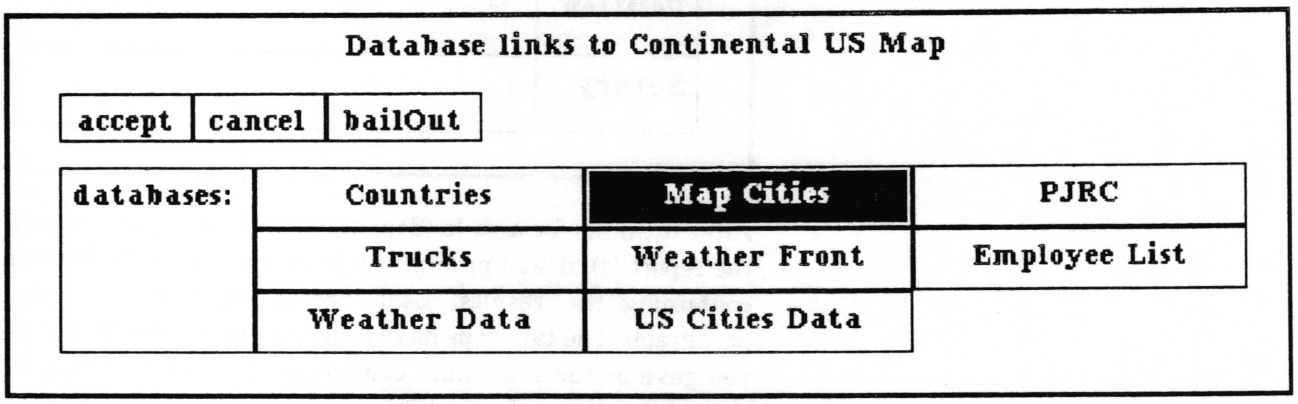
linking databases to maps

Databases with the necessary fields for use with maps (latitude, longitude, etc. – generally created from a map editor or from another map database) must be linked to a map in the same Information Center before the map can access data in it. There are several ways of linking a database to a map, but the easiest is from the middle button menu of the Map Editor editing pane.



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Open the map. On the middle button menu in the editing pane, select **databases> modify database links**. A **Database links to mapname** QBox will appear which contains the names of all the databases in the Information Center. Select (darken) the names of the databases you want to be linked to the map, and then accept the QBox. The link is now made.

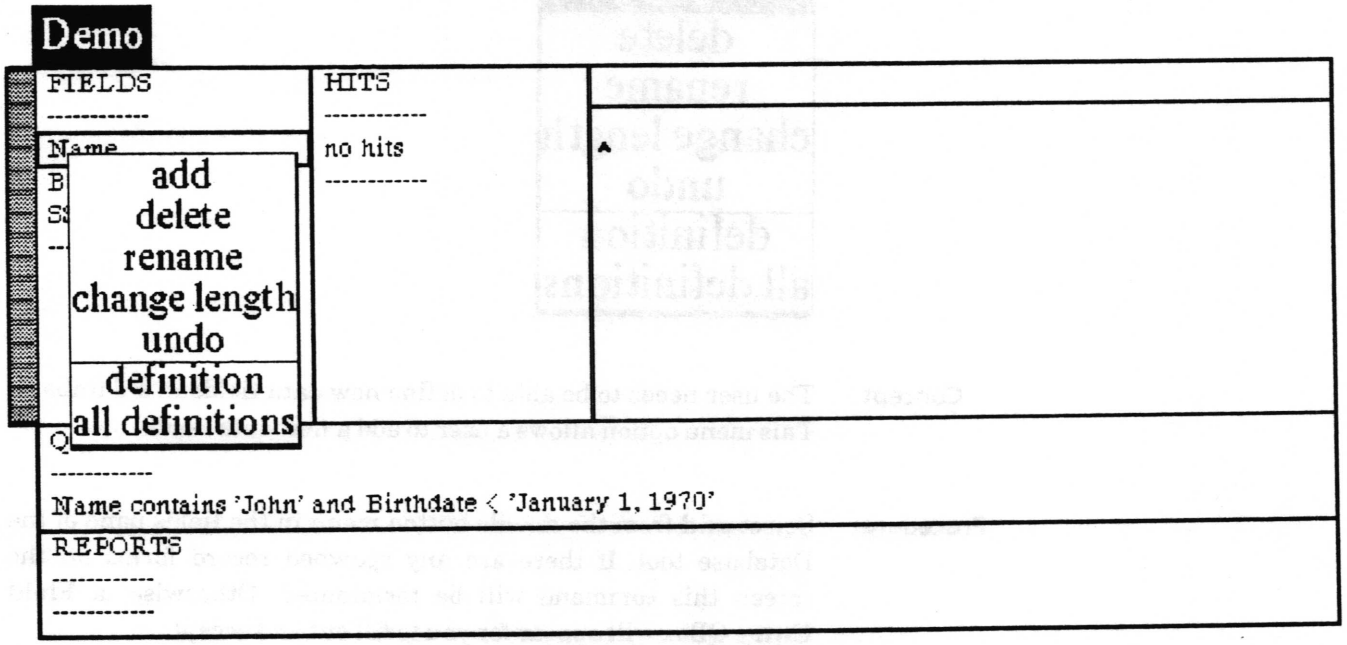


using a database in a spreadsheet

Data from a database can be used in a spreadsheet. To do this, one cell of the spreadsheet needs to contain a "SSDataBase" object that references the database. To make this object, select the database item in an Information Center folder and copy it. Then go to the cell in the spreadsheet and select paste. You should see a value appear that looks something like "SSDataBase on: 'mydatabase.db– +1'. Other cells that want information from the database will have rules which refer to that cell. See the *Spreadsheet* chapter for details.

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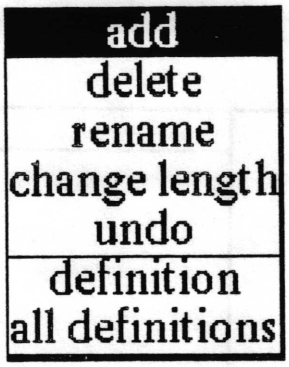
Fields pane middle mouse button menu



Following in alphabetical order is a detailed description of each of the functions available in the middle button menu of the fields pane. This section is intended to be reference material on how each menu choice works.

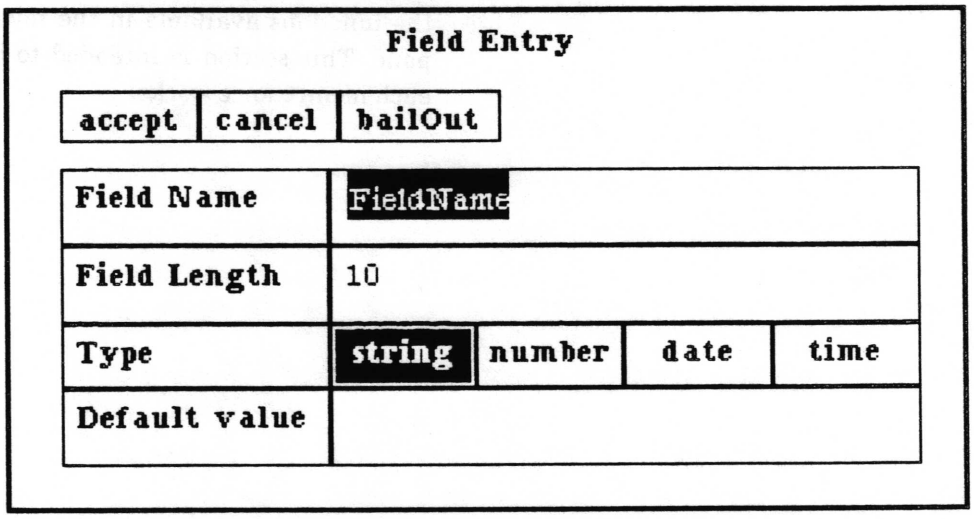
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add



Concept The user needs to be able to define new data fields in a database. This menu option allows a user to add a new data field.

Procedure Select **add** from the middle button menu in the fields pane of the Database tool. If there are any spawned record forms on the screen this command will be terminated. Otherwise, a **Field Entry** QBox will appear for you to fill out and accept.



The entries in the QBox have the following meaning and requirements:

Field Name
The field name may contain any combination of upper or lower case letters in the alphabet, the numerals 0 through 9, and hyphens. Any illegal character you enter will be replaced with a hyphen. No two fields in a database can have the same name.

Field Length
The field length defines the maximum number of characters in the field.

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Type

The field type must currently be one of a string, number, date, or time.

The **string** type is the most general – anything you can type is allowed in a string.

A **number** may contain only any combination of the numerals 0 through 9, upto one decimal point, and a negative sign (hyphen) in front if desired.

A **date** consists of a day, month, and year. It may be entered in several formats, but currently will always be displayed from the database in the format *23 December 1987*. If no date is entered in a date field, the Database tool will display it as *unknown date*.

A **time** consists of hours, minutes, seconds, and *am* or *pm*. It can be entered in 24 hour format, but will always be displayed as *hh:mm:ss am* or *hh:mm:ss pm*. If no time is entered in a time field, the Database tool will display it as *unknown time*.

Default value

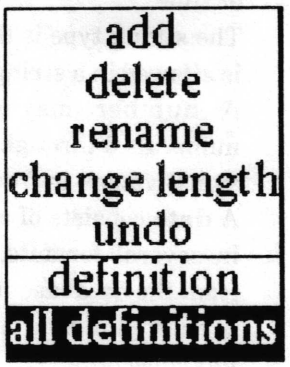
This value will be used as the value of this new field in any existing records. It may be left blank. This is not used for new records that may be created later.

Effect The database as it currently exists will be backed up. The new field defined by your entries in the QBox will be added to the end of the list of fields and it will be added to every record in the database. Deleted records will be expunged from the database. The hits and record editing panes will be reset.

Related topics field specifications, viewing or changing database field specifications

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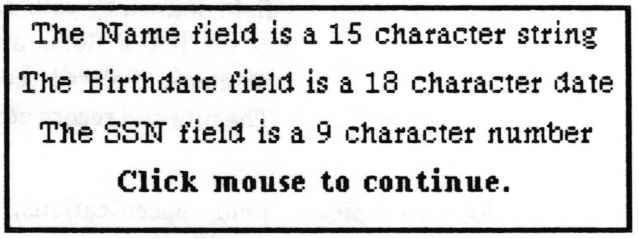
all definitions



Concept It is sometimes very useful to know how the fields of the database are defined. This menu option provides a way to find out.

Procedure Select **all definitions** in the middle button menu of the fields pane.

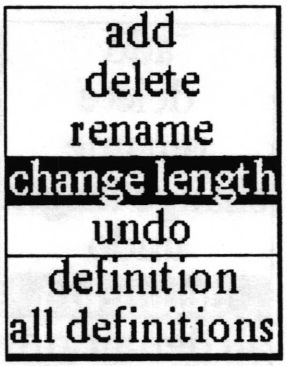
Effect A notifier will appear showing the specifications of each field. Clicking any mouse button will get rid of the notifier.



Related topic field specifications

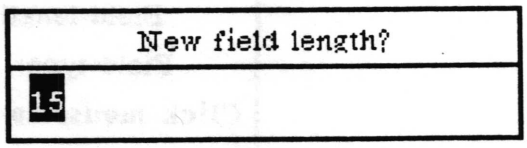
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change length



Concept It is not always possible to know in advance how long the data in a field might be. Having a length much greater than will ever be used is wasteful of disk storage. This menu option allows the length of a data field to be changed.

Procedure Use the left mouse button to select the field in the fields pane you want to change the length of. Then select **change length** in the middle button menu. If there are any spawned record forms on the screen this command will be terminated. Otherwise, a prompter, containing the current length as a default, will appear for you to enter the new length. Type the new number followed by a carriage return.

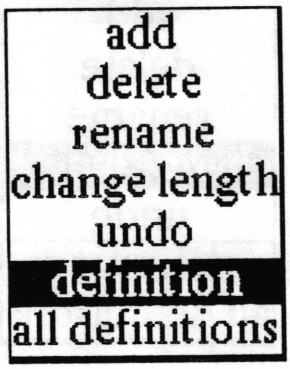


Effect The database as it currently exists will be backed up. The length of the field will be changed to the new length. Every record in the database will be rewritten using the new length for that field. If the new length is less than the old length and the data in that field of a record is longer than the new length, the data will be truncated to fit in the new length. Deleted records will be expunged from the database. The hits and record editing panes will be reset.

Related topics field specifications, viewing or changing database field specifications

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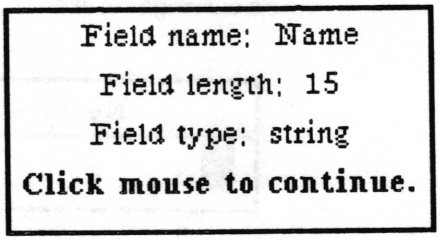
definition



Concept It is sometimes very useful to know how the field of the database is defined. This menu option provides a way to find out.

Procedure Use the left mouse button to select the field you want to know the definition of. Then select **definition** in the middle button menu of the fields pane.

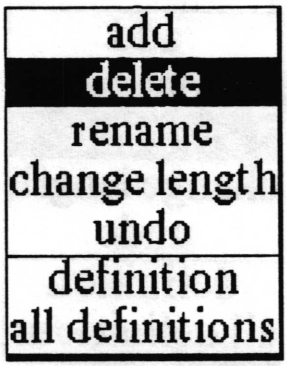
Effect A notifier will appear showing the specification of the field. Clicking any mouse button will get rid of the notifier.



Related topic field specifications

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delete



Concept It is sometimes desirable to delete a data field from a database. This menu option provides the capability to delete a field.

Procedure Use the left mouse button to select the field you want to delete. Then select **delete** in the middle button menu of the fields pane. If there are any spawned record forms on the screen this command will be terminated. Otherwise, a confirmer will appear for you to verify that this is what you really want to do.

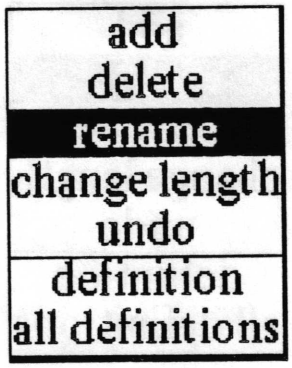
Deletion will permanently destroy the contents of this field. Are you sure you want to delete it?	
yes	no

Effect The database as it currently exists will be backed up. The field will be removed from the list of fields and from every record in the database. Deleted records will be expunged from the database. The hits and record editing panes will be reset.

Related topics field specifications, viewing or changing database field specifications

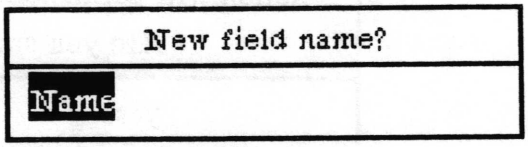
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rename



Concept This menu option provides the capability to change the name of a data field.

Procedure Use the left mouse button to select the field you want to rename. Then select **rename** in the middle button menu of the fields pane. If there are any spawned record forms on the screen this command will be terminated. Otherwise, a prompter will appear for you to enter the new name for the field. After typing in the new name, type a carriage return to accept it.

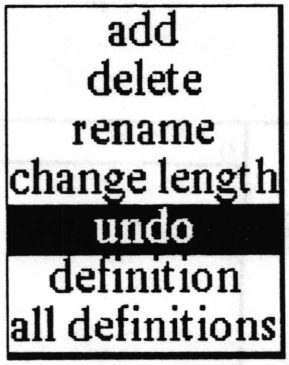


Effect The database as it currently exists will be backed up. The field will be renamed. Deleted records will be expunged from the database.

Related topics field specifications, viewing or changing database field specifications

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undo



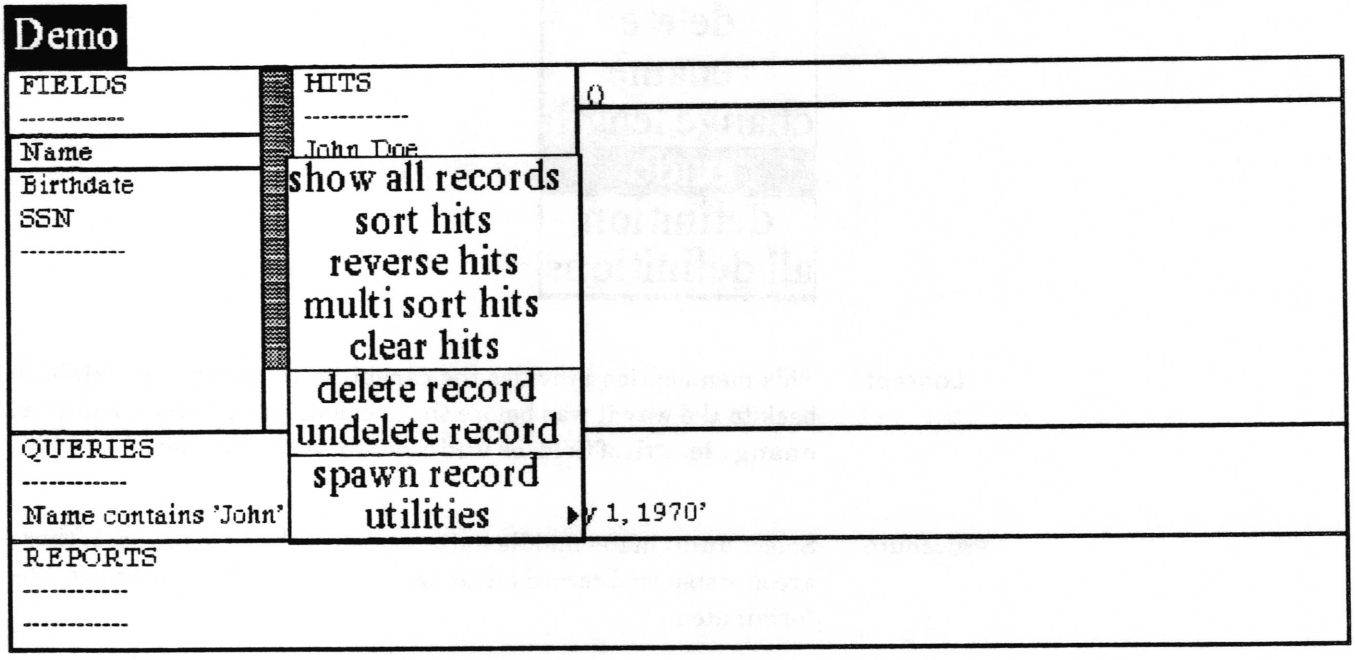
Concept This menu option provides the capability to change the database back to the way it was before the previous **add**, **delete**, **rename**, **change length** of field, or **undo** option was performed.

Procedure Select **undo** in the middle button menu of the fields pane. If there are any spawned record forms on the screen this command will be terminated.

Effect If a backup file exists, the database as it currently exists will be switched with it. Selecting undo a second time will switch them back again.

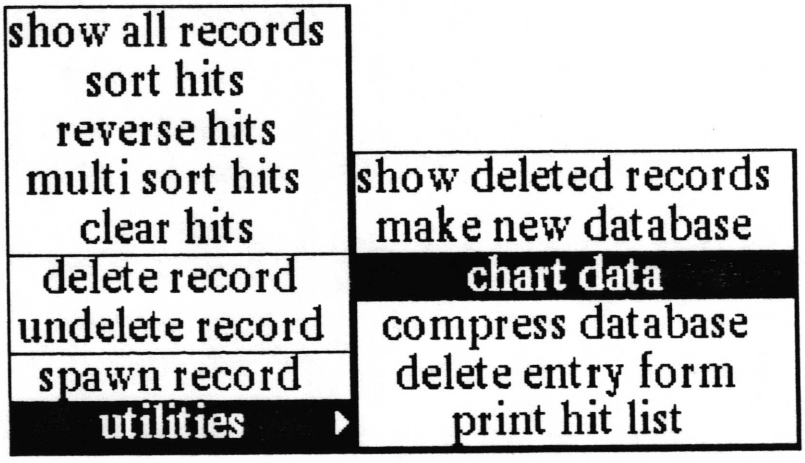
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Hits pane middle mouse button menu



Following in alphabetical order is a detailed description of each of the functions available in the middle button menu of the hits pane. This section is intended to be reference material on how each menu choice works.

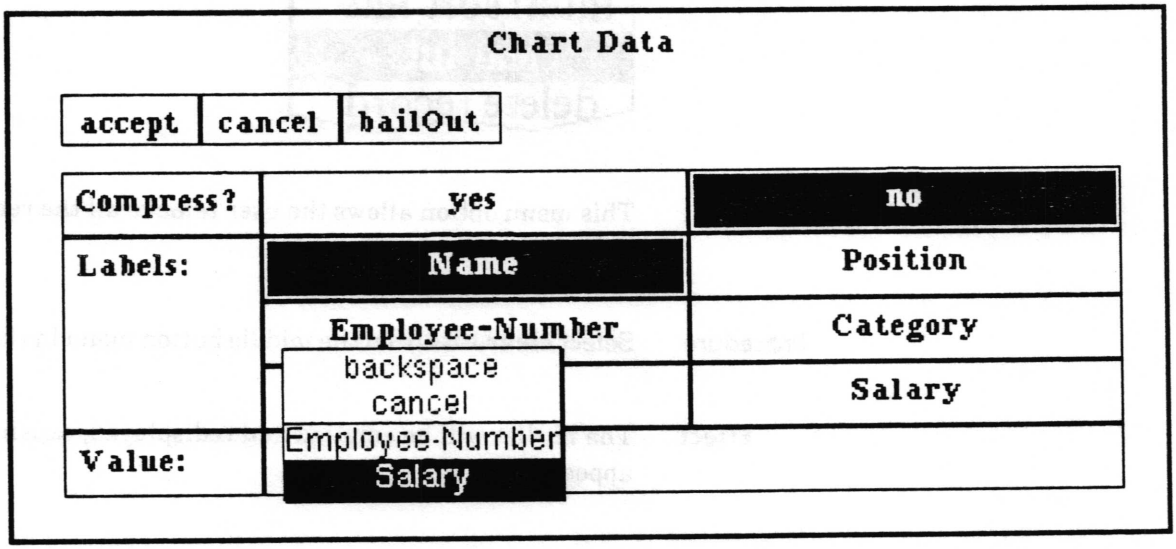
chart data



Concept This menu option allows the user to move data directly from records in the database to a Chart Editor for generation of a chart.

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Procedure Put the records whose data you want to chart in the hit list displayed in the hits pane. Select **utilities > chart data** from the middle button menu in the hits pane. The **Chart Data** QBox will appear. Here you must choose how to label the chart, what value(s) are to be assigned to them, and whether the information should be compressed.



For more details on filling out this QBox, see "generating a chart from the database" in the "Database usage" section of this chapter.

When you have filled in the QBox and selected **accept**, the origin cursor appears in order for you to frame the chart to your desired size. After the chart is framed and you've released the left mouse button, another origin cursor appears. This represents the top left corner of the complete Chart Editor window, and this time it is prompting you to locate the window on the screen. Click the left mouse button once to place the window upon the screen.

For details on using the Chart Editor, see the *Chart Editor* chapter of the Analyst User Guide.

Effect Data from the specified fields of the records in the hit list is transferred to a Chart Editor tool for creation of a chart.

Related topics Chart Editor, generating a chart from the database

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clear hits

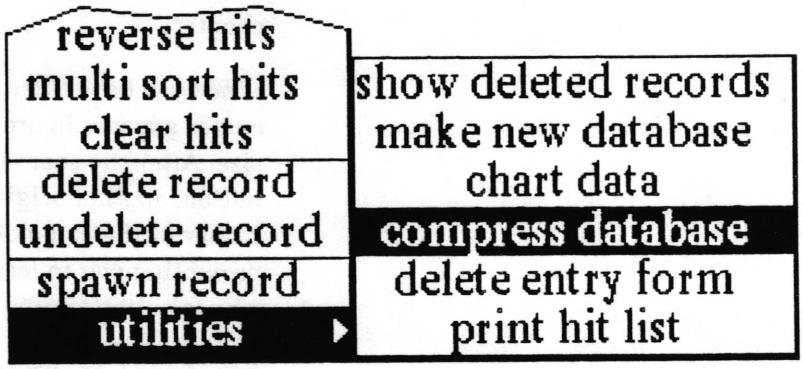


Concept This menu option allows the user remove all the records from the hit list.

Procedure Select **clear hits** from the middle button menu in the hits pane.

Effect The hit list will be emptied and redisplayed, causing "no hits" to appear in the hits pane

compress database



Concept Deleting records from the database moves them to the list of deleted records, it does not remove them from the database file. This menu option provides a way to expunge the deleted records from the database.

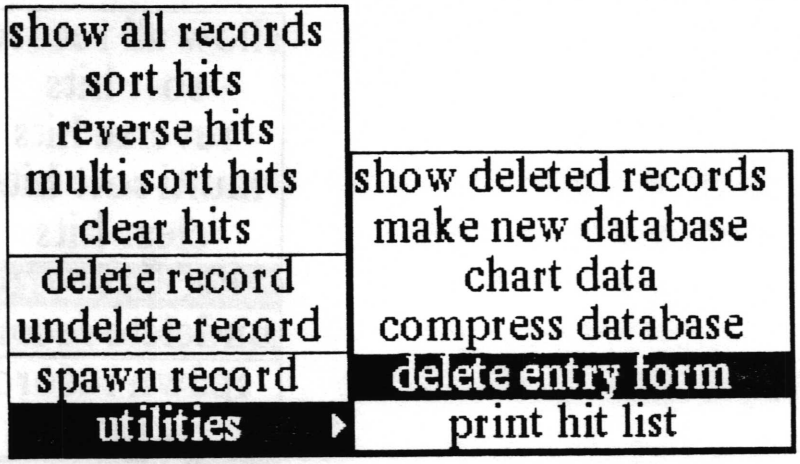
Procedure Select **utilities> compress database** from the middle button menu in the hits pane.

Effect The database file will be rewritten without any deleted records and the classification will be recalculated.

Related topics deleting a record, delete record, show deleted records

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delete entry form



Concept If you modify the default database entry form window and save it, all records subsequently spawned from the database will use that form. This menu option deletes the modified form so that subsequently spawned windows will use the default database entry form.

Procedure Select **utilities> delete entry form** from the middle button menu in the hits pane.

Effect Any saved database entry form will be deleted so that subsequently spawned records will use the default form.

Related topic form based record entry and editing, spawn record

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delete record



Concept This menu option allows the user to delete records from the database.

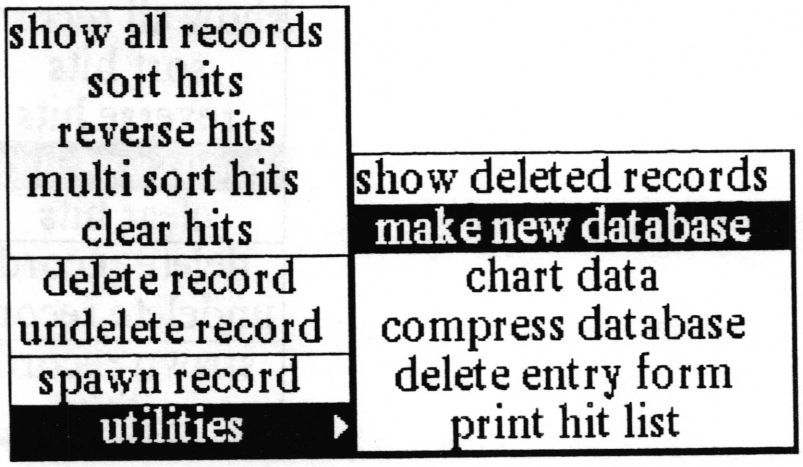
Procedure Get the record to be deleted into the hit list. In the hits pane, use the left mouse button to select the record to be deleted. Select **delete record** from the middle button menu in the hits pane.

Effect The record will be marked for deletion and moved from the list of records in the database into a list of deleted records.

Related topics deleting a record, show deleted records, undelete record, compress database

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make new database



Concept This menu option allows the user to create another database with the same field definitions and only the records in the current hit list.

Procedure Show whatever records you want to move into the new database in the hit list. Select **utilities> make new database** from the middle button menu in the hits pane. A **File request** QBox will appear to request the information necessary for creating the new database and filing it in one or more Information Centers. After filling out the QBox and selecting **accept,** the newly created database will be filed in the designated Information Center(s).

Effect A new database containing the records in the hits list in the order they appear in the hits pane is created and filed in one or more Information Centers.

Related topics displaying the list of records (the hit list), creating a new database from another database

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multi sort hits



Concept It is useful, especially for report creation, to be able to sort the list of records. This option provides for sorting against multiple fields.

Procedure Select **multi sort hits** from the middle button menu in the hits pane. A querier will appear. In the middle mouse button menu of the querier is a list of all the field names. Select the name of the first field to sort the contents of. The middle mouse button menu will now contain a choice of **ascending** or **descending**. Select **ascending** to sort the contents of that field alphabetically with a < b. Select **descending** to obtain the reverse order. You can now select from the middle mouse button menu either another field to sort against or you can select **accept** to start the sorting. If you do select a second field name, it will be used to sort the records in which the first field selected are equal. A third field would sort those records in which the first two fields were equal, and so on.

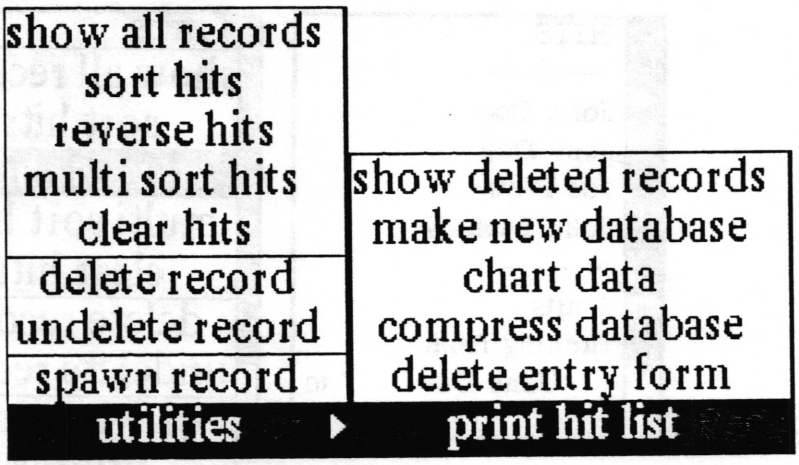
Effect The hit list will be sorted according to the specified list of fields and redisplayed in the hits pane. In the example below, the records shown are sorted by age ascending, weight descending, name ascending.

name	age	weight
Jack	20	220
Joe	20	220
Jerry	20	215
Jeff	23	221
John	23	210

Related topic displaying the list of records (the hit list)

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print hit list



Concept This provides a way to simply dump the contents of all the records in the hit list plus the field definitions to a hardcopy output.

Procedure Get the records you want to hardcopy into the hit list. Select **utilities > print hit list** from the middle button menu in the hits pane. A standard **Hardcopy** QBox will appear for you to fill out and accept.

Effect Printer format output will be generated which contains the field definistions followed by each record in the hit list in the order in which they appear in the database. The following is an example of the output for two records of a database with two fields.

Contents of: Example
Classification: ()

Field Definitions:
  Name is a 20 character string
  Age is a 3 character number

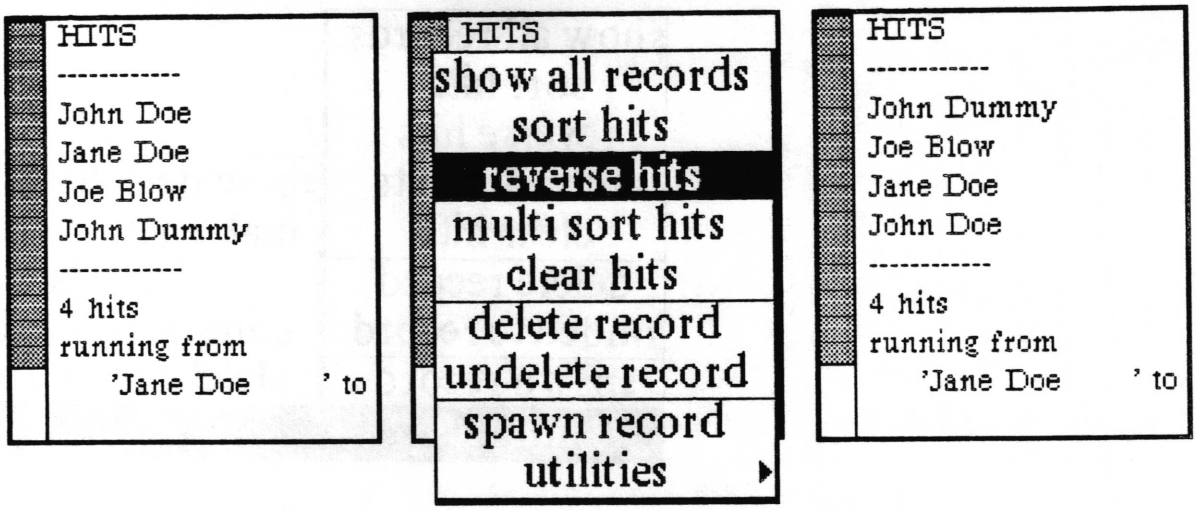
Record: 3
  Classification: ()
Name: Jack
Age: 20

Record: 5
  Classification: ()
Name: Jeff
Age: 23

Related topics make report

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reverse hits



Concept It is sometimes useful, particularly in the creation of reports, to be able to change the order of the records in the hit list. This menu option causes a simple reversal of the order – it would normally be most useful after sorting the hits.

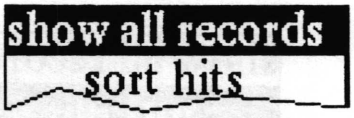
Procedure Select **reverse hits** from the middle button menu in the hits pane.

Effect The order of records in the hit list is reversed and displayed in the hits pane. Reversal means that the first item on the list becomes the last item on the list, the second item on the list becomes the second to the last item on the list, and so on.

Related topics displaying the list of records (the hit list), sort hits

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show all records



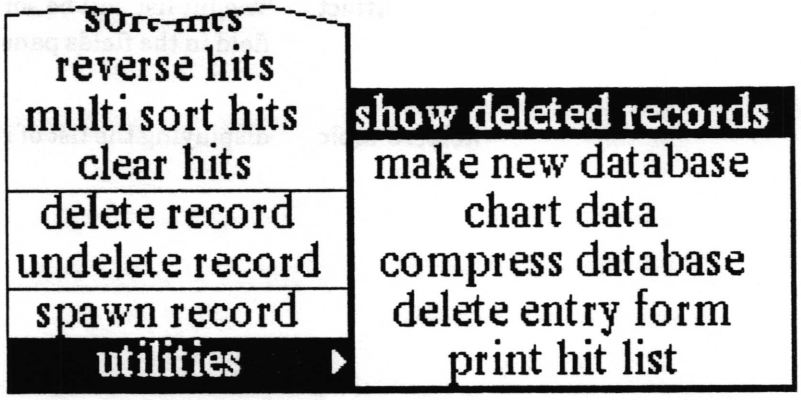
Concept This menu option shows all the undeleted records in the hits pane.

Procedure Select **show all records** from the middle button menu in the hits pane.

Effect All the records in the database that are not deleted are put into the hit list and the data field currently selected in the fields pane is displayed in the hits pane for each of them.

Related topic displaying the list of records (the hit list)

show deleted records



Concept This menu option causes the list of deleted records to be displayed in the hits pane.

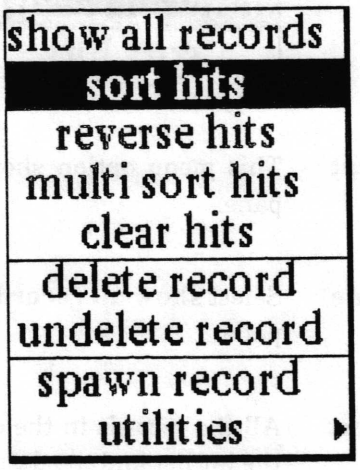
Procedure Select **utilities > show deleted records** from the middle button menu in the hits pane.

Effect All the records in the database that have been deleted but not expunged from the file are put into the hit list, and the data field currently selected in the fields pane is displayed in the hits pane for each of them.

Related topics deleting a record, displaying the list of records (the hit list)

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sort hits



Concept It is useful, especially for report creation, to be able to sort the list of records.

Procedure Select **sort hits** from the middle button menu in the hits pane.

Effect The hit list will be sorted alphabetically on the currently selected field in the fields pane and redisplayed in the hits pane.

Related topic displaying the list of records (the hit list)

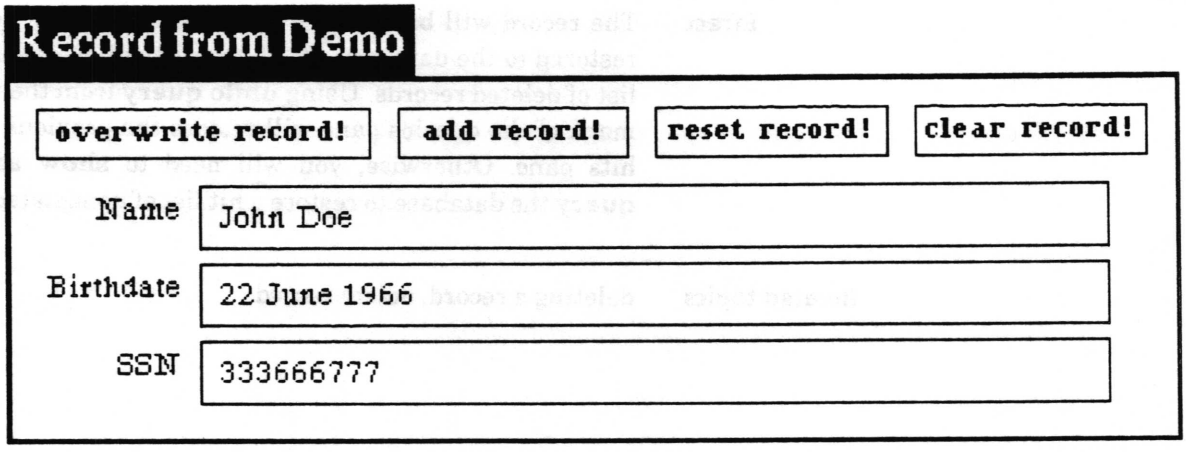
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spawn record



Concept This menu option allows a record to be displayed and edited in a separate window from the Database tool. This not only allows more than one record to be viewed at once, but provides an alternative and user tailorable display and editing format.

Procedure Use the left mouse button to select the desired record in the hits pane, then select **spawn record** from the middle button menu. When the origin cursor appears, frame the window.



Effect The contents of the record will appear in a Form tool window which has special features for use with database records. For details of using this window, see the "Database usage" subsection "form based record entry and editing".

Related topics form based record entry and editing, delete entry form

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undelete record



Concept Until they have actually been expunged from the database, deleted records can be viewed, and if desirable, restored to the database.

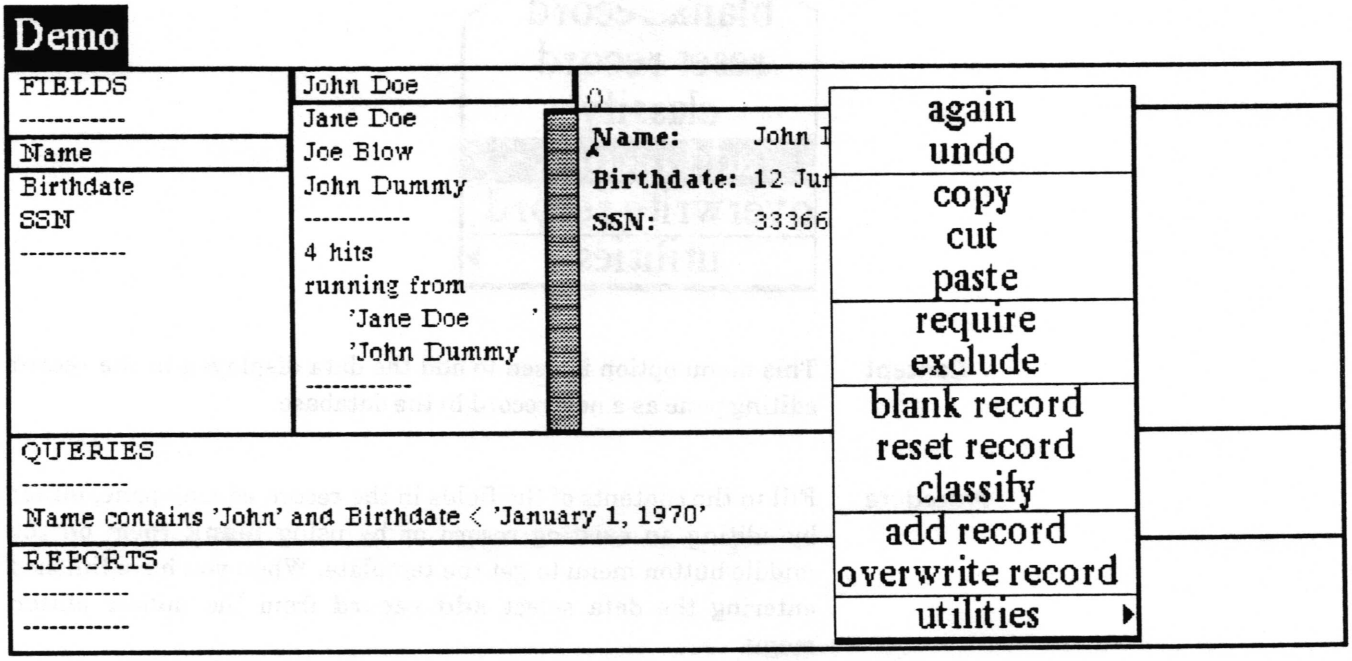
Procedure Display the list of deleted records by using the hits pane middle button menu option **show deleted records**. Use the left mouse button to select the deleted record to be restored and then select **undelete record** from the middle button menu.

Effect The record will be removed from the list of deleted records and restored to the database. The hits pane will continue to show the list of deleted records. Using **undo query** from the middle button menu of the queries pane will restore the previous hit list to the hits pane. Otherwise, you will need to **show all records** or **query** the database to restore a hit list of nondeleted records.

Related topics deleting a record, delete record

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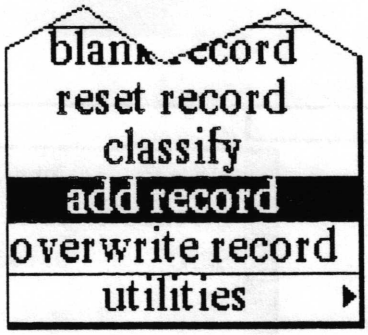
Record editing pane middle mouse button menu



Following in alphabetical order is a detailed description of each of the functions available in the middle button menu of the record editing pane. This section is intended to be reference material on how each menu choice works.

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add record



Concept This menu option is used to add the data displayed in the record editing pane as a new record in the database.

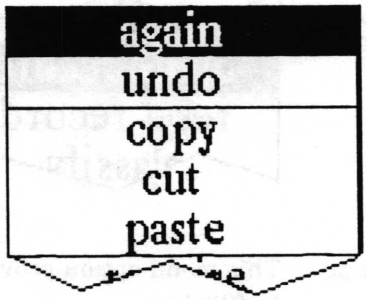
Procedure Fill in the contents of the fields in the record editing pane, either by editing an existing record or by using **blank form** on the middle button menu to get the template. When you have finished entering the data select **add record** from the middle button menu.

Effect If the Database tool does not find something obviously wrong with it, the new record will be added to the database and displayed on the end of the hit list in the hits pane. If it does find something wrong with it, such as a non–number in a number field, the record editing pane will flash and an error message will be inserted at the beginning of the troublesome field.

Related topics entering a new record, overwrite record

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again



Concept This menu option is used to repeat the last replacement action or to find the next occurrence of a piece of text in the pane.

Procedure To find the next occurrence of a piece of text, select the text to be found and **copy** or **cut** it (this may be in another window), select the location in the text where you want the search to begin, and then select **again** from the middle button menu. The text selection will either move to select the next occurrence of the text or the pane will flash to indicate that the text searched for was not found.

To use again to repeat a replacement action, the text being replaced must have just been replaced in one action by either pasting or typing the the new text over it. Select the location in the text where you want to start searching for the text to be replaced. Then select **again** from the middle button menu. Either the text to be replaced will be found, replaced, and the selection moved to the new text, or the pane will flash to indicate that no more occurrences of the text to be replaced were found.

If the left–shift key is held down while **again** is selected from the menu, the again action will be repeated until the end of the text in the pane is reached, or until you select **abort** from the middle mouse button menu.

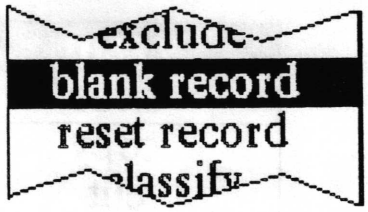
Effect A piece of text may be found or found and replaced.

Related topics copy, cut, paste

again Repeats the last copy or cut action.

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blank record



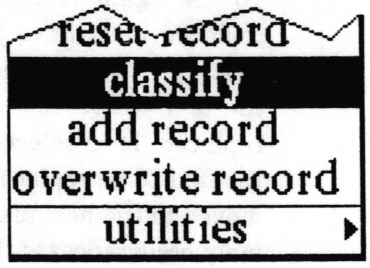
Concept This menu option provides a blank template of the data fields to be filled in.

Procedure Select **blank record** from the middle button menu of the record editing pane.

Effect An empty record will be displayed in the record editing pane.

Related topic entering a new record

classify



Concept Each record in the database may be individually classified through use of this menu option.

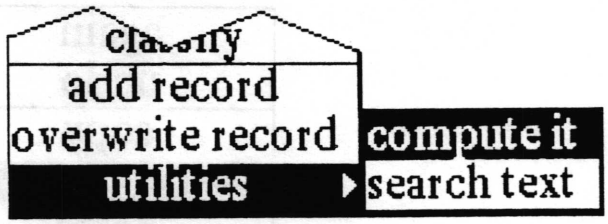
Procedure Display in the record editing pane the record to be classified. Select **classify** from the middle button menu of the record editing pane. A **Change Classification** QBox will appear for you to select the desired classification.

Effect After accepting the QBox, the record classification pane will show the new classification. If the contents of the record editing pane are either added as a record or used to overwrite the currently selected record, that classification will be used.

Related topics record classification pane, classification bars

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compute it

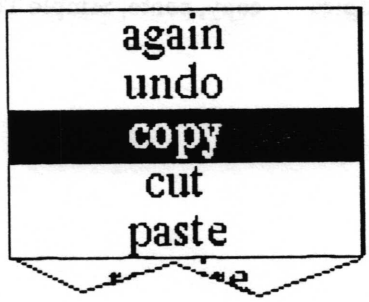


Concept This menu option is provided as a convenience for doing arithmetic computations.

Procedure Select the text containing an arithmetic statement and then select **utilities > compute it** from the middle button menu of the record editing pane.

Effect Either the result will inserted in the text following the statement and highlighted, or the statement will not be understood and an error will occur. For example, if you type in "2 + 3" and select it, then select **utilities > compute it**, the number "5" will appear.

copy



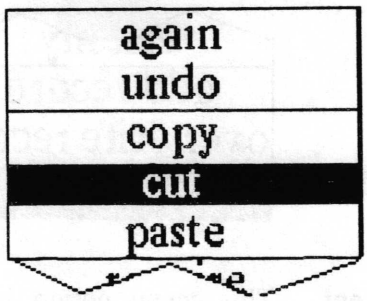
Concept This menu option is the standard Analyst text editing copy. Copied text is placed in the clipboard so that it can be pasted elsewhere.

Procedure Select the text to be copied and then select **copy** from the middle button menu of the record editing pane.

Effect A copy of the selected text is placed in the clipboard for later placement. Note: Although you may copy text from more than one field at a time, you will not be able to paste across fields in a database record editing pane.

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cut



Concept This menu option is the standard Analyst text editing cut. Cut text is removed from its current location and placed in the clipboard so that it can be pasted elsewhere.

Procedure Select the text to be deleted and then select **cut** from the middle button menu of the record editing pane. Note that you will not be allowed to cut any portion of the protected field name text.

Effect The selected text is deleted and placed in the clipboard for later placement, unless some part of a field name is selected (in which case the pane will flash).

Related topics copy, paste, Simple Text

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exclude



Concept This menu option provides a convenient means of querying the hit list for all records that do not have the same value as a particular field in the currently displayed record.

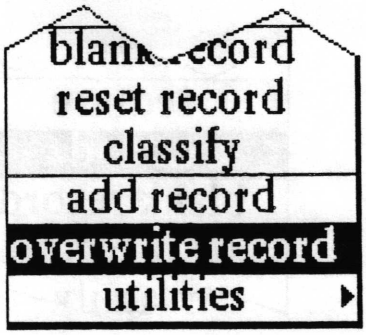
Procedure In the record editing pane, select anywhere in the data field to be tested against and then select **exclude** from the middle button menu.

Effect The records in the hit list will be queried to find those which have a different value for the field that was designated by the selection in the record editing pane. The new hit list will be displayed in the hits pane, and the record editing pane will be cleared (because the record that had been displayed would also have been excluded from the hit list).

Related topic querying the database

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overwrite record



Concept This menu option is used to overwrite the contents of the record currently selected in the hit pane with the data displayed in the record editing pane.

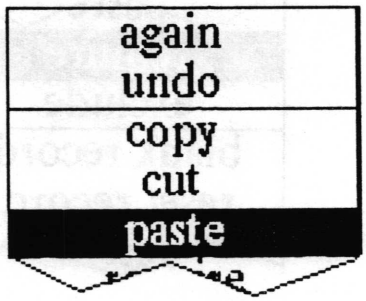
Procedure In the hits pane, select the record you want to modify and then edit it in the record editing pane. When you have finished editing, select **overwrite record** from the middle button menu.

Effect If the Database tool does not find something obviously wrong with it, the record will be overwritten and its display in the hits pane updated. If it does find something wrong with it, such as a non – number in a number field, the record editing pane will flash and an error message will be inserted at the beginning of the troublesome field. The original record will remain unchanged.

Related topics entering a new record, editing an existing record, add record

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paste



Concept This menu option is the standard Analyst text editing paste. The current text selection is replaced by any textual contents of the clipboard.

Procedure In the record editing pane, select the text to be replaced or the location to insert and then select **paste** from the middle button menu. Note that you will not be allowed to paste across fields or into the field names.

Effect The selected text is replaced with the contents of the clipboard, unless those contents are not textual (in which case a notifier will appear), or the current selection includes part of a field name (in which case the pane will flash).

Related topics copy, cut, Simple Text

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require



Concept This menu option provides a convenient means of querying the hit list for all records that have the same value as a particular field in the currently displayed record.

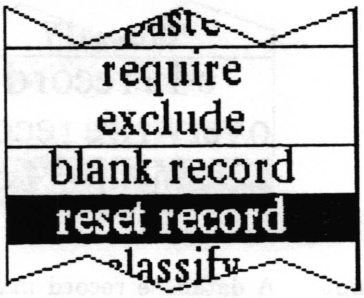
Procedure In the record editing pane, select anywhere in the data field to be tested against and then select **require** from the middle button menu.

Effect The records in the hit list will be queried to find those which have the same value for the field that was designated by the selection in the record editing pane. The new hit list will be displayed in the hits pane.

Related topic querying the database

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reset record



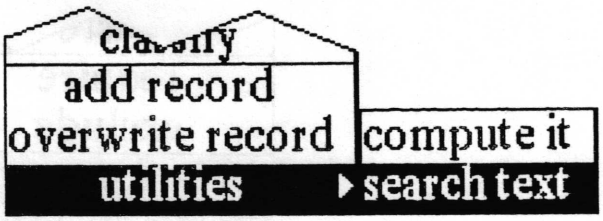
Concept This menu option cancels any changes made in the record editing or record classification panes.

Procedure In the record editing pane, select **reset record** from the middle button menu.

Effect The contents of the record editing and record classification panes will be set back to what they were before any editing was done. This will be either the contents of the selected record or a blank record.

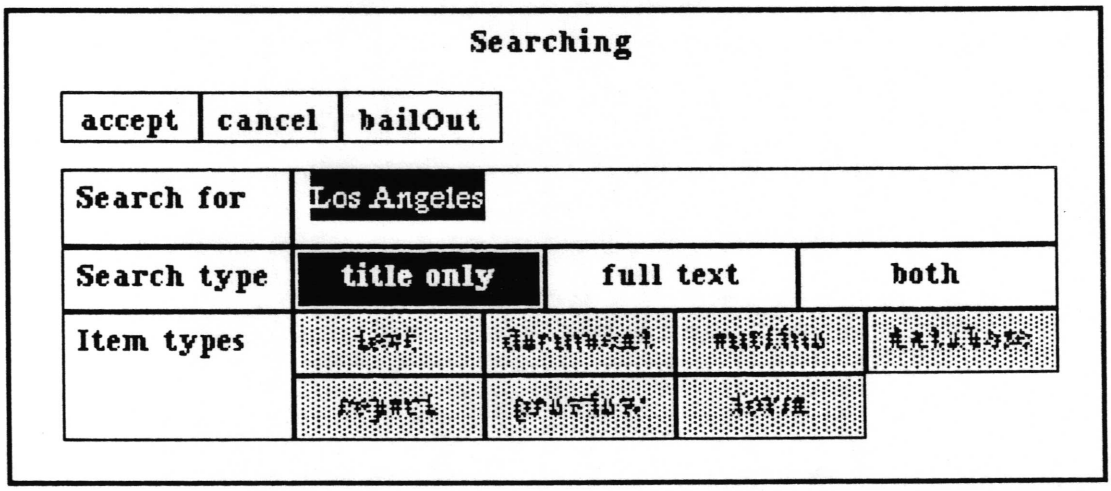
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search text



Concept A database record may contain information about or refer to a subject which the user would like to find references to in an Information Center. This menu option allows the user to search an Information Center for the presence of a word or term.

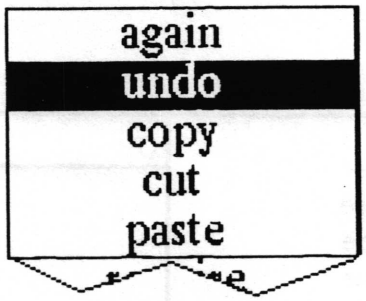
Procedure In the record editing pane, select the text to be searched for and then select **search text** from the middle button menu. An **Information Centers** QBox will appear for you to designate the name of the Information Center to be searched. After accepting that QBox, a **Searching** QBox will appear for you to fill out. The text you selected will be in the **Search for** field, you may change it if you like. Upper and lower case are important. If **Search type** is **title only**, then just the labels items in the center will be searched. If **Search type** is **full text**, then the entire textual contents of the data item types you select in the **Item types** field below will be searched. If **Search type** is **both**, then both types of search will be performed.



Effect After accepting the **Searching** QBox, the search will be performed. If any items are found they will be put into an Information Center holder and a corner cursor will appear for you to place it on the screen. If no references are found a notifier will appear and you will need to click a mouse button to get rid of it.

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undo



Concept This menu option is the standard Analyst text editing undo. It attempts to undo whatever the last command did.

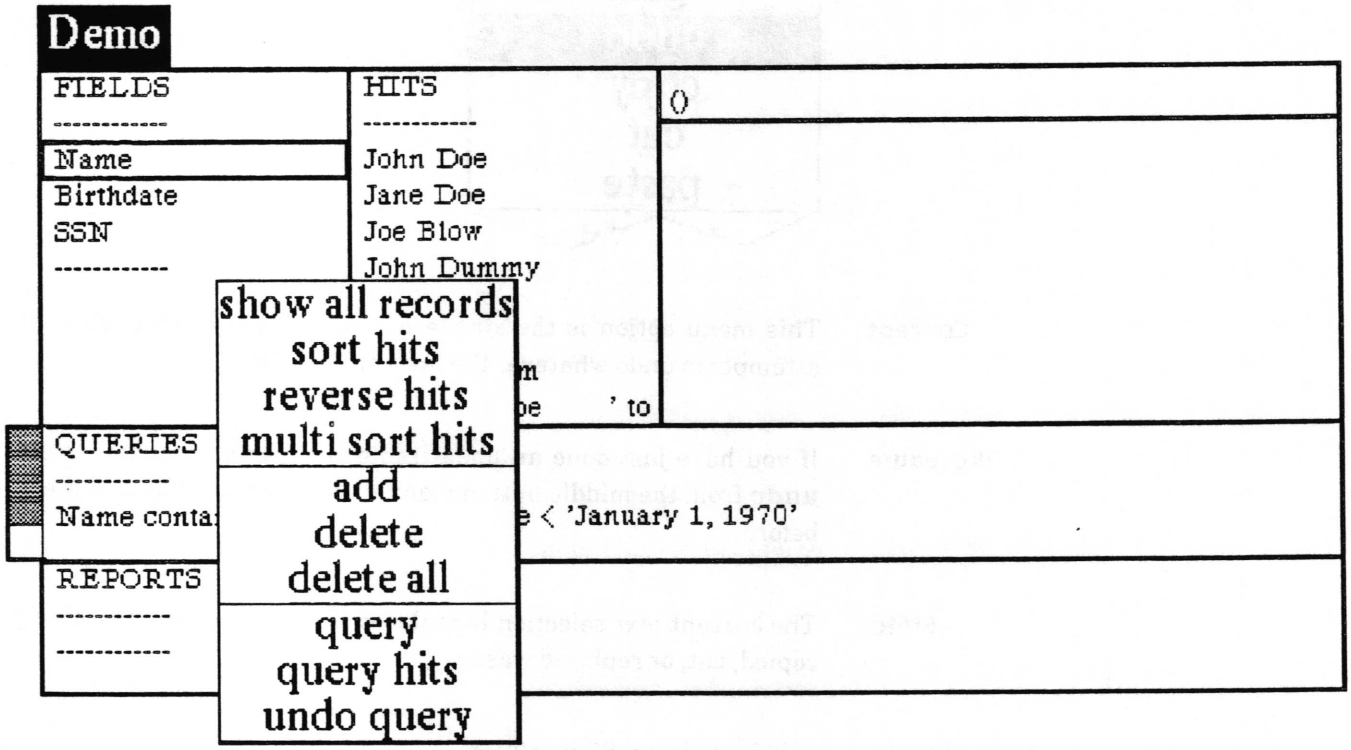
Procedure If you have just done an undesirable cut, paste, or undo, select **undo** from the middle button menu to get back to what was there before.

Effect The current text selection is replaced by whatever the last thing copied, cut, or replaced was.

Related topics copy, cut, paste, Simple Text

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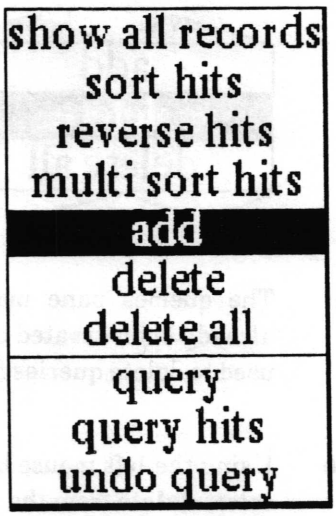
Queries pane middle mouse button menu



Following in alphabetical order is a detailed description of each of the functions available in the middle button menu of the queries pane. This section is intended to be reference material on how each menu choice works.

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add



Concept The queries pane may contain a list of queries which have already been created and are ready for use. This menu option is used to create and add a query to the list in the queries pane.

Procedure Select **add** from the middle button menu in the queries pane. A querier will appear to guide you through the creation of the query. It works by providing you a popup menu with only valid choices at each step in the process of creating the query. Two choices appear at the top of every menu – backspace and cancel. If at any point in the creation of your query you wish to forget the whole thing and get out of the querier, select cancel on the popup. If you want to go back and do the last step over again, select backspace on the popup. At the end of creating each expression, ACCEPT will appear on the popup. If you are finished creating the query, select ACCEPT.

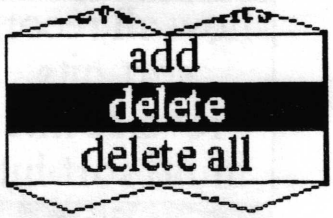
For details on the syntax of a query, see "syntax of a query" in the "querying the database" subsection of "Database usage". For a detailed example of creating a query, see "creating a query" in the same subsection.

Effect After ACCEPT is selected in the querier, the newly created query will appear in the list in the queries pane.

Related topics querying the database, query, query hits

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delete



Concept The queries pane may contain a list of queries which have already been created and are ready for use. This menu option is used to delete queries from the list.

Procedure Using the left mouse button, select the query to be deleted. Then select **delete** from the middle button menu.

Effect The selected query will be deleted from the list of queries in the queries pane.

Related topics querying the database, add, delete all

delete all



Concept The queries pane may contain a list of queries which have already been created and are ready for use. This menu option is used to delete all the queries from the list at once.

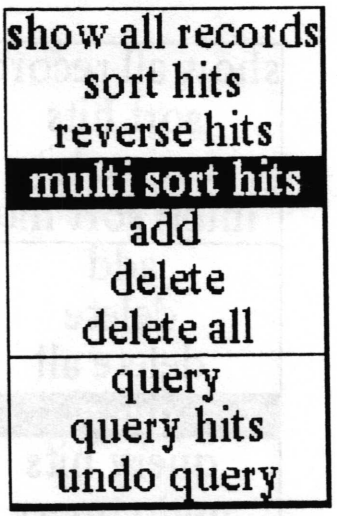
Procedure Select **delete all** from the middle button menu.

Effect All the queries will be deleted from the queries pane.

Related topics querying the database, add, delete

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multi sort hits



Concept It is useful, especially for report creation, to be able to sort the list of records. This option provides for sorting against multiple fields.

Procedure Select **multi sort hits** from the middle button menu. A querier will appear. In the middle mouse button menu of the querier is a list of all the field names. Select the name of the first field to sort the contents of. The middle mouse button menu will now contain a choice of **ascending** or **descending**. Select **ascending** to sort the contents of that field alphabetically with a < b. Select **descending** to obtain the reverse order. You can now select from the middle mouse button menu either another field to sort against or you can select **accept** to start the sorting. If you do select a second field name, it will be used to sort the records in which the first field selected are equal. A third field would sort those records in which the first two fields were equal, and so on.

Effect The hit list will be sorted according to the specified list of fields and redisplayed in the hits pane. In the example below, the records shown are sorted by age ascending, weight descending, name ascending.

name	age	weight
Jack	20	220
Joe	20	220
Jerry	20	215
Jeff	23	221
John	23	210

Related topic displaying the list of records (the hit list)

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query



Concept A query is used to filter records according to the data in their fields. This menu option is used to query all the records in the database.

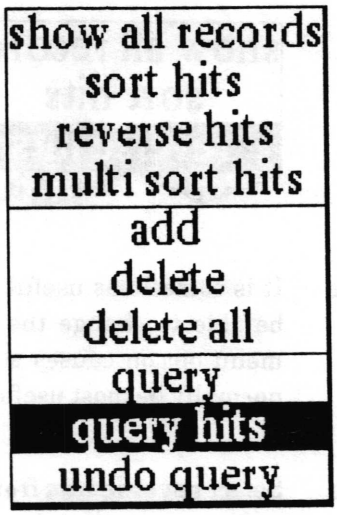
Procedure If the query you wish to use already exists in the list of queries, use the left mouse button to select it. (If it is anything but a simple query, you probably should **add** it to the list). Select **query** from the middle button menu. If you did not select an existing query, you will now be presented with a querier to create the query to be used.

Effect The query will be run against all the nondeleted records in the database. When it has finished, the results will become the hit list and be displayed in the hits pane. If you decide the query was a mistake, you may return to the previous hit list by selecting **undo query** in the middle button menu.

Related topics querying the database, add, query hits, undo query

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query hits



Concept A query is used to filter records according to the data in their fields. This menu option is used to query just the records in the hit list. This allows querying the database in stages or by a series of simple queries.

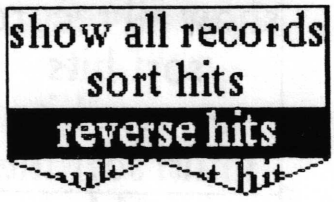
Procedure If the query you wish to use already exists in the list of queries, use the left mouse button to select it. (If it is anything but a simple query, you probably should **add** it to the list). Select **query hits** from the middle button menu. If you did not select an existing query, you will now be presented with a querier to create the query to be used.

Effect The query will be run against the records in the hit list. When it has finished, the results will become the hit list and be displayed in the hits pane. If you decide the query was a mistake, you may return to the previous hit list by selecting **undo query** in the middle button menu.

Related topics querying the database, add, query, undo query

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reverse hits



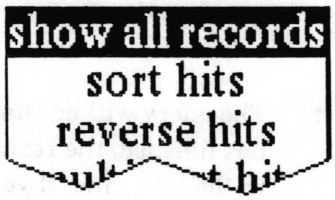
Concept It is sometimes useful, particularly in the creation of reports, to be able to change the order of the records in the hit list. This menu option causes a simple reversal of the order – it would normally be most useful after sorting the hits.

Procedure Select **reverse hits** from the middle button menu.

Effect The order of records in the hit list is reversed and displayed in the hits pane. Reversal means that the first item on the list becomes the last item on the list, the second item on the list becomes the second to last item on the list, and so on.

Related topics displaying the list of records (the hit list), sort hits

show all records



Concept This menu option shows all the undeleted records in the hits pane.

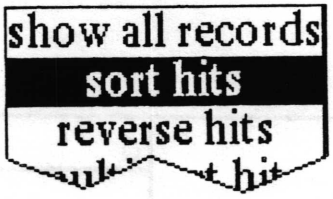
Procedure Select **show all records** from the middle button menu.

Effect All the records in the database that are not deleted are put into the hit list and the data field currently selected in the fields pane is displayed in the hits pane for each of them.

Related topic displaying the list of records (the hit list)

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sort hits



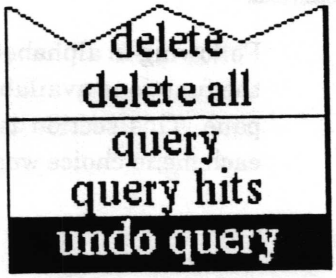
Concept It is useful, especially for report creation, to be able to sort the list of records.

Procedure Select **sort hits** from the middle button menu.

Effect The hit list will be sorted alphabetically on the currently selected field in the fields pane and redisplayed in the hits pane.

Related topic displaying the list of records (the hit list)

undo query



Concept This menu option lets you restore the hit list to what it was before the last command that changed it.

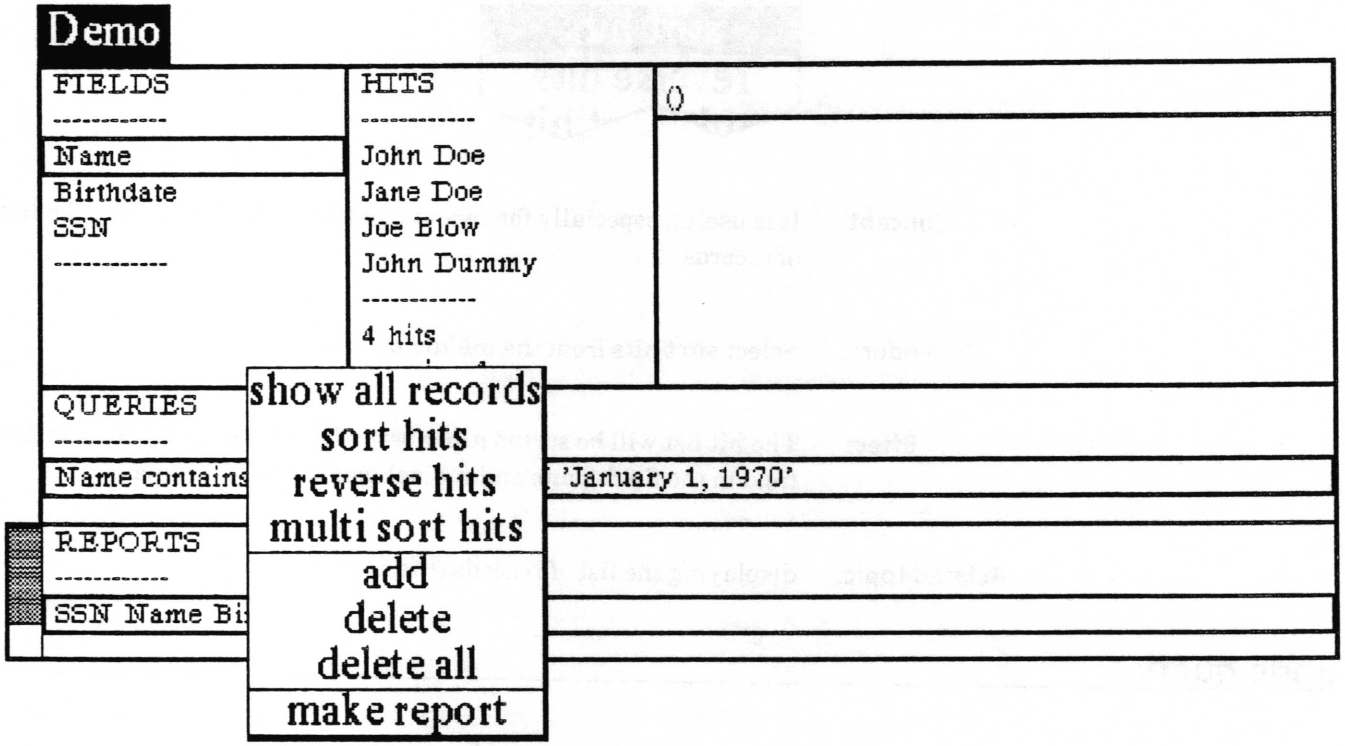
Procedure Select **undo query** from the middle button menu.

Effect The hit list will be changed back to what it was before and redisplayed in the hits pane. If you select **undo query** again, the list will be toggled back to what was just undone, allowing you to toggle back and forth between lists.

Related topic displaying the list of records (the hit list), query, query hits

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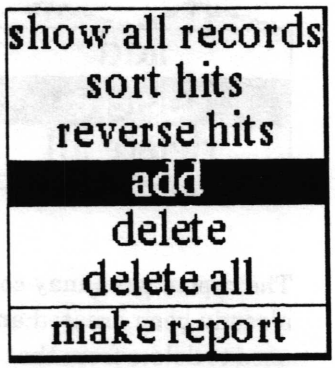
Reports pane middle mouse button menu



Following in alphabetical order is a detailed description of each of the functions available in the middle button menu of the reports pane. This section is intended to be reference material on how each menu choice works.

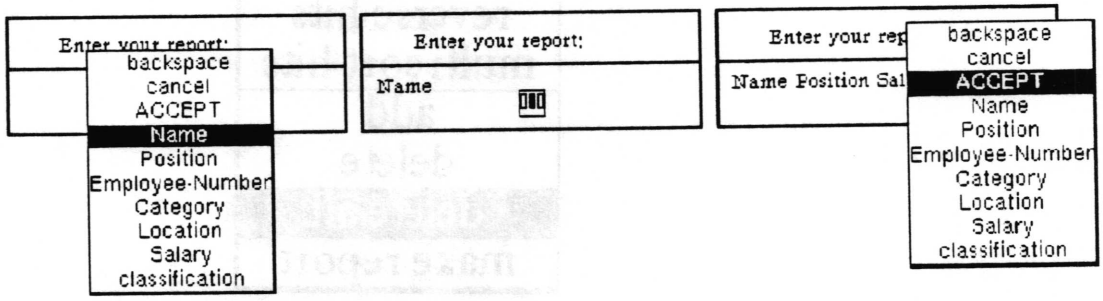
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add



Concept The reports pane may contain a list of report formats which have already been created and are ready for use. This menu option lets you add to that list.

Procedure Select **add** from the middle button menu. A querier will appear. Press down the middle mouse button to obtain a popup menu containing the field names in the database. Select the field you want to provide the data for the first column in the report. It will appear in the querier. Press the middle button again and select the field to appear in the next column. If you make a mistake, you can go back one selection by using backspace from the menu, and forget the whole thing with cancel. You may repeat a field if you wish. When you have entered all the columns, select ACCEPT from the popup.



Effect After selecting ACCEPT in the querier, the list of fields will appear as a line in the reports pane.

Related topic generating a report from the database

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delete



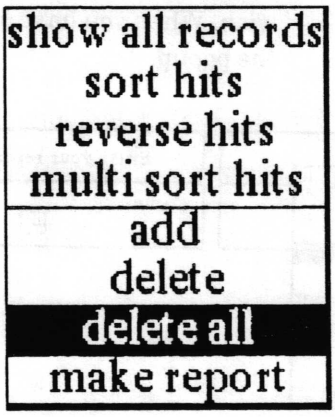
Concept The report pane may contain a list of report formats which have already been created and are ready for use. This menu option is used to delete from that list.

Procedure Using the left mouse button, select the report format to be deleted. Then select **delete** from the middle button menu.

Effect The selected report format will be deleted from the list in the reports pane.

Related topics add, delete all

delete all



Concept The report pane may contain a list of report formats which have already been created and are ready for use. This menu option is used to delete everything from that list.

Procedure Select **delete all** from the middle button menu.

Effect The list in the reports pane will be emptied.

Related topics add, delete

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make report



Concept This menu option is used to generate a columnar report from the records in the hit list. The user specifies which data field to use and the maximum width for each column. The data is then collected and composed, with line breaks and tabs placed as necessary to get the data of each field properly in its column. A document window is opened on the result.

Procedure If you want to use a report format from the list in the reports pane, select it. Select **make report** from the middle button menu. It will then ask you for the orientation of the report – portrait or landscape. This is just used to determine which orientation of document to make. Next, a **Maximum Classification Level** QBox appears. It will display the classification of the database. By selecting a lower classification you may exclude any records with a higher classification from the report. Accept the QBox.

If you did not select an existing report format to make a report from, a querier for entering the fields to be output will now appear. See the menu item **add** for details on its use.

Next, an **Enter Column Widths in Inches** QBox appears which enables you to set the width in inches for each field's column. When finished setting the desired width(s), accept the QBox.

Effect After it thinks for awhile (depending on how big and/or complex the report is), it will prompt you to frame the document window containing the results. Each record will be in a separate paragraph. The tab stops have been located at exactly the widths you gave as the maximum column widths, but you may find it desirable to move them a bit farther apart and/or change the tab stop alignment. The text will all be in the default system font. You may change the font, but be aware that you may have to adjust the tab stops and move line breaks around to make it look good afterwards. For details on using the Document window, see the *Document* chapter of the Analyst User Guide.

Related topics generating a report from the database, Document System

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multi sort hits



Concept It is useful, especially for report creation, to be able to sort the list of records. This option provides for sorting against multiple fields.

Procedure Select **multi sort hits** from the middle button menu. A querier will appear. In the middle mouse button menu of the querier is a list of all the field names. Select the name of the first field to sort the contents of. The middle mouse button menu will now contain a choice of **ascending** or **descending**. Select **ascending** to sort the contents of that field alphabetically with a < b. Select **descending** to obtain the reverse order. You can now select from the middle mouse button menu either another field to sort against or you can select **accept** to start the sorting. If you do select a second field name, it will be used to sort the records in which the first field selected are equal. A third field would sort those records in which the first two fields were equal, and so on.

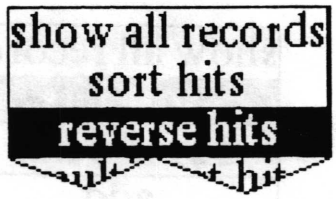
Effect The hit list will be sorted according to the specified list of fields and redisplayed in the hits pane. In the example below, the records shown are sorted by age ascending, weight descending, name ascending.

name	age	weight
Jack	20	220
Joe	20	220
Jerry	20	215
Jeff	23	221
John	23	210

Related topic displaying the list of records (the hit list)

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reverse hits



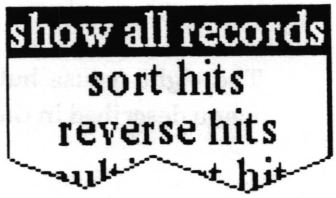
Concept It is sometimes useful, particularly in the creation of reports, to be able to change the order of the records in the hit list. This menu option causes a simple reversal of the order – it would normally be most useful after sorting the hits.

Procedure Select **reverse hits** from the middle button menu.

Effect The order of records in the hit list is reversed and displayed in the hits pane. Reversal means that the first item on the list becomes the last item on the list, the second item on the list becomes the second to last item on the list, and so on.

Related topics displaying the list of records (the hit list), sort hits

show all records



Concept This menu option shows all the undeleted records in the hits pane.

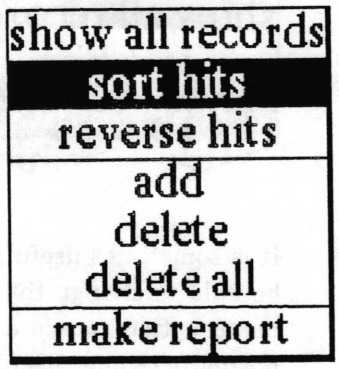
Procedure Select **show all records** from the middle button menu.

Effect All the records in the database that are not deleted are put into the hit list and the data field currently selected in the fields pane is displayed in the hits pane for each of them.

Related topic displaying the list of records (the hit list)

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sort hits



Concept It is useful, especially for report creation, to be able to sort the list of records.

Procedure Select **sort hits** from the middle button menu.

Effect The hit list will be sorted alphabetically on the currently selected field in the fields pane and redisplayed in the hits pane.

Related topic displaying the list of records (the hit list)

Right mouse button menu

The right mouse button brings up the standard window popup menu described in the *System Interface* chapter of this document.

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Glossary

date

A day, month, and year. It may be entered in several formats, but currently it is always displayed in the format *23 December 1987*. If no date is entered in a date field, the Database will display it as *unknown date*. Some of the forms a date may be entered in are:

day monthName year	eg. 5 April 1982; 5 – APR – 82
monthName day year	eg. April 5, 1982; apr 5 82
monthNumber day year	eg. 4/5/82; 4 – 5 – 82

field

A portion of a database record which has a name, length, and data type.

hit

A database record meeting some requirement.

hit list

A list of hits. An ordered set of records in the database which meet some common requirement. The requirement may be as simple as being a nondeleted record in the database (hit list generated by **show all records**), or a complex combination of field values (hit list generated by queries).

landscape

An orientation in which the longer dimension is horizontal. For example, the landscape orientation of an 8 1/2" by 11" piece of paper is with the 11" sides horizontal.

number

A combination of the numerals 0 through 9, up to one decimal point, and a negative sign (hyphen) in front if desired. Some examples of numbers are:
13; 145.8769; 89.0; 0.445; – 0.76; – 54

portrait

An orientation in which the longer dimension is vertical. For example, the portrait orientation of an 8 1/2" by 11" piece of paper is with the 11" sides vertical.

querier

A user input device that looks like a prompter but instead of the user typing into it, inputs must be selected from middle mouse button popup menus. The choices on the menus are defined in such a way that the user is forced to make syntactically correct inputs.

query

n. A logical expression used to filter records according to the data in their fields.
v. To run a query on (filter) a set of records.

record

A database entry. The basic unit of information in a database. A record consists of one or more data fields.

string

Any sequence of characters.

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time

An hour, minute, second, and *am* or *pm*. It may be entered in 24 hour format, but will always be displayed as *hh:mm:ss am* or *hh:mm:ss pm*. If no time is entered in a time field, the Database will display it as *unknown time*. The form for entering a time is:

<hour>:<minute>:<second> <am/pm>

where: <minute>, <second> or <am/pm> may be omitted.

e.g. 1:59:30 pm; 8AM; 15:30

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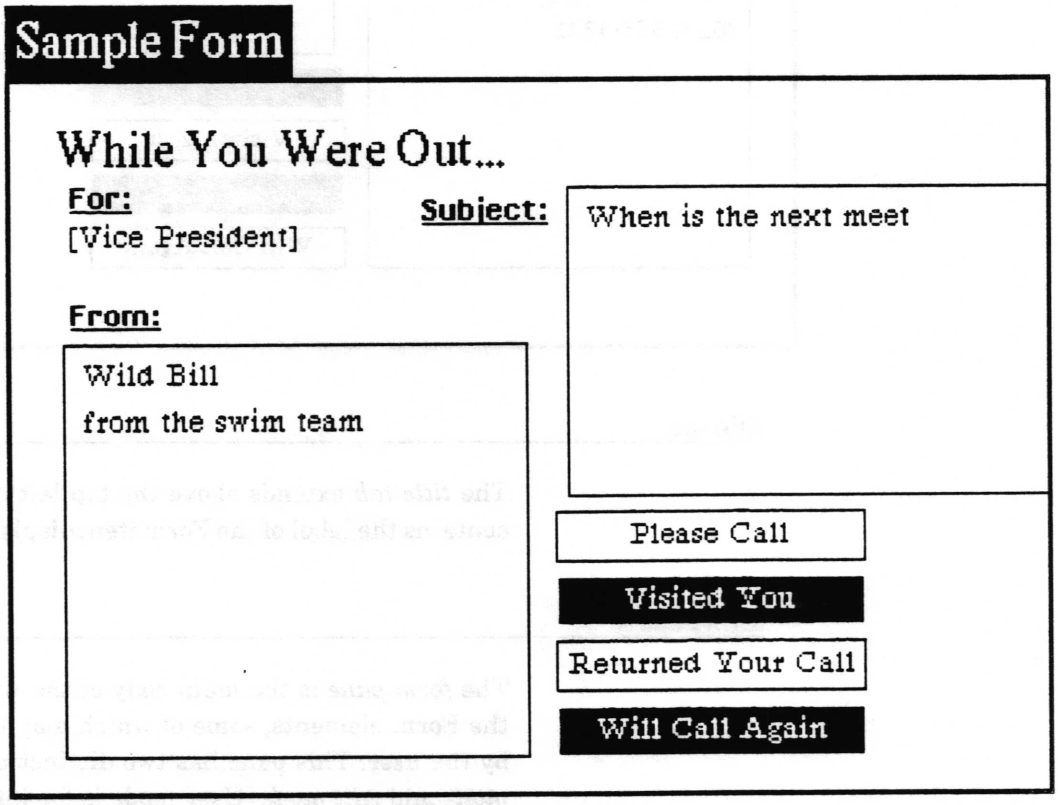
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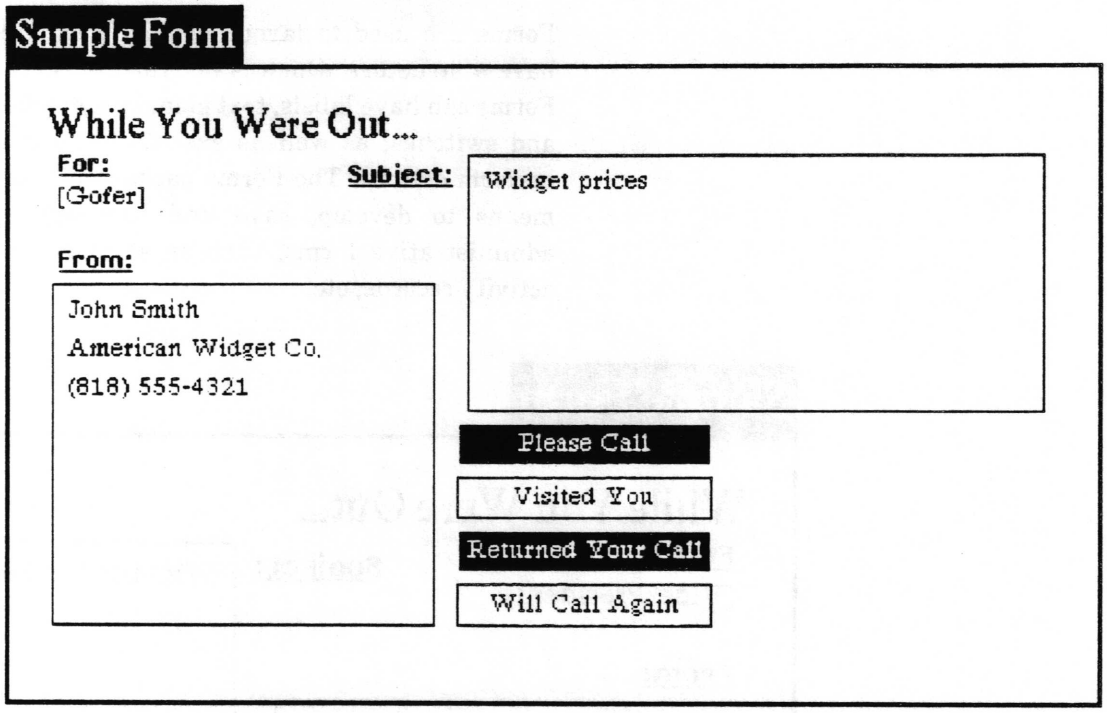
Forms

Forms are used to layout heavily formatted documents which have a structure which is not readily represented as pure text. Forms can have labels, text elements, graphical elements, menus and switches, as well as execute buttons and code which can perform actions. The Forms package provides the user with the means to develop, save and hardcopy specific business or administrative forms, such as sales orders, or request forms, activity records, etc.



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Form window layout



title tab

The *title tab* extends above the top left corner of the window. It contains the label of the Form item displayed in the window.

form pane

The *form pane* is the main body of the window. It contains all of the Form elements, some of which may be filled in interactively by the user. This pane has two distinct modes of operation: *user mode* and *edit mode*. User mode is for interactively filling in the contents of the elements. Edit mode is for defining new elements and modifying parameters of existing elements. When in user mode, the Form Editor is inactive. When in edit mode, the Form Editor is active. Existing Forms open in user mode, new Forms open in edit mode.

classification bars

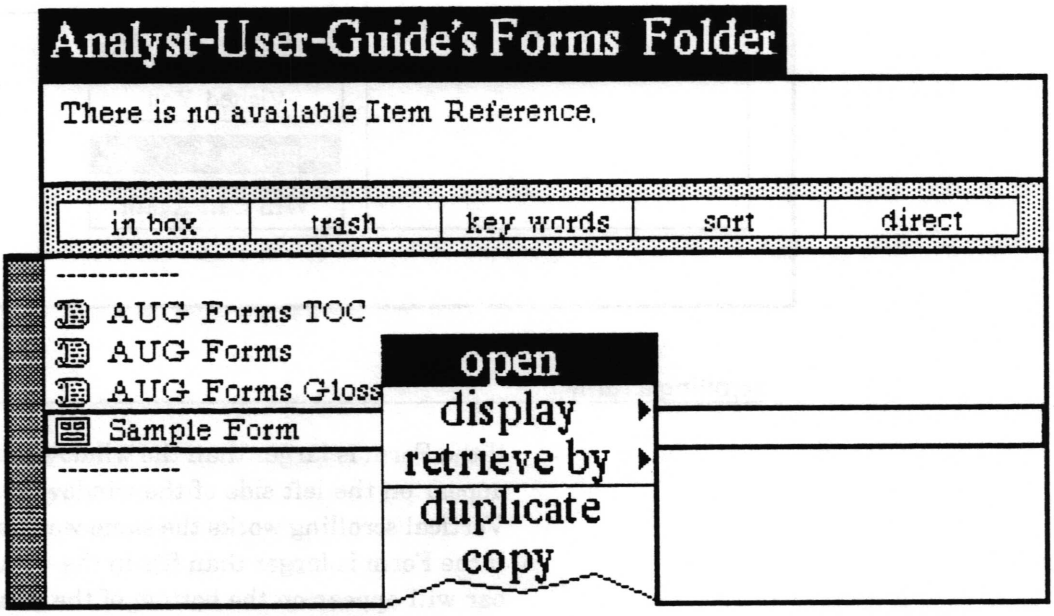
The classification bars are rectangular areas on the top and bottom of the window when the Form is classified. They display the classification. When the Form window is active, these area are displayed in reverse video (white text on black background).

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Form usage

opening an existing form

To open an existing Form, select the Form item in an Information Center folder and then select **open** from the middle button menu. When you frame the window, it will try to present you with a reasonable default size. If you wish, you may pull the frame to either a smaller or larger size. If the entire Form does not fit in the window, a horizontal and/or vertical scroll bar will be attached to the window. Existing Forms will always open in user mode.



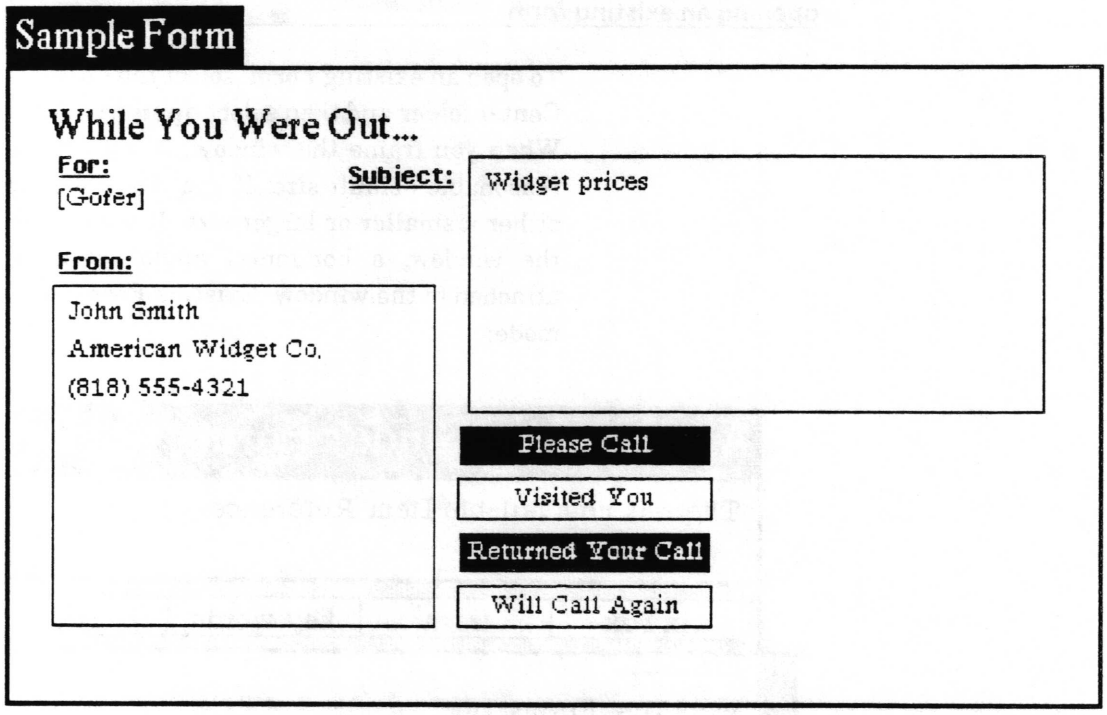
filling in a form

A Form may be filled in when in user mode (when the Form Editor is inactive). Filling in a Form consists of interactively specifying the values of elements by typing (fill in elements), choosing from a menu of options (choice elements), selecting/deselecting (switch elements), selecting an action (execute elements), or by pasting an image (image elements).

In general, pressing the left mouse button while the cursor is over an element will initiate an action – place the caret for typein, bring up a menu, change the state, or execute a function. The tab key will cause the contents of the next fill in element to be selected. If no element is selected, pressing the tab key will cause the contents of the first fill in element to be selected. Holding down the left shift key while striking the tab will cause the contents of the previous field to be selected.

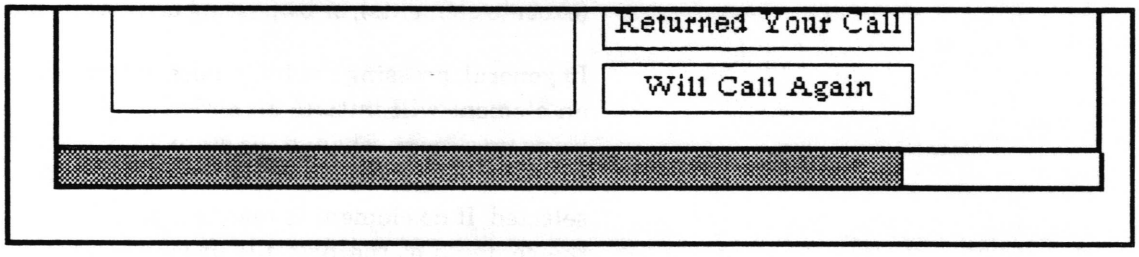
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In the example below, "Gofer" was selected from a menu of choices, "Widget prices" and "John Smith..." were typed, and the "Please Call" and "Returned Your Call" switches were selected.



scrolling a form

If the Form is larger than the window vertically, a scroll bar will appear on the left side of the window to allow vertical scrolling. Vertical scrolling works the same way as it does in text windows. If the Form is larger than fits in the window horizontally a scroll bar will appear on the bottom of the window so you can scroll it horizontally. Horizontal scrolling is accomplished in a fashion similar to that used for vertical scrolling. The illustration below shows a horizontal scroll bar. Pressing the left button within the bar will move the Form left in the window. The right button will move the Form to the right. As in vertical scrolling, the middle button will drag the gray area (which represents the part of the Form currently visible).



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hardcopying the form

A Form can be hardcopied when in user mode by selecting **hardcopy** from the middle button menu while holding down the left shift key. Refer to the "Hardcopy Tool" section of the *System Interface* chapter of this document for further information.

saving a filled in form

A Form can be saved when in user mode by selecting **save form** from the middle button menu while holding down the left shift key. A Form can also be saved when in edit mode (when the Form Editor is active) by selecting **save form** from the middle button menu. The current state of the Form will be written to its file on the disk.

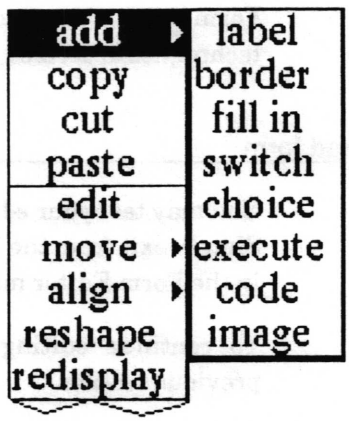
creating a new form

A new Form may be created from any Information Center folder by using the folder middle mouse button menu **create> form** entry. The standard Information Center **create** QBox will be displayed. Select **accept** after filling in the appropriate information.

The new Form item will be added to the Information Center folder and the outline of a new Form window about the size of a page will be displayed. Move the outline as you wish and place it by clicking the left mouse button.

laying out and editing a new form

When a new Form is created, the Form Editor is active. Form elements are then created and placed using the (Editor) middle mouse button **add>** entry. The current choices are: **label, border, fill in, switch, choice, execute, code,** and **image** elements. The specifics of each will be discussed in the following sections.



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After selecting an element type, an origin cursor will be displayed. The rectangular shape and position of the element within the Form may then be defined. Move the cursor to the upper left corner of the desired area, press the left mouse button and draw out the rectangle, then release the button.

Once the shape and position of an element have been specified, a QBox will be displayed to allow specification of parameters for the element; i.e., whether the border is to be displayed, the alignment of any displayed text, etc.

Gridding is provided to simplify the task of aligning elements. When editing, position and size are restricted to multiples of 5 screen pixels.

Other middle mouse menu items are available to manipulate existing elements. In order to use most of these functions, you must first select an element by moving the cursor over the element and clicking the left mouse button.

At any point in the editing process you may save your current work using the **save** middle mouse button menu item.

editing an existing form

To edit a Form which has previously been saved, first select and open the Form from within the containing Information Center folder. The Form will be opened with the Form Editor inactive. Move the cursor within the area of the Form, hold down the left shift key and bring up the middle mouse menu.



Release over the **edit form** menu item. This will activate the Form Editor. You may now proceed to modify the Form using the techniques described in the previous section.

testing an edited form

You may test your edited Form at any step in the editing process. Simply exit from the Form Editor by selecting the **end edit** entry in the Form Editor middle mouse button menu.

To continue editing the Form, proceed as described in the previous section.

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writing code for code elements

In user mode, a code element may be selected with the left mouse button to cause execution of its code. Almost any piece of Smalltalk code can be used in a code element. An especially useful feature is that the code may access other elements in the form to use or change their value.

referencing other elements

Each element has a name which can be used to refer to it by the code in a code element. For example, to get the element named 'fillInField1', the code to access that element would look like:

```
fillInField1
```

A number of messages can be sent to the element to get useful results. The message 'value' will get the element to return its value.

Some other messages that can be sent to every type of element are:

value:	set the element's value (see below for more information)
enabled	return a true if element is enabled, false if not
enabled:	set whether element is enabled with true or false
bordered	return a true if element is bordered, false if not
bordered:	set whether element is bordered with true or false
hasChanged	return true if the element has changed since last saved
hasChanged:	set whether element has changed since last save
display	causes the element to redisplay itself

element type values

fill in Most elements of forms are fill in elements, which allow the user to type in values as needed. Fill in fields store their value as a Text object, an object which has a character string and some formatting information. In general, this is an inconvenient form to work with, but it can easily be converted to a String object, and from that into a variety of other types.

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Text objects can be converted to strings by sending them the message *string*. So, for example, to get the value of an element named 'fillInField1' and convert it to a String, the following piece of code would be used:

```
fillInField1 value string.
```

The value can be treated as a number, by sending the string version of the value the message *asNumber*, which will convert it into a Number. For example:

```
fillInField1 value string asNumber
```

The value can be treated as a date, by sending the string version of the value the message *asDate*, which will convert it into a Date. For example:

```
fillInField1 value string asDate
```

The value can be treated as a time, by sending the string version of the value the message *asTime*, which will convert it into a Time. For example:

```
fillInField1 value string asTime
```

Once it has been converted to a Number, Date, or Time, many operations can be performed on the value. Use the Smalltalk browser or see the *Spreadsheet* documentation for operations that can be performed on numbers, dates, or time.

switch Switches store their value as a Boolean object, an object which is either true or false. The value is true if the element is highlighted, and false if the element is not highlighted. The value can be obtained by sending the message 'value' to the form element. So, for example, to get the value of an element named 'element1', the following piece of code would be used:

```
element1 value
```

The boolean value returned can be used in some other fashion. Use the Smalltalk browser or see the *Spreadsheet* documentation on booleans and conditionals for details of how you can use these. The following example adds 1 to the value of a variable 'a' when the element named 'element1' has been highlighted:

```
element1 value ifTrue: [a ← a + 1].
```

choice Choice elements store their value as a String object. These can be used just as if one had a String obtained from a fill in value.

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changing the value of elements

The value of an element can be changed by sending it the message 'value:' with the new value as the argument. In the following example, a fill in element named 'fillInField1' is given a new value. The 'asText' message has been sent to the string in order to convert it into a text, which fill in elements require as a value.

```
fillInField1 value: 'The new value' asText.
```

However, the element has not been told to redisplay itself after its value has been changed. This can be useful if you don't wish anyone to see interim values being stored in the element until a calculation is complete. To make a an element redisplay, send it the 'display' message. Adding to the example above:

```
fillInField1 value: 'The new value' asText.
fillInField1 display.
```

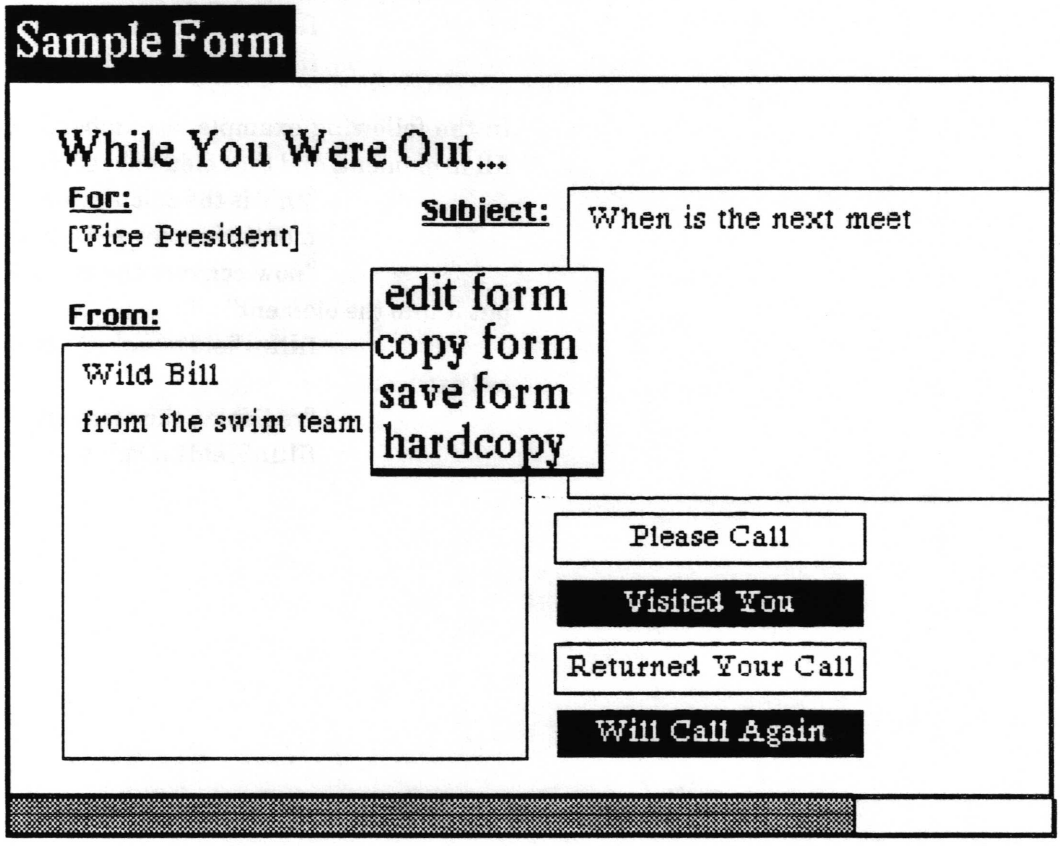
In the following example, a number is calculated, placed into a fill in element, and that element redisplayed with its new value.

```
"this is the calculation"
monthNumber ← Date today monthIndex.
"now convert the calculated value to a Text and
put it into the element"
fillInField1 value: monthNumber printString
asText.
"redisplay the element"
fillInField1 display.
```

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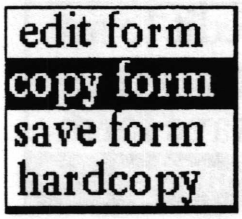
User middle mouse button menu

There are actually several menus which can appear when the middle mouse button is pressed within a Form. Each individual element may have its own middle button menu. Choice elements, for instance, have a middle button menu consisting of all choices for that element. Fill in elements have a text editing menu. In addition to these element menus, there is a special middle button menu for the overall Form. This can be obtained at any time by pressing the left shift key while pressing the middle mouse button. Each of the choices on this main menu is examined in detail below.



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copy form

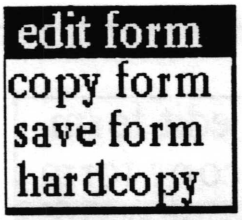


Concept Puts the Form with all of its formatting information into the clipboard. From there, it can be pasted into a variety of windows.

Procedure Holding down the left shift key, press the middle mouse button and select **copy form** from the resulting menu.

Effect The entire Form is placed in the clipboard.

edit form



Concept Places the Form in edit mode. The middle button menu now changes to the editing menu, instead of the user menu.

Procedure Holding down the left shift key, press the middle mouse button and select **edit form** from the resulting menu.

Effect The Form may now be altered.

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hardcopy



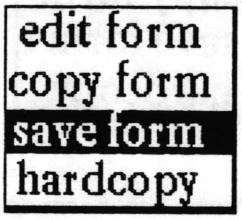
Concept Makes a printer output representation of the Form.

Procedure Holding down the left shift key, press the middle mouse button and select **hardcopy** from the resulting menu. The standard **Hardcopy** QBox will appear.

Effect The Form will be hardcopied.

Related topics Hardcopy Tool

save form



Concept Causes the Form to be saved to its file on the disk.

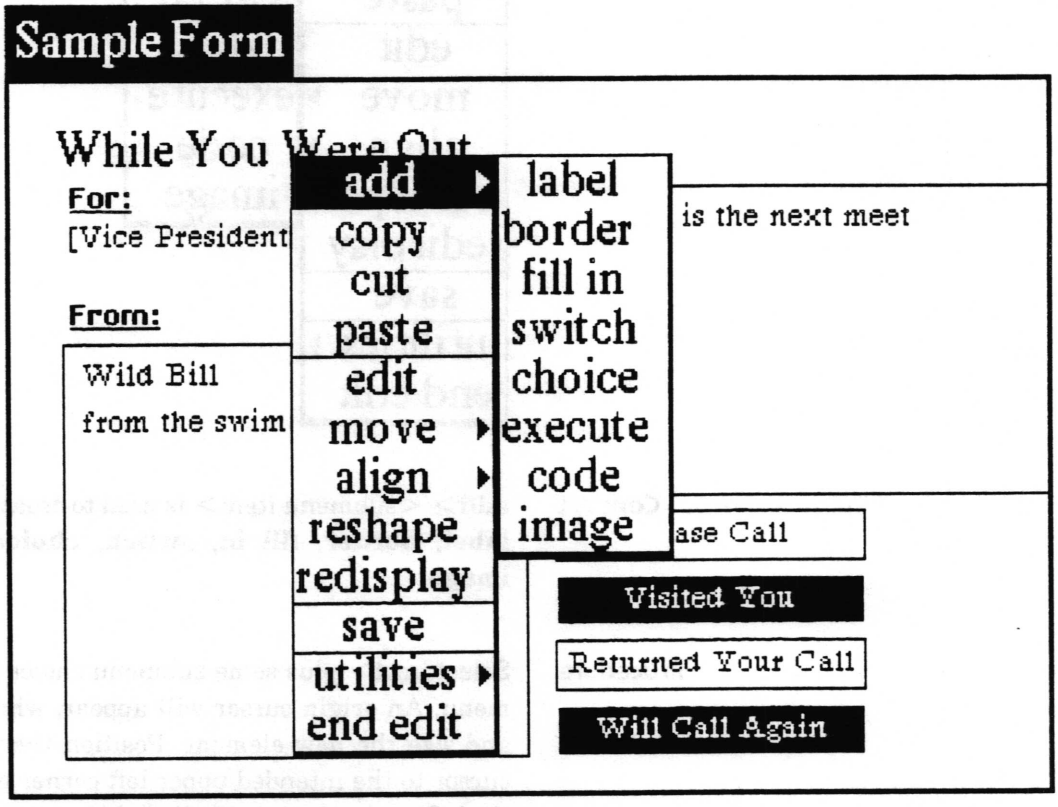
Procedure Holding down the left shift key, press the middle mouse button and select **save form** from the resulting menu.

Effect The Form and all associated details will be written to its disk file.

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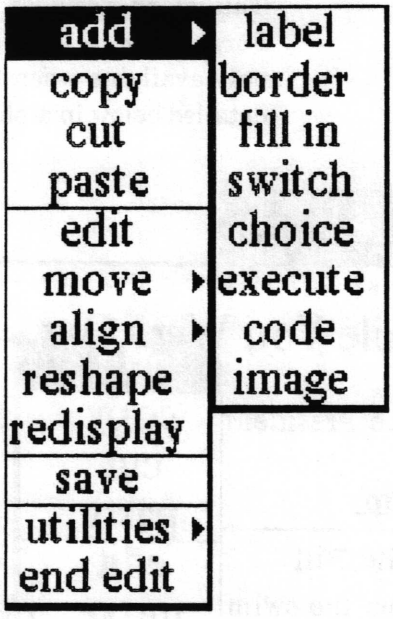
Form Editor middle mouse button menu

This menu provides operations to create, modify and remove Form elements. The Form Editor middle mouse button menu is only available when the Form Editor is active. The options are detailed below in alphabetical order.



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add



Concept **add>** <submenu item> is used to create Form elements of type **label**, **border**, **fill in**, **switch**, **choice**, **execute**, **code**, and **image**.

Procedure Select **add>** plus some submenu choice from the middle button menu. An origin cursor will appear, which can be used to place and size the new element. Position the element by moving the cursor to the intended upper left corner of the element and press the left mouse button. While holding down the button, draw down and to the right. When the outline is the desired size, release the button.

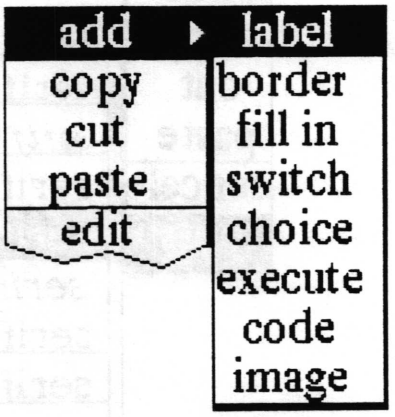
A QBox will then be displayed. When the necessary information has been supplied, select **accept**. See the following specific **add>** menu choice section for details.

Effect A new element of the specified choice, size and location will be added to the Form.

Related topics QBox and **label**, **border**, **fill in**, **switch**, **choice**, **execute**, **code**, and **image** menu items.

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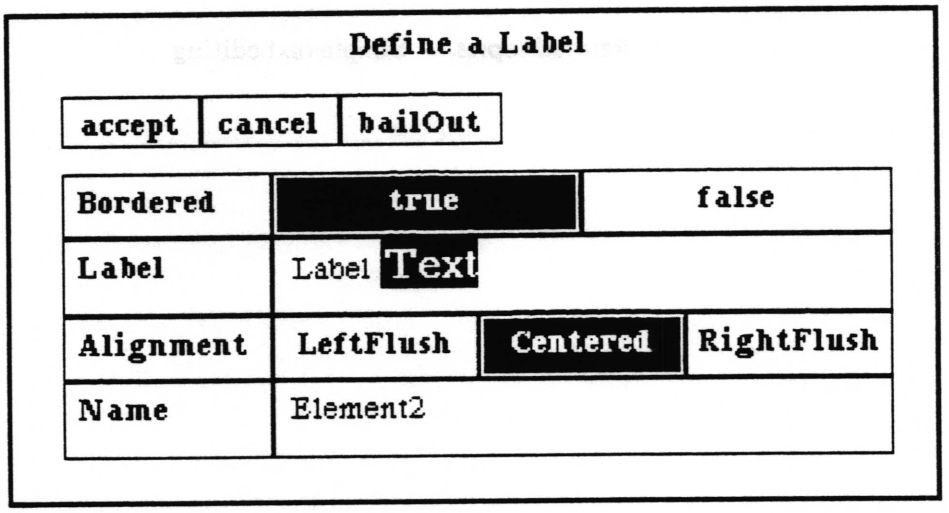
label (Form element)



Concept A **label** is an element containing a text string which can be used to name some other element in the Form. An area in a Form defined as a **label** is totally passive in that it cannot be modified, highlighted, etc. in user mode.

Procedure Select **add> label** from the middle button menu. When the origin cursor appears, corresponding to the upper left corner of the element, move the cursor to the position desired. Press the left mouse button, and while holding it down, draw down and to the right. When the outline is the desired size, release the button.

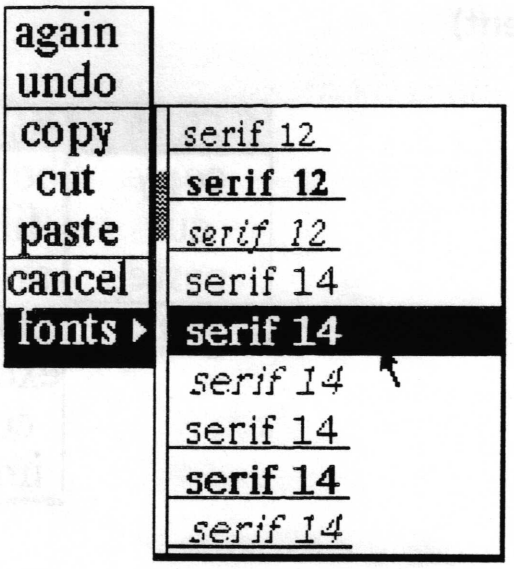
After releasing the button, a QBox will appear:



Bordered determines whether the label element will have a visible border: if **true** {**false**} is selected, a border will {will not} be shown. The border is always one pixel wide.

Label specifies the text which will be displayed. The text may be modified using the standard text operations via the middle mouse button menu:

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Alignment determines where the label text will be displayed relative to the left and right edges of the element.

Name is the internal name used within this Form when referencing this element. It must be unique within this Form. **Name** is of interest to creators of code elements and to programmers.

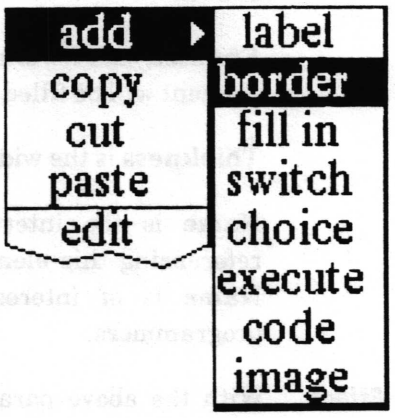
Effect With the parameters pictured, the label generated will be:

Label Text

Related topics Simple text editing

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border (Form element)



Concept

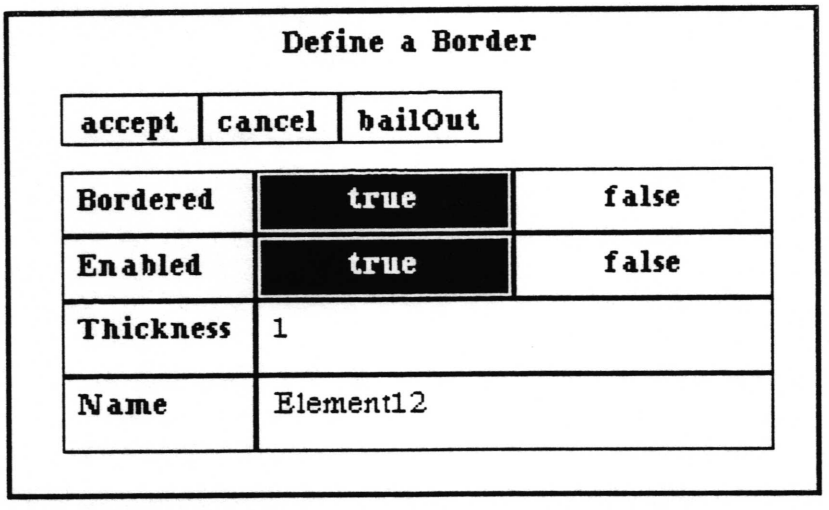
A **border** element allows placing a border (black rectangle) of user specified thickness around one or more elements in the form. Except for the border area, a border element is transparent, allowing any elements beneath it to be seen. Border elements are particularly useful for surrounding functional sections of a form. Here is an example of a two pixel wide border element surrounding six other elements.



Procedure

Select **add> border** from the middle button menu. When the origin cursor appears, corresponding to the upper left corner of the element, move the cursor to the position desired. Press the left mouse button, and while holding it down, draw down and to the right. When the outline is the desired size, release the button.

After releasing the button, a QBox will appear:



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Bordered determines whether the border element will have a visible border: if **true** {**false**} is selected, a border will {will not} be shown.

Enabled has no effect except that if it is false the box of the element will be filled with a cross hash pattern.

Thickness is the width in screen pixels of the border.

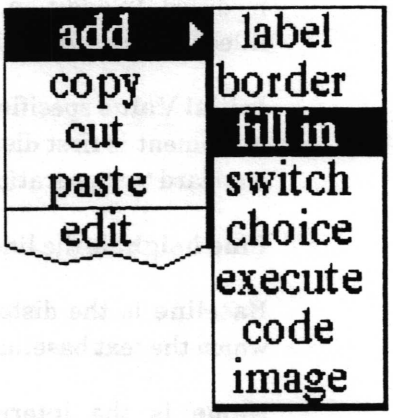
Name is the internal name used within this Form when referencing this element. It must be unique within this Form. **Name** is of interest to creators of code elements and to programmers.

Effect With the above parameters, a border element will be created, causing a one pixel wide rectangle to be displayed in the specified area of the Form.

A border element is not active and not selectable when the Form is in user mode. When in editing mode, the border element gives selection priority to any other elements within its boundary. This means to select the border element itself you must press the mouse button while the cursor is over an area of the border element's box which does not overlap with any other element's box.

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fill in (Form element)



Concept A **fill in** element defines an area within the Form which can be interactively 'filled in' by the user with text in user mode.

Procedure Select **add> fill in** from the middle button menu. When the origin cursor appears, corresponding to the upper left corner of the element, move the cursor to the position desired. Press the left mouse button, and while holding it down, draw down and to the right. When the outline is the desired size, release the button.

After releasing the button, a QBox will appear:

Define a Fill In

accept	cancel	bailOut

Bordered	**true**	**false**
Enabled	**true**	**false**
Initial Value	Replace this text	
Line height	18	
Baseline	15	
Name	Element1	

Bordered determines whether the fill in element will have a visible border: if **true** {**false**} is selected, a border will {will not} be shown. The border is always one pixel wide.

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Enabled specifies whether the displayed text may be modified in user mode. If **true** {**false**} is selected, the text may {may not} be modified. In addition, if it is false, the box of the element will be filled with a cross hash pattern.

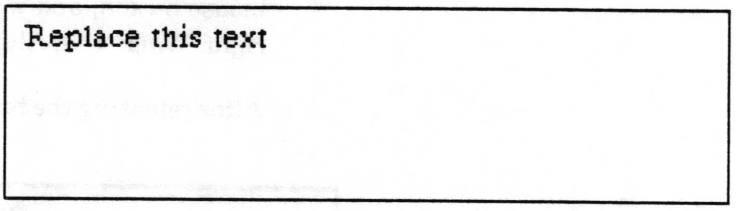
Initial Value specifies the text to be initially shown when the fill in element is first displayed. The text may be modified using the standard text operations via the middle mouse button menu.

Line height is the line – to – line spacing in pixels.

Baseline is the distance in pixels below the top of the line at which the text baseline will be placed.

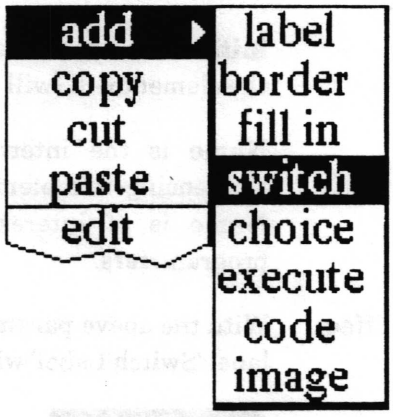
Name is the internal name used within this Form when referencing this element. It must be unique within this Form. **Name** is of interest to creators of code elements and to programmers.

Effect With the above parameters, an editable fill in element will be created:



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switch (Form element)



Concept A **switch** element defines an area within the Form which can be used as an 'on/off' button or notifier. When 'on' the switch element is displayed in reverse video (white text on black background).

Procedure Select **add> switch** from the middle button menu. When the corner origin appears, corresponding to the upper left corner of the element, move the cursor to the position desired. Press the left mouse button, and while holding it down, draw down and to the right. When the outline is the desired size, release the button.

After releasing the button, a QBox will appear:

Define a Switch

accept	cancel	bailOut

Bordered	**true**	**false**
Enabled	**true**	**false**
Label	Switch Label	
initial value	**true**	**false**
Name	Element2	

Bordered determines whether the switch element will have a visible border: if **true** {**false**} is selected, a border will {will not} be shown. The border is always one pixel wide.

Enabled specifies whether the switch state may be modified in user mode. If **true** {**false**} is selected, the switch may {may not} be modified. In addition, if it is false, the box of the element will be filled with a cross hash pattern.

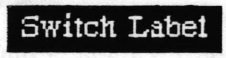
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Label specifies the text which will be displayed. When editing, the text may be modified using the standard text operations via the middle mouse button menu.

initial value specifies the initial state of the switch; **true** {**false**}, the element will {will not} be highlighted.

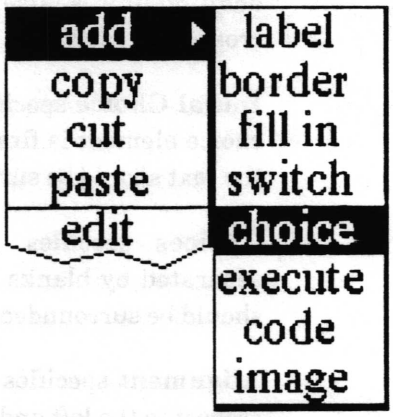
Name is the internal name used within this Form when referencing this element. It must be unique within this Form. **Name** is of interest to creators of code elements and to programmers.

Effect With the above parameters, a switch element with a highlighted label 'Switch Label' will be created:



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choice (Form element)



Concept A **choice** element provides a popup menu to present a specified set of choices to the user. The selected choice will replace the current value.

Procedure Select **add> choice** from the middle button menu. When the origin cursor appears, corresponding to the upper left corner of the element, move the cursor to the position desired. Press the left mouse button, and while holding it down, draw down and to the right. When the outline is the desired size, release the button.

After releasing the button, a QBox will appear:

Define a Choice

accept	cancel	bailOut

Bordered	**true**	**false**	
Enabled	**true**	**false**	
Initial Choice	President		
Choices	President 'Vice President' Secretary Treasi		
Alignment	**LeftFlush**	**Centered**	**RightFlush**
Name	Element2		

Bordered determines whether the choice element will have a visible border: if **true** {**false**} is selected, a border will {will not} be shown. The border is always one pixel wide.

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Enabled specifies whether the displayed text may be modified. If **true** {**false**} is selected, the text may {may not} be modified. In addition, if it is false, the box of the element will be filled with a cross hash pattern.

Initial Choice specifies the text to be initially shown when the choice element is first displayed. If the text is to contain blanks, the text should be surrounded by single quotes.

Choices specifies the menu items. Individual items are separated by blanks. If an item is to contain blanks, that item should be surrounded by single quotes.

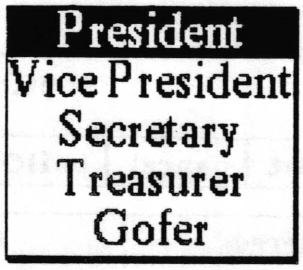
Alignment specifies the positioning of the selected entry with respect to the left and right edges of the element.

Name is the internal name used within this Form when referencing this element. It must be unique within this Form. **Name** is of interest to creators of code elements and to programmers.

Effect With the above parameters, a choice element will be created, whose menu will display the five choices:

[President]

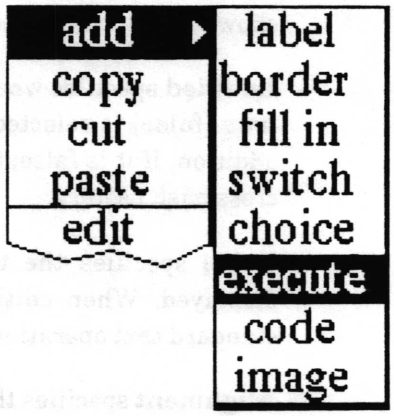
The choice element



The choice menu

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execute (Form element)



Concept An **execute** element is used as a button. It may be selected with the left mouse button to cause execution of a specified function. (In general, use of this feature will require programming support.)

Procedure Select **add > execute** from the middle button menu. When the origin cursor appears, corresponding to the upper left corner of the element, move the cursor to the position desired. Press the left mouse button, and while holding it down, draw down and to the right. When the outline is the desired size, release the button.

After releasing the button, a QBox will appear:

Define a Executor

accept	cancel	bailOut

Bordered	**true**		**false**
Enabled	**true**		**false**
Label	Next Record!		
Alignment	**LeftFlush**	**Centered**	**RightFlush**
Message	a message name		
Name	Element3		

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Bordered determines whether the label element will have a visible border: if **true** {**false**} is selected, a border will {will not} be shown. The border is always one pixel wide.

Enabled specifies whether execution may actually be invoked. If **true** {**false**} is selected, execution may {may not} be invoked. In addition, if it is false, the box of the element will be filled with a cross hash pattern.

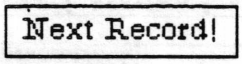
Label specifies the text of the function label which will be displayed. When editing, the text may be modified using the standard text operations via the middle mouse button menu.

Alignment specifies the positioning of the label text with respect to the left and right edges of the element.

Message is the internal (Smalltalk) name of the function to be executed. There are a few built in functions you may use without programming support. These are flash (flashes the window), save (saves the Form), hardcopy (prints the Form), clipForm (copies the Form into the clipboard), edit (switches to Form editing mode), clipContents (copies the contents of all the fill elements into a String and puts it in the clipboard).

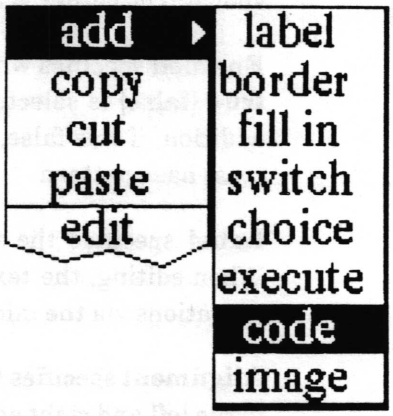
Name is the internal name used within this Form when referencing this element. It must be unique within this Form. **Name** is of interest to creators of code elements and to programmers.

Effect With the above parameters, an execute element will be created, whose message name is unknown – (a message name).



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code (Form element)



Concept A **code** element is used as a button. It may be selected with the left mouse button to cause execution of its code. Almost any piece of Smalltalk code can be used in a code element. A code element may use or change the value of other elements in the form. (In general, use of this feature will require programming support.)

Procedure Select **add> code** from the middle button menu. When the origin cursor appears, corresponding to the upper left corner of the element, move the cursor to the position desired. Press the left mouse button, and while holding it down, draw down and to the right. When the outline is the desired size, release the button.

After releasing the button, a QBox will appear:

Define a Code Button

accept	cancel	bailOut

Bordered	**true**		**false**
Enabled	**true**		**false**
Label	Code Label		
Alignment	**LeftFlush**	**Centered**	**RightFlush**
Code	code to be evaluated		
Name	Element12		

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Bordered determines whether the label element will have a visible border: if **true** {**false**} is selected, a border will {will not} be shown. The border is always one pixel wide.

Enabled specifies whether execution may actually be invoked. If **true** {**false**} is selected, execution may {may not} be invoked. In addition, if it is false, the box of the element will be filled with a cross hash pattern.

Label specifies the text of the label which will be displayed. When editing, the text may be modified using the standard text operations via the middle mouse button menu.

Alignment specifies the positioning of the label text with respect to the left and right edges of the element.

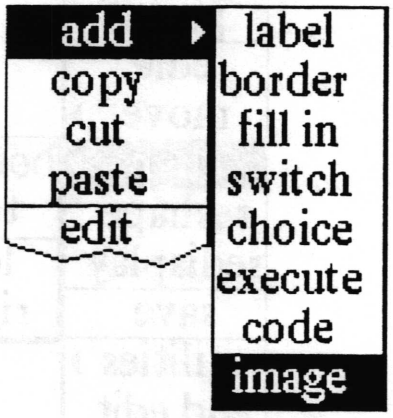
Code is the piece of code to be compiled and executed when a user selects the element. See the section of this chapter entitled "writing code for code elements" for details.

Name is the internal name used within this Form when referencing this element. It must be unique within this Form. **Name** is of interest to creators of code elements and to programmers.

Effect With the above parameters, a code element will be created whose code to be evaluated will cause an error.

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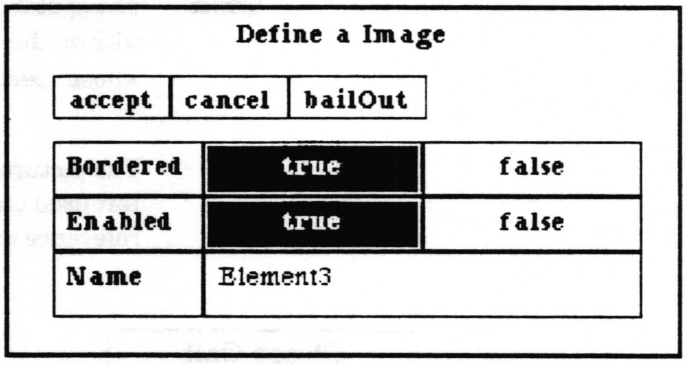
image (Form element)



Concept An **image** element defines an area which can contain a bitmap image.

Procedure Select **add> image** from the middle button menu. When the origin cursor appears, corresponding to the upper left corner of the element, move the cursor to the position desired. Press the left mouse button, and while holding it down, draw down and to the right. When the outline is the desired size, release the button.

After releasing the button, a QBox will appear:



Bordered determines whether the label element will have a visible border: if **true** {**false**} is selected, a border will {will not} be shown. The border is always one pixel wide.

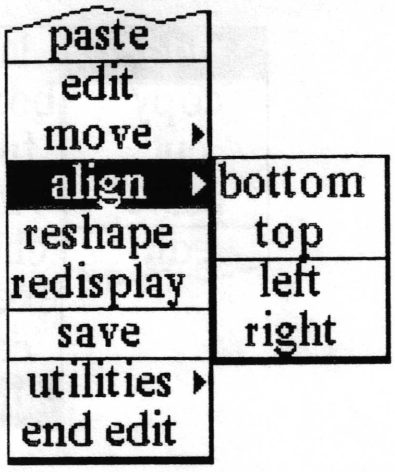
Enabled specifies whether the displayed image may be modified. If **true** {**false**} is selected, the image may {may not} be modified. In addition, if it is false, the box of the element will be filled with a cross hash pattern.

Name is the internal name used within this Form when referencing this element. **Name** is normally only of interest to programmers.

Effect With the above parameters, an image element will be created. An image may then been pasted into the element while in user mode.

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align >

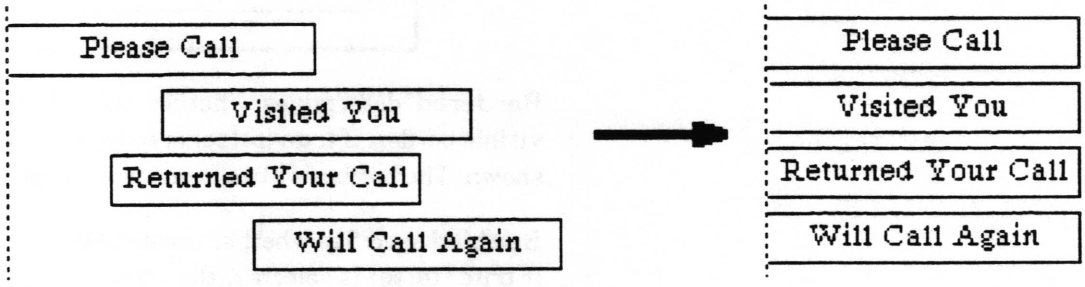


Concept This will align elements with each other.

Procedure Select **bottom**, **top**, **left**, or **right** from the **align >** branch of the middle mouse button menu. The cursor will change to an origin cursor. Frame a rectangle completely around the elements you want to be aligned with each other.

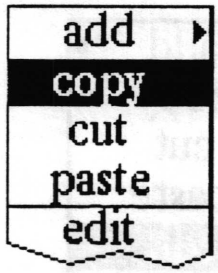
Effect The specified side of all the elements whose boxes are completely within the framed rectangle will be aligned with the element whose specified side is furthest in the specified direction.

The picture below shows a before and after example of **align > left** used on four elements. The dotted line represents a fixed reference axis.



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copy

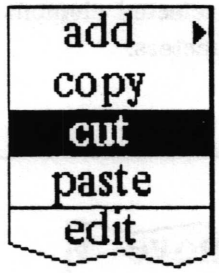


Concept Places a copy of the selected element into the clipboard, from where it can subsequently be pasted into the same form (making a duplicate) or another form.

Procedure Select the element to be copied using the left mouse button. Then select **copy** from the middle mouse button menu.

Effect A copy of the selected element will be placed into the clipboard.

cut



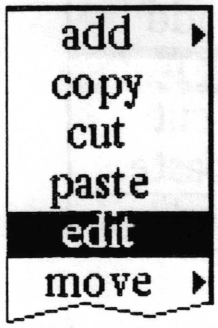
Concept Removes the selected element from the form and places it into the clipboard so that it can subsequently be pasted back into the same form or into another form if desired.

Procedure Select the element to be removed using the left mouse button. Then select **cut** from the middle mouse button menu.

Effect The selected element will be deleted from the Form and placed into the clipboard.

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edit



Concept Displays and allows editing the parameters of the selected element.

Procedure Select the element using the left mouse button. Then select **edit** using the middle mouse button. The parameter QBox for that type of element will be displayed with the current parameters of that element. See the "add>" section for type of element being edited for details on the QBox parameters. Make any desired changes to the parameters, then select **accept**.

Effect The selected element will be redisplayed using the new set of parameters.

end edit



Concept Exits editing mode and returns to user mode.

Procedure Select **end edit** from the middle mouse button menu.

Effect User mode will be entered.

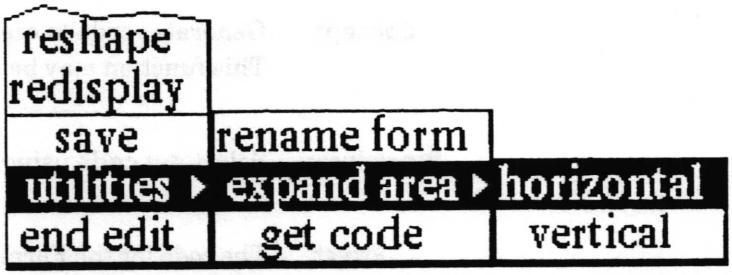
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expand area>

Concept Expands the available area in which one may lay out Forms elements without having to frame the window larger.

Procedure Choose one of the two subcommands: **horizontal** or **vertical**.

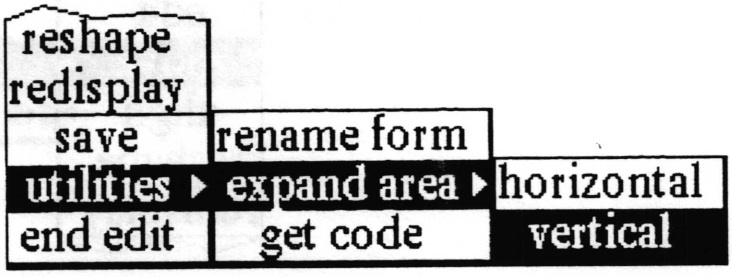
Effect Adds to the available space to lay out Forms elements.



Concept Adds more horizontal space for element layout.

Procedure Choose the **expand area> horizontal** command from the middle button menu.

Effect Makes the available area for layout wider.



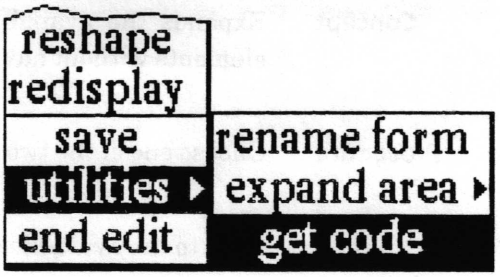
Concept Adds more vertical space for element layout.

Procedure Choose the **expand area> vertical** command from the middle button menu.

Effect Makes the available area for layout taller.

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get code

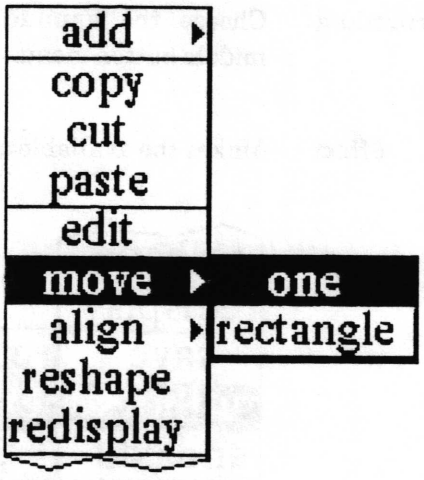


Concept Generates code to create the Form and places it in the clipboard. This function may be useful to programmers.

Procedure Select **get code** using the middle mouse button.

Effect The code for the Form is placed in the clipboard.

one



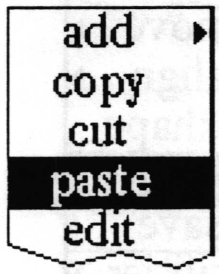
Concept Changes the position of the selected element.

Procedure Use the left mouse button to select the element to be moved. Then select **one** from the **move>** branch of the middle mouse button menu. The cursor will change to a crosshair centered within an outline of the element. Move the cursor until the outline of the element is in the desired location and click the left mouse button.

Effect The selected element will be moved and redisplayed.

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paste

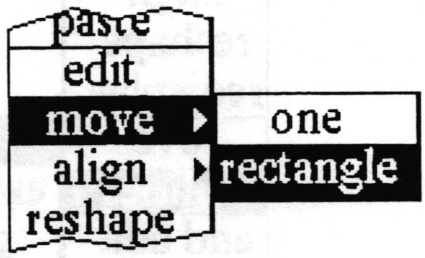


Concept If the next entry in the clipboard is a forms element, it will be placed on the Form.

Procedure Select **paste** from the middle mouse button menu. If the next clipboard entry is a forms element, the cursor will change to a crosshair centered within an outline of that element. Move the cursor until the outline of the element is in the desired location and click the left mouse button.

Effect The forms element is added to the Form at the specified location.

rectangle



Concept Moves all the elements within a specified rectangle as a group (maintaining their spatial relationship to one another) to another location on the Form.

Procedure Select **rectangle** from the **move>** branch of the middle mouse button menu. An origin cursor will appear. Frame a rectangle completely around the boxes of all the elements you want to move. After completing the framing, an outline of the framed area will be attached to the origin cursor. Move the cursor until the outline is in the desired location for the elements and click the left mouse button.

Effect The elements whose boxes were completely contained within the framed rectangle will be moved and redisplayed.

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redisplay

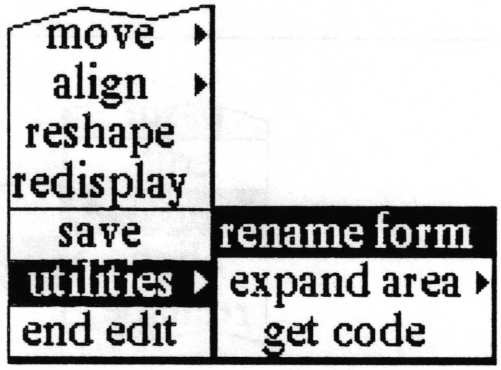


Concept Cleans up the display of the Form, redisplaying each element.

Procedure Select **rediplay** from the middle mouse button menu.

Effect All Form elements will be redisplayed.

rename form



Concept Changes the name of the Form's model. This is really only useful to programmers.

Procedure Select **rename form** from the middle mouse button menu. A fill in will appear requesting a new name for the Form. Enter the new name and **accept** or type a carriage return.

Effect The internal name of the Form will be changed.

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reshape



Concept Changes the shape and position of the selected element.

Procedure Use the left mouse button to select the element to be reshaped. Then select **reshape** from the middle mouse button menu. An origin cursor will appear. Move the cursor to the desired location of the top lefthand corner of the element, press the left mouse button, and hold it down while pulling down and to the right until the outline is the desired size of the element.

Effect The selected element will be reshaped, relocated, and redisplayed.

save



Concept Causes the Form to be saved to its file on the disk.

Procedure Select **save** from the middle mouse button menu.

Effect The Form and all associated details will be written to its disk file.

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Right mouse button menu

The right mouse button brings up the standard window popup menu fully described in the *System Interface* chapter of this document.

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Glossary

alignment Determines where the text will be displayed relative to the left and right edges of the element in one of three choices, LeftFlush, Centered, or RightFlush.

baseline Where the text baseline will be placed relative to the top of the line, expressed in pixels.

border Determines whether a one pixel wide border will be displayed around the edges of the element.

choice A type of form element which provides a menu of its possible values for the user to choose from.

code A type of form element which makes something happen when it is selected with the left mouse button while in user mode. The element contains a piece of Smalltalk code which is executed when the element is selected.

edit mode The forms mode in which the Form Editor middle mouse button menu is available. This menu provides operations to create, modify, position and remove Form elements.

element An entity in a form. A form element occupies a rectangular area on a form, known as its *box*. It has a name and some properties or parameters which determine how it is displayed and how it interacts with a user. The set of parameters is determined by the *type* of the element.

enabled Determines whether a form element will interact with a user when the form is in user mode.

execute A type of form element which makes something happen when it is selected with the left mouse button while in user mode. The element contains a Smalltalk message selector which is sent to the form controller when the element is selected.

expand To increase the area of the form available for placement of form elements.

fill in A type of form element which contains text which a user can add to or modify when the form is in user mode.

gridding Gridding is provided to simplify editing, positioning and sizing elements. It forces all of those operations to be done in multiples of five screen pixels.

image A type of form element which holds a bitmap image which is pasted into it.

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label A type of form element containing a text string which may be used to title or provide comment about the form or other elements within it. An area in a Form defined as a label is totally passive in that it cannot be modified in user mode.

left shift key Normally, the shift key on the left hand side of the keyboard. On some machines, however, this key is actually a different key elsewhere on the keyboard. See the release notes.

scrolling Moving the area of the form which is visable within the form window.

switch A type of form element which can be used as an 'on/off' button or notifier. The on state is indicated by displaying the box and its contents in reverse video.

type The type of an element determines the way it is displayed and its behavior. Element types are: label, border, fill in, switch, choice, execute, code, and image.

user mode The forms mode in which the Form may be filled in interactively. The Form Editor is inactive.

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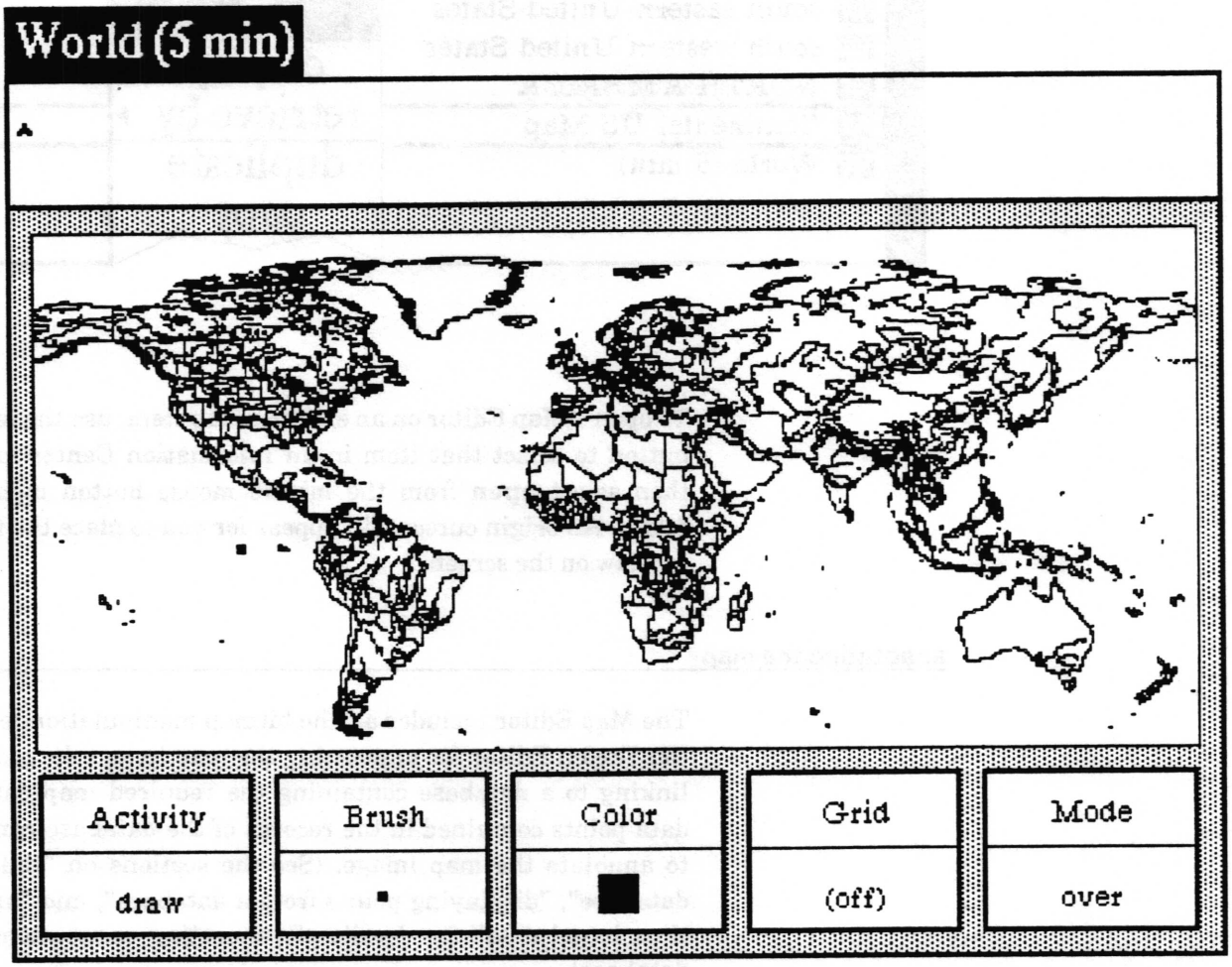
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Map Editor

The Map Editor provides the capability of displaying and annotating images generated from a geographic database of vector data. It has all the bitmap editing capabilities of the Sketch Editor, plus facilities related to geographic locations. Maps can be linked to Analyst databases for display and addition of information related to geographic points and animation of time based data.

Window layout

The Map Editor window layout is the same as the Sketch Editor window layout described in the *Sketch Editor* chapter.

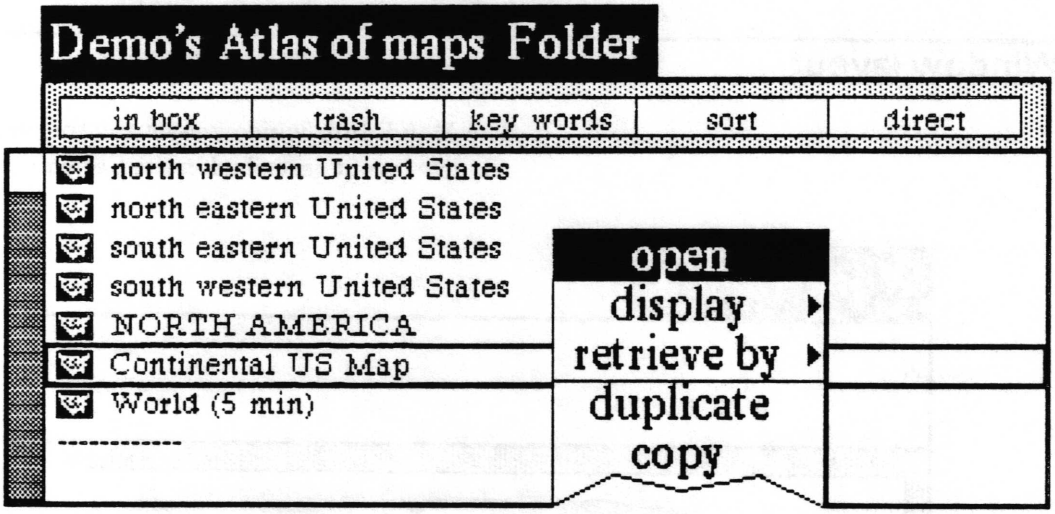


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Map Editor usage

opening a Map Editor

Except by using the graphics terminal emulator to create a non-geographically based map item in an Information Center, you cannot create a map from scratch. A Map Editor can only be opened from an existing item in an Information Center, or by redrawing or zooming a map within an open Map Editor.



To open a Map Editor on an existing map item, use the left mouse button to select that item in an Information Center folder and then select **open** from the middle mouse button menu of the folder. An origin cursor will appear for you to place the fixed size window on the screen.

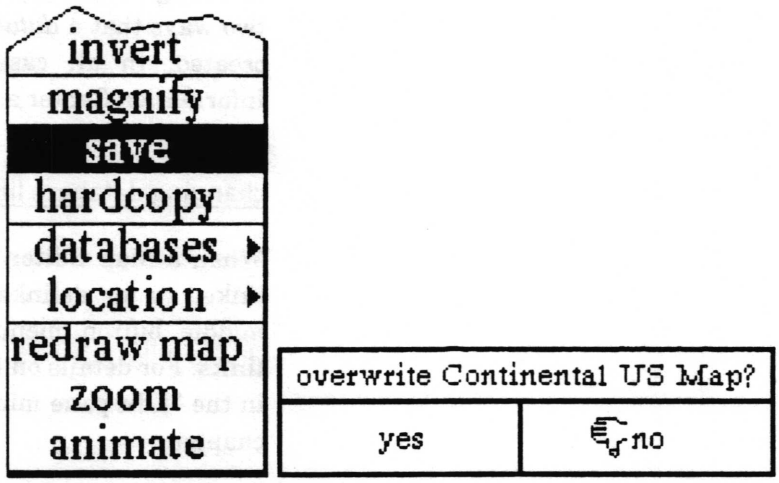
annotating the map

The Map Editor includes all the bitmap manipulation features of the Sketch Editor for annotating the map image. In addition, by linking to a database containing the required map data fields, data points contained in the records of the database can be used to annotate the map image. (See the sections on "linking to a database", "displaying points from a database", and "animating time based data" for details of generating annotations from a database).

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saving an annotated map

To save an annotated map, select **save** from the middle button menu of the edit pane. A confirmer will appear asking whether you wish to overwrite the existing image. If you select *yes*, the original map image is replaced by your annotated version. If the map is a basic map provided to you, you should select *no*, because otherwise it may be a nuisance to reaquire the original plain map, and because your annotated version might be accidentally written over by someone reloading basic data files.



If you select *no*, a **File request** QBox will appear for you to fill out with the information necessary to create a new map item and file it in one or more Information Centers.

changing the size of the map

To change the size of a map it must be redrawn from its vector data. The edit pane menu option **redraw map** will create a new map of the same geographic area at the size you specify. For details on the use of this option, see "redraw map" in the "Edit pane middle mouse button menu" subsection of this chapter.

zooming into an area of the map

Because the map image is drawn from vector data, you can select an area of the map and have it redrawn at a different scale – generally larger, but smaller is also allowed. Depending on the resolution of the vector data and the scale of the zoom, this can provide much more information about an area where the resolution is high enough, or a bunch of useless lines as the resolution is exceeded.

The edit pane menu option **zoom** will create a new map of the geographic area you specify. For details on the use of this option,

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see "zoom" in the "Edit pane middle mouse button menu" subsection of this chapter.

linking to a database

By linking the map to a database containing the required map data fields (a *map database*), data points contained in the records of the database can be used to annotate the map image and to simulate the movement of objects across the map over a period of time (animation). New records with a location generated by selecting on the map can be added to a linked database. There are two ways that a *database link* from a map to a database may be created. In all cases, the database must be in the same Information Center as the map.

changing database links from within a Map Editor

When a Map Editor is open on a map, the map can easily be linked to (or delinked from) a database though the edit pane middle button menu option **databases> modify database links**. For details on how to use this, see "modify database links" in the "Edit pane middle mouse button menu" subsection of this chapter.

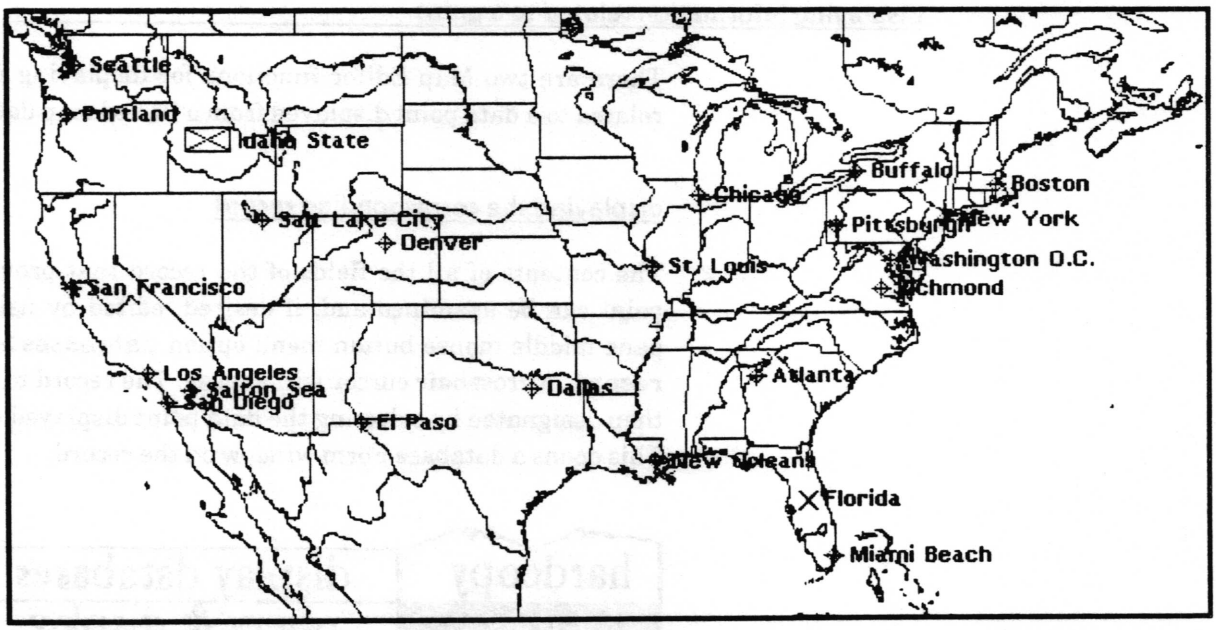
changing database links in an Information Center structure tree

When an Information Center structure tree window is open and contains both the map and database items, a database link can be created by adding a link from the map to the database of type *database*. If *database* type links are displayed, they may also be removed in this window.

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displaying points from a database

Aside from animation (discussed below), there are two ways of displaying data points from the records of a linked database. Both require that the database be linked to the map and contain records with a minimum set of required fields, including latitude, longitude, a label and an icon. Such databases are sometimes referred to as *map databases*. Both functions display the icon and label of a record with the icon centered over the geographic location specified in the record.



A data point for every record in a database whose location is within the boundary of the map will be displayed by the edit pane middle mouse button menu option **databases> display databases**.

The edit pane middle mouse button menu option **databases> query & display** will do the same thing for every record meeting the requirements of a query you provide it.

For details on how to use these functions, see "databases> display databases" and/or "databases> query & display" in the "Edit pane middle mouse button menu" subsection of this chapter.

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adding a point to a database

The edit pane middle mouse button menu option **databases> add to database** allows you to select a location on the map to provide the latitude and longitude of a new record and add it to a linked map database.

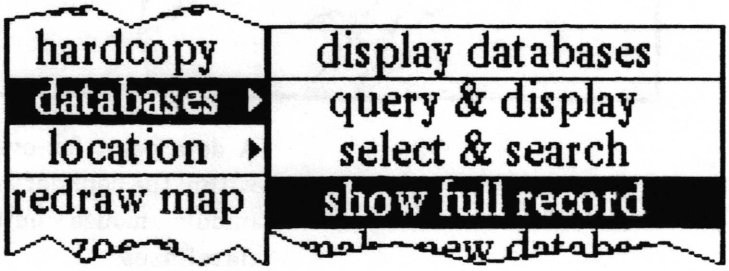
For details on the use of this function, see "databases> add to database" in the "Edit pane middle mouse button menu" subsection of this chapter.

displaying information related to a point

There are two Map Editor functions for displaying information related to a data point displayed from a linked map database.

displaying the corresponding record

The contents of all the fields of the record that provided a data point can be examined and, if desired, edited by using the edit pane middle mouse button menu option **databases> show full record**. A crosshair cursor will appear. The record to be shown is then designated by selecting the data point displayed on the map. This opens a database Form window on the record.

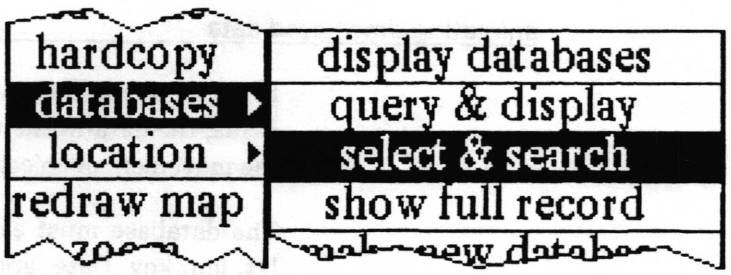


For more details on the use of this function, see "databases> show full record" in the "Edit pane middle mouse button menu" subsection of this chapter.

searching an Information Center for related data

The Information Center the Map Editor was opened from can be searched for any item label or key word containing the value of the *key* field in a selected record. Selecting the menu option **databases> select & search** provides a crosshair cursor to select the data point. The Information Center is then searched. If the search finds anything, an Information Center holder window containing the found items is opened. Otherwise, the user is provided an opportunity to create a new folder using the search key so that the folder will be found on subsequent searches from that record.

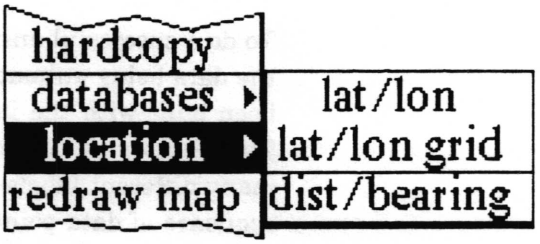
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For more details on the use of this function, see "databases> select & search" in the "Edit pane middle mouse button menu" subsection of this chapter.

locating a point on the map

There are three Map Editor functions for determining the geographic location a given point on the map.



The edit pane middle mouse button menu option **location> lat/lon** provides a crosshair cursor to select one or more points on the map with the left mouse button. As long as the button is held down, the latitude and longitude of the point beneath the crosshair will be displayed in the text pane above. The latitude and longitude of the last selection will remain in the text pane after the button is released.

The middle button menu option **location> lat/lon grid** will draw grid lines on the map image, spaced at a regular interval of degrees specified in a prompter it provides.

The middle button menu option **location> dist/bearing** displays the distance in nautical miles, and bearing in degrees, from an initial point you select on the map to one or more other points. For instance, selecting San Francisco as the initial point and Salt Lake City as the final point gives a distance of 525.24 and a bearing of 65.5. After selecting the initial point with the crosshair cursor, the distance and bearing from that point to the point currently beneath the crosshair will be displayed in the text pane above as long as the mouse button is held down. When it is released, the last values displayed will remain in the pane.

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animating time based data

If the map is linked to a database containing the necessary data fields, the data in the records can be animated (used to simulate the movement of objects across the map over a period of time).

The database must contain fields with the names: Label, Icon, lat, lon, key, Date, and Time. These fields will automatically be entered in a new database created with the Map Editor's **databases> make new database** menu option. The value of all the fields except the key field must contain data in all the records, or the animation will not work. Since the only control over which records of a database are used in the animation is the span of time (there is currently no query&animate function), if you wish to use only a subset of the data in a database and/or to save the records in a different order, use **utilities>make new database** in the Database window to create a new database with only those records for use by the animation.

To do a successful animation, you must have some knowledge of the data being animated. Generally, the database needs to have been built with the intention of being able to animate from it. The number of objects being animated is determined by how many different labels or icons there are – in other words, each sequence of data points that is to be displayed in time needs to have a separate and distinct label or a separate and distinct icon. After selecting **animate** from the middle button menu and then the database to be animated, you will have to answer a question about whether to group the data by icon. It is asking whether to use the icon as a determinant of distinct objects.

All the data points grouped as an object, by virtue of their label or icon, which have the same values of Date and Time will be displayed at one time and can be linked together with one bit wide lines using the *Connection* and *Open* animation parameters. The order in which the points are connected depends upon the order in which they occur in the database (the order they will appear in the database hit list as a result of the Database window's **show all records** menu option).

The mechanical details and parameter definitions for doing the animation itself can be found under "animate" in the "Edit pane middle mouse button menu" subsection of this chapter. Here is an example to try to add some clarity to how to set up for animation.

Suppose you want to watch the progress of two weather fronts. If you use different icons (say *J* and *H*) to distinguish them from each other, you can use the label to carry some other type of information (say temperature) which you will have the option to display. For each front, you would enter a sequence of data points corresponding to its location for each point in time.

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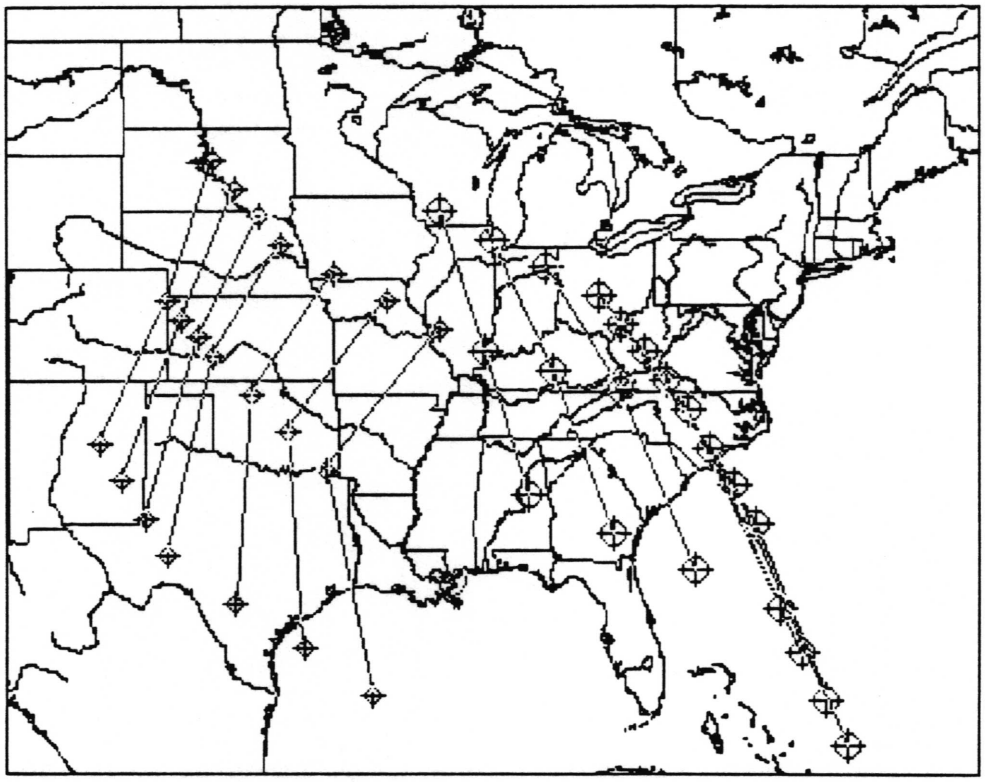
Here is an example. The following data produced the picture that follows it using the parameters shown in the QBox that follows it.

Weather front 1

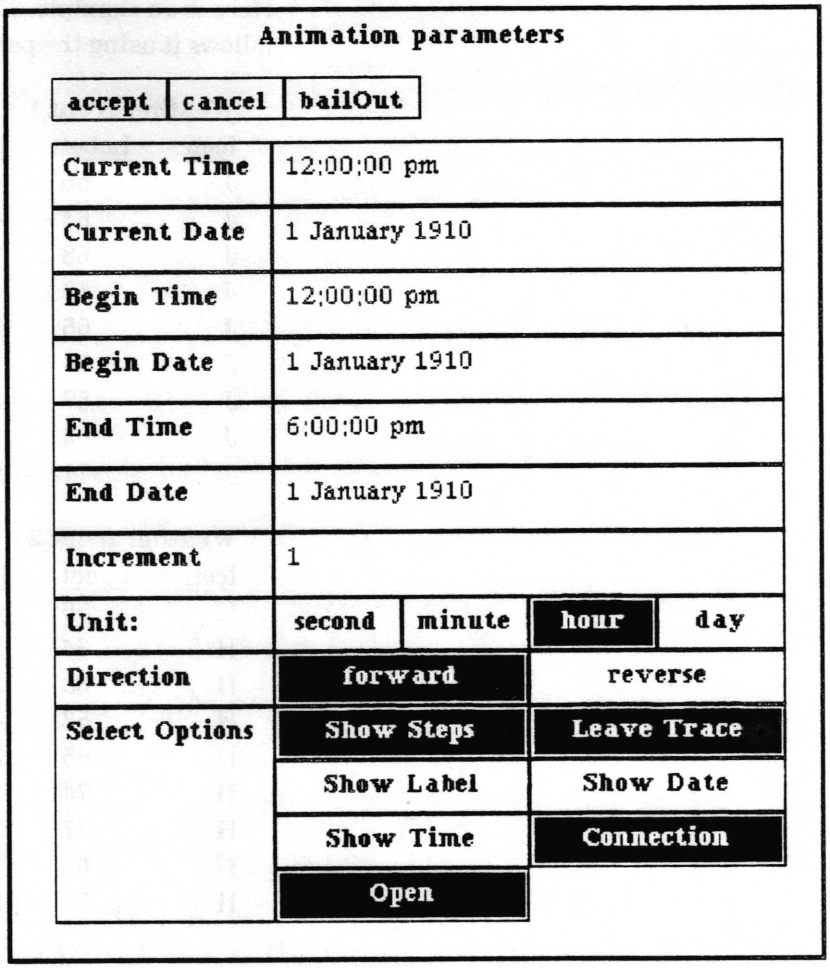
Icon	Label	lat	lon	Date	Time
J	55	45	260	January 1, 1910	12:00 pm
J	64	40	258	January 1, 1910	12:00 pm
J	68	35	255	January 1, 1910	12:00 pm
J	58	42	263	January 1, 1910	3:00 pm
J	65	38	260	January 1, 1910	3:00 pm
J	74	31	258	January 1, 1910	3:00 pm
J	57	39	270	January 1, 1910	6:00 pm
J	63	34	265	January 1, 1910	6:00 pm
J	71	26	267	January 1, 1910	6:00 pm

Weather front 2

Icon	Label	lat	lon	Date	Time
H	55	43	270	January 1, 1910	12:00 pm
H	64	38	272	January 1, 1910	12:00 pm
H	68	33	274	January 1, 1910	12:00 pm
H	58	40	277	January 1, 1910	3:00 pm
H	65	36	281	January 1, 1910	3:00 pm
H	74	29	285	January 1, 1910	3:00 pm
H	57	37	280	January 1, 1910	6:00 pm
H	63	32	284	January 1, 1910	6:00 pm
H	71	24	288	January 1, 1910	6:00 pm

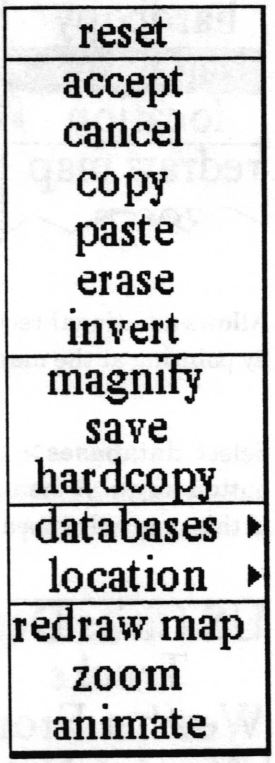


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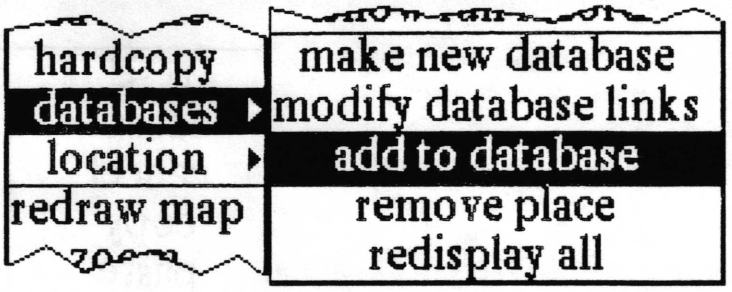
Edit pane middle mouse button menu



The first ten options, **reset**, **accept**, **cancel**, **copy**, **paste**, **erase**, **invert**, **magnify**, **save**, and **hardcopy** are as defined in the Sketch Editor and will not be repeated here. Only those options specifically pertaining to the map functions of the window are covered in this section.

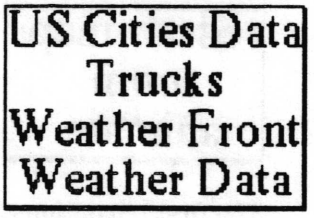
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add to database

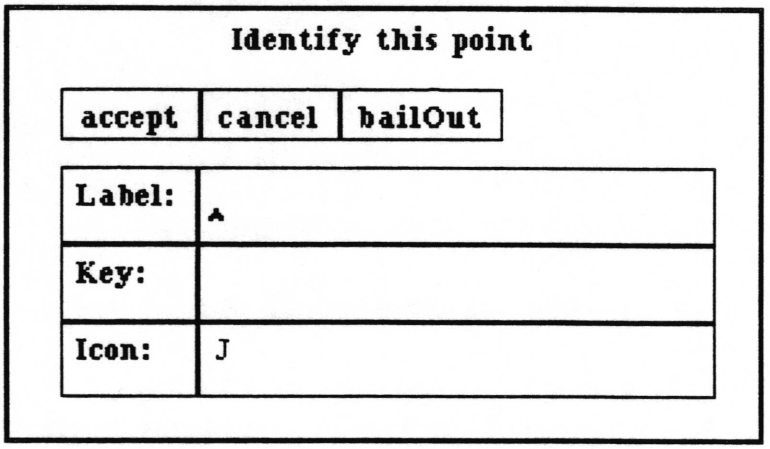


Concept Allows additional records, with positional information generated by pointing at the map, to be added to the database of your choice.

Procedure Select **databases> add to database** from the middle mouse button menu. A menu containing the databases currently linked to this map will appear.



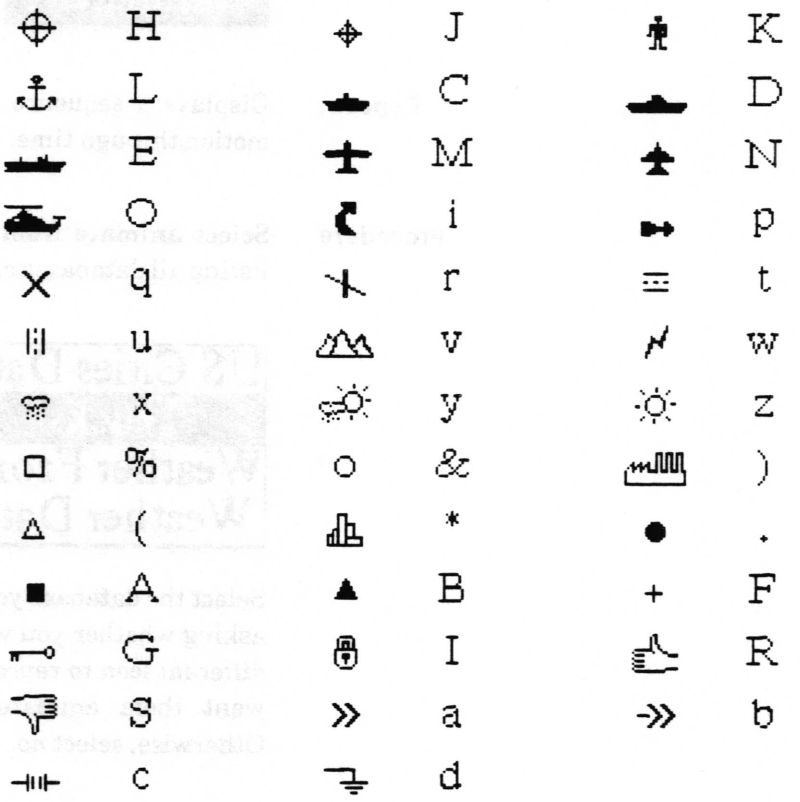
Select the database you want to add a record to. The cursor will become a crosshair. Place the crosshair over the location the record will reference and click the left mouse button. You will get a QBox requesting information for the other data fields required for map databases.



Label is what will appear when the data point is displayed on a map. **Key** is primarily used for searching an Information Center for related information. One or two letters are used to identify the **Icon** to be used when displaying the point in the Map Editor. If

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two letters are specified, the first icon will appear above the second icon when the point is displayed on the map. The correspondence between letters and icons is shown in the table below. You can also find out what the letter corresponding to an icon is by selecting the icon in the Brush button (do *not* copy it) and then pasting into a text window.

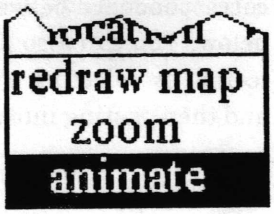


Effect Adds a record to the selected database with the latitude and longitude of the point you selected. The label, key, and icon fields in the record have the values you provided. Any other fields in the record are left empty; you will need to edit the database or **show full record** on the new data point to fill them in.

Related topics adding a point to a database, modifying database links, make new database

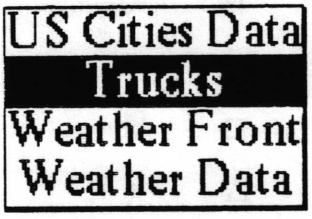
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animate

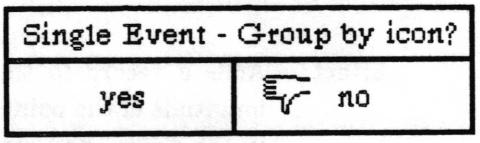


Concept Displays a sequence of position based information to simulate motion through time.

Procedure Select **animate** from the middle mouse button menu. A menu listing all databases currently linked to the map will appear.

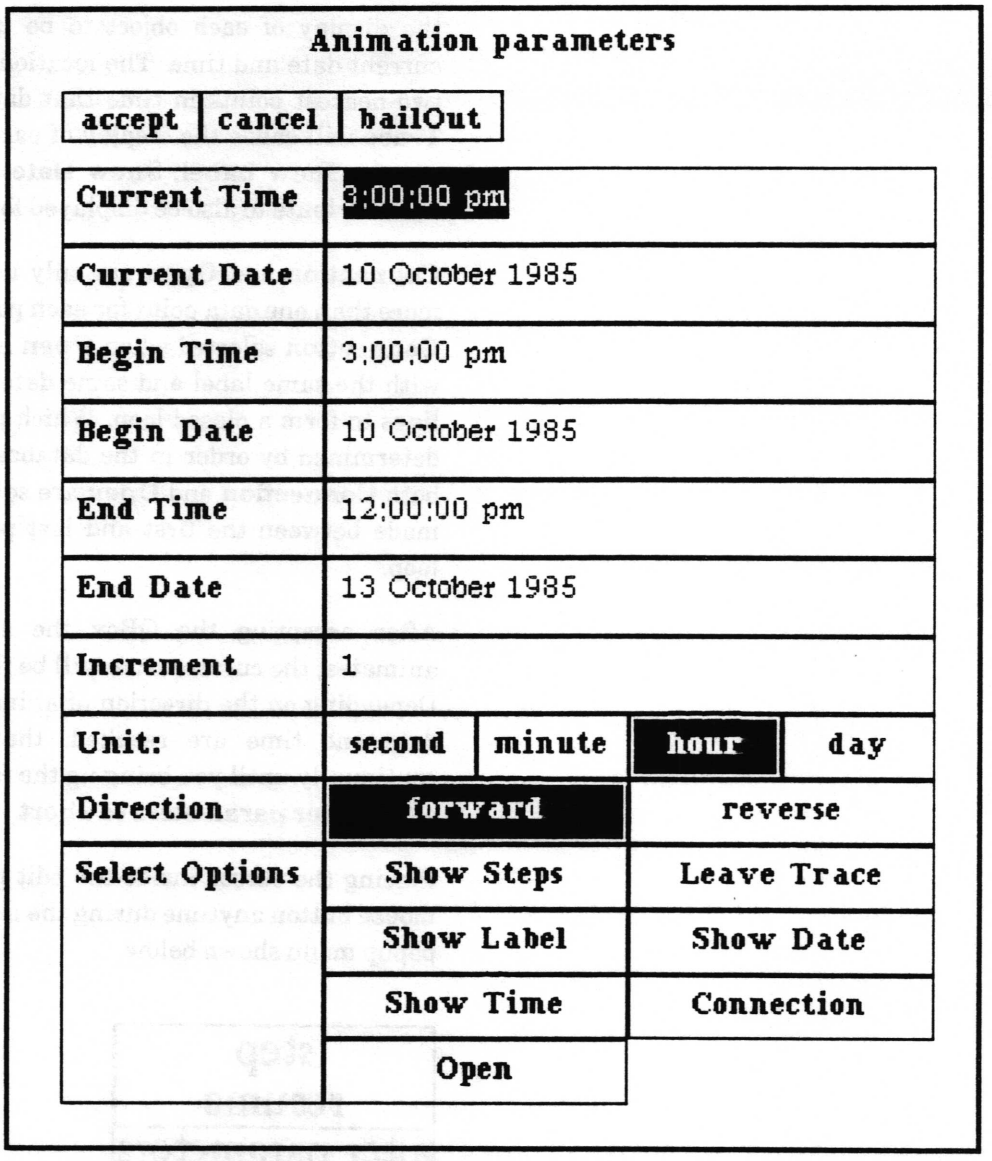


Select the database you want to animate. A confirmer will appear asking whether you want to "group by icon?". If you have used a different icon to represent different objects in your data, and you want them animated as separate objects, then select *yes*. Otherwise, select *no*.



After making your selection you will see a message, "reading in data, please wait," displayed in the map text pane. After the data is read in, an **Animation parameters** QBox will appear.

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Current Time and **Current Date** represent the point in time currently being animated. Because animation has not yet started, these are defaulted to **Begin Time** and **Begin Date**, which always default to the earliest time and date of any record in the database. The **End Time** and **End Date** always default to the values of the last time and date in the database. By changing the values of start, end, and current time and date, you can cause the animation to only go across a subset of the time span represented by all the records in the database.

Increment is the time interval (measured in the units selected in **Unit**) at which the location of each object being animated will be calculated and displayed if **Show Steps** is selected.

If none of the **Select Options** is selected, the icon of each object will be displayed as the current date and time hits (reaches) the date and time in a record. When the next hit occurs, the display will be removed from the older location. **Show Steps** will force

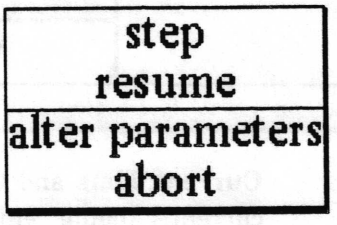
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the display of each object to be updated every **Increment** of current date and time. The location is extrapolated based on the two nearest points in time that data actually exists for. **Leave Trace** will cause the display of each data point to be left on the screen. **Show Label, Show Date,** and **Show Time** each cause that attribute to also be displayed for each data point.

Connection and **Open** are only useful for data where there is more than one data point for each point in time. If this is the case, **Connection** selected when **Open** is not will cause all the points with the same label and same date and time to be connected by lines to form a closed loop. Which point is connected to which is determined by order in the database (1–2, 2–3, 3–4, 4–1). If both **Connection** and **Open** are selected, no direct connection is made between the first and last points, so it displays an open loop.

After accepting the QBox the animation will begin. As it animates, the current time will be flashed in the text pane above. Depending on the direction of animation, when the end or begin date and time are reached, that point will be redisplayed continually until you bring up the following animation menu and either **alter parameters** or **abort**.

Placing the cursor inside the edit pane and pressing the middle mouse button anytime during the animation process produces the popup menu shown below.



step
Calculates the next step in the animation sequence and displays the result. This menu then reappears.

resume
Resumes the animation.

alter parameters
Brings up the **Animation parameters** QBox so you may change parameters. When the QBox is accepted, the animation will be restarted with those parameters.

abort
Ends the animation session entirely.

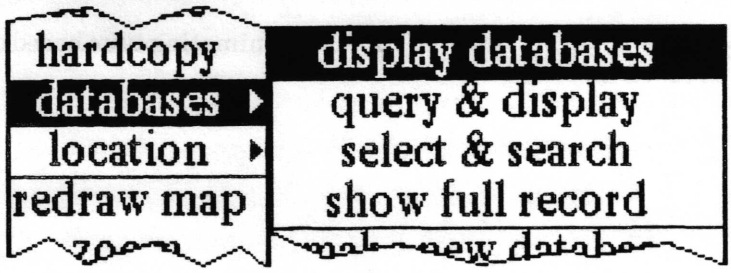
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Effect One or more icons representing objects appear to move across the map.

Related topics animating time based data, modify database links.

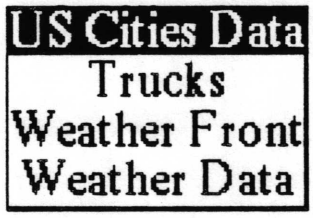
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display databases



Concept Displays a data point for each record of a database containing geographic related information.

Procedure Select **databases> display databases** from the middle mouse button menu. A menu appears listing all the databases currently linked to the map. Select the name of the database.

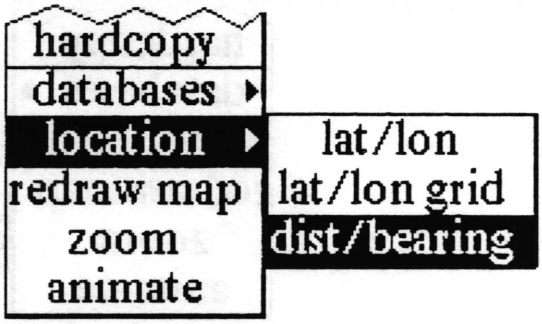


Effect The icon and label of each record in the selected database whose location is within the boundaries of the map is displayed with the icon centered on the location on the map designated by the *lat* and *lon* fields of the record. This means that the database must have the minimum required map fields (Label, Icon, lat, lon, key – see make new database).

Related topics linking to a database, displaying points from a database.

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dist/bearing

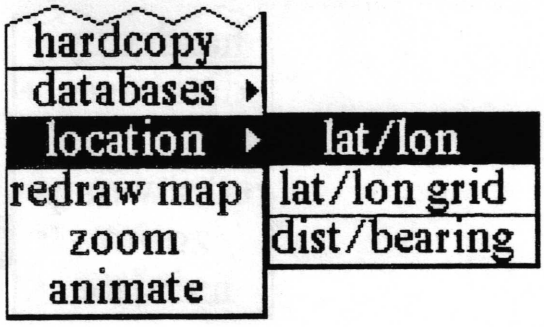


Concept Determines the distance and bearing between two points on a map.

Procedure Select **location > dist/bearing** from the middle mouse button menu. The cursor becomes a crosshair. Place the crosshair at the point on the map you wish to measure from. Press and hold the left mouse button down and move the mouse to position the crosshair at the point you want to measure to. A line connecting the two points appears as the crosshair moves across the map. As you move, the distance (in nautical miles) and the bearing will be displayed in the text pane above. When you release the left mouse button the final distance and bearing is left displayed in the text pane.

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lat/lon



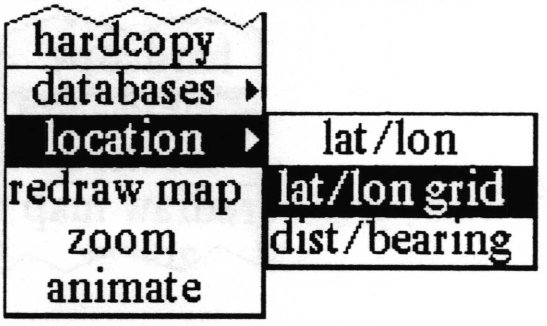
Concept Determines the latitude and longitude of any point on the map.

Procedure Select **location> lat/lon** from the middle mouse button menu. The cursor becomes a crosshair. Place the crosshair anywhere on the map and press the left mouse button.

Effect The latitude and longitude of the point beneath the crosshair is displayed in the map text pane. As long as you hold the button down, you can move around the map and the lat/lon display in the text pane will update. When the button is released, the final location will remain displayed.

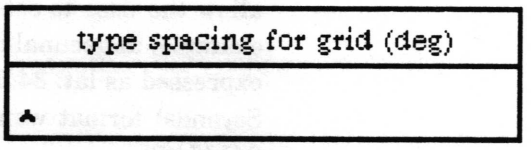
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lat/lon grid



Concept Displays a latitude/longitude grid on the map.

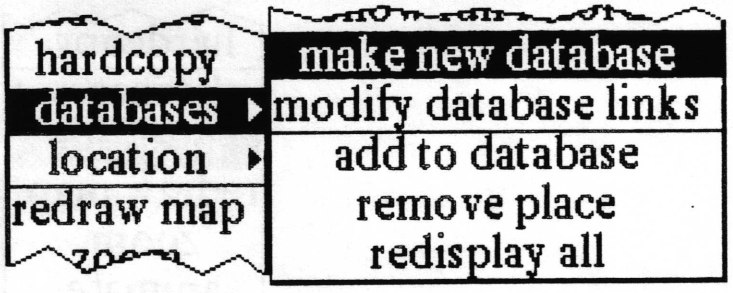
Procedure Select **location> lat/lon grid** from the middle mouse button menu. A prompter appears for you to specify the grid spacing you want. Type in the number of degrees.



Effect Single bit thick lines will be displayed on the map for every latitude and longitude that is a multiple of the specified spacing.

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make new database



Concept Creates a new database with the appropriate fields for a map related display.

Procedure Select **databases> make new database** from the middle mouse button menu. A **File request** QBox will appear for you to fill in with the information necessary to create the database and file it in one or more Information Centers. The following choice will allow the user to select the format of the lat and lon fields. For example, in decimal degree format, the location of Los Angeles is expressed as lat: 34.049 lon: 241.75. The DMS (Degrees Minutes Seconds) format would show the location as lat: 340054N lon: 2414549E

Express latitude and longitude in decimal degrees?	
yes	no

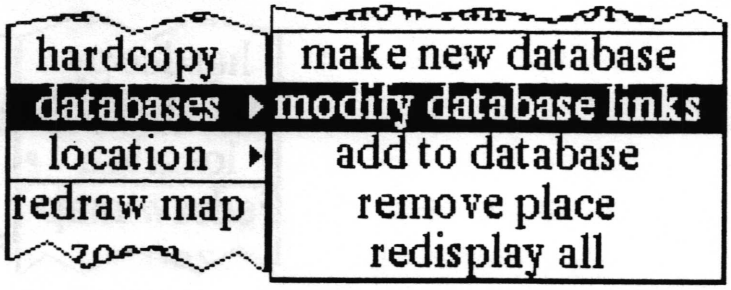
Effect After accepting the QBox and specifing the lat/lon format, the database will be created and filed in the designated Information Center(s). If it is filed in the same Information Center as the Map Editor was opened from, it will be linked to the map by a database link. The new database will have no records, but will have the required fields for use as a map database (Label, Icon, lat, lon, key, Date, Time).

The Label field is a 20 character string.
The Icon field is a 2 character string.
The key field is a 20 character string.
The Date field is a 18 character date
The Time field is a 12 character time.

If latitude and longitude are expressed in decimal degrees both lat and lon fields are 10 character numbers. If in DMS both fields are 10 character strings.

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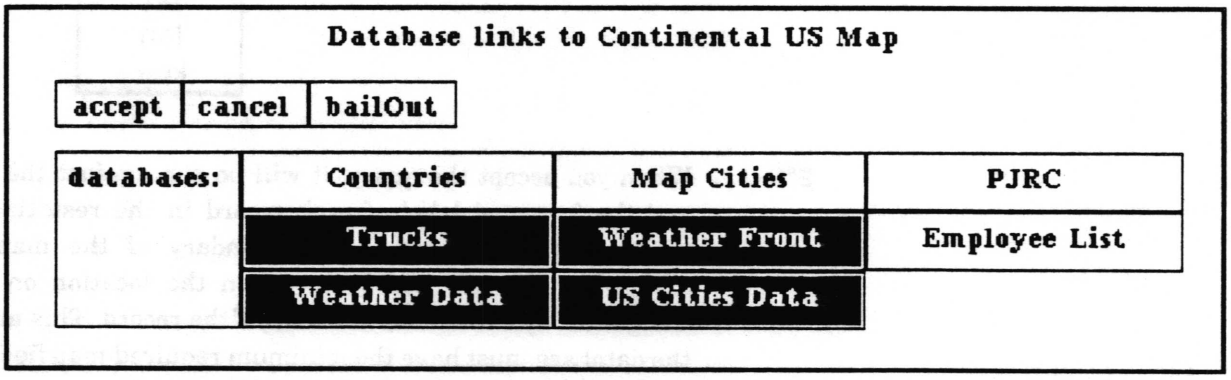
modify database links



Concept Allows you to make and break this map's links to databases in the Information Center it was opened from.

In order to use any of the map features that access a database, the database must be linked to the map with a database link. The names of the linked databases appear in a menu used by several of the map database functions which ask you to specify the name of a database. Since only databases with the required field names and data will be useful in a map, you should only make links to those databases.

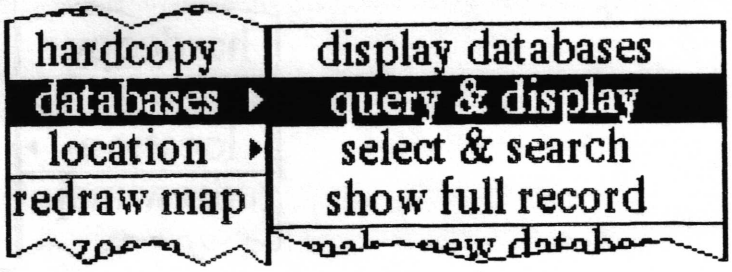
Procedure Select **databases> modify database links** from the middle mouse button menu. A **Database links** QBox appears. It displays every database in the Information Center you opened the Map Editor from. The names of databases this map is currently linked to are selected (displayed in reverse video). By selecting other database names, you can cause links to be made to those databases. By selecting the name of a currently linked database so it becomes unhighlighted, you can remove the link.



Effect When you accept the QBox, the database links between the map being edited and databases in the same Information Center are defined.

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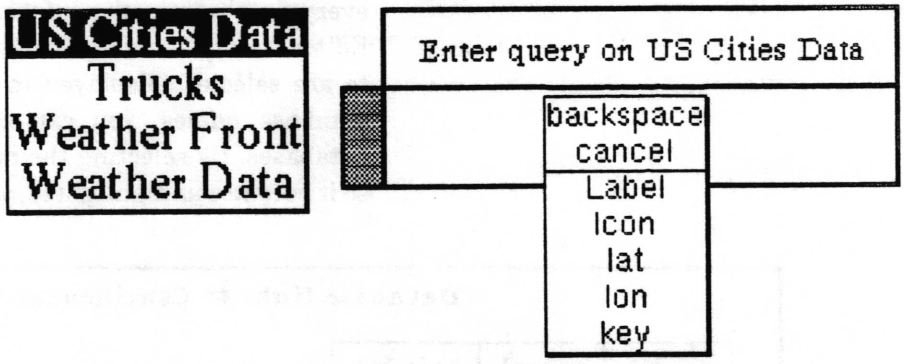
query & display



Concept Queries a database and displays a data point for each record hit (matched) by the query.

Procedure Select **databases> query & display** from the middle mouse button menu. A menu appears listing all the databases currently linked to the map. Select the name of the database to be queried.

A querier will appear for you to use in constructing a query on the database you selected. The querier will provide you with a series of menus on the middle mouse button which will lead you through the creation of the query. For more details on using the querier, see the *Database* chapter of this documentation.

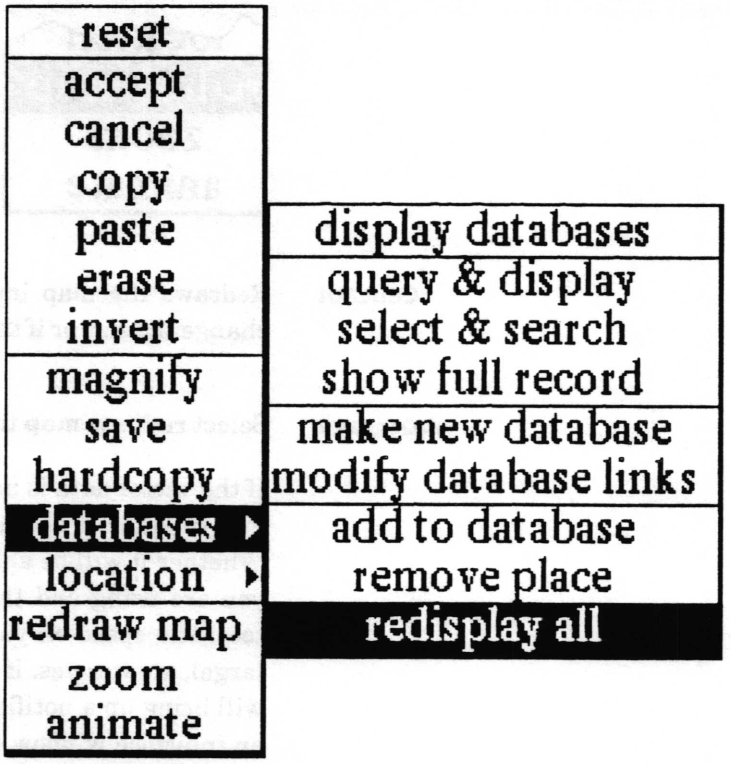


Effect When you accept the query, it will be run against the database and the icon and label of each record in the resulting hit list whose location is within the boundary of the map will be displayed with the icon centered on the location on the map designated by the *lat* and *lon* fields of the record. This means that the database must have the minimum required map fields (Label, Icon, lat, lon, key – see "make new database").

Related topics linking to a database, displaying points from a database.

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redisplay all

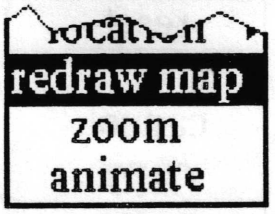


Concept Redisplays all the database generated data points that have been displayed on the map and not removed. This is useful if their display has gotten messed up.

Procedure Select **databases> redisplay all** from the middle mouse button menu.

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redraw map



Concept Redraws the map image from the vector data. Used either to change the size or if the saved image has been messed up.

Procedure Select **redraw map** from the middle mouse button menu.

If the vector data is not available, a confirmer will appear asking you whether it should try to fetch the files from a file server. Whether it will be able to do this depends on the type of machine you are using and the network configuration. Unless you have too little space on your local disk (the vector files can be quite large), answer yes. If it does not know how to look for the files, it will bring up a notifier. Otherwise, you will be prompted to open an interface window to retrieve the files to your machine. When it has finished, return to the map and select **redraw map**, again.

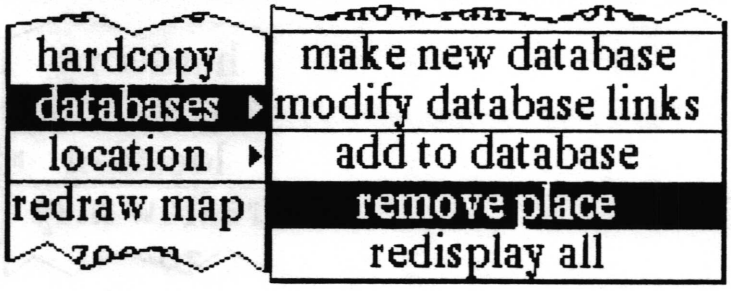
An origin cursor will appear to prompt you to frame the new map size. The new map dimensions will remain proportional to the original map. After framing the new map, click the left mouse button to place the window and then move the cursor inside the editing pane to let the map be drawn.

The drawing may take a long time, depending on the complexity of the map and machine speed. If Analyst is allowed to go into Idle state, the map drawing will be slowed down, but it will not stop.

Effect A new map will be drawn in a new Map Editor window. Any data points that were displayed from a database in the zoomed area on the original map will also be displayed on the new map. After it has finished, the middle button menu option **save** must be used to file the map into an Information Center (unless you do not want it at all). The original map is unaffected.

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remove place



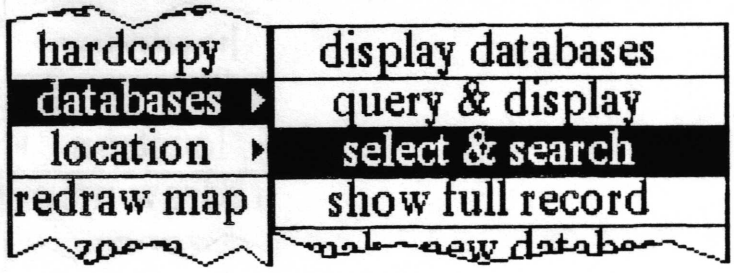
Concept Removes an identified data point from the map.

Procedure Select **databases> remove place** from the middle mouse button menu. Place the resulting crosshair over the point you want removed from the map. Click the left mouse button and the data point will disappear.

Effect The display of the selected data point is removed from the map. It is *not* removed from the database.

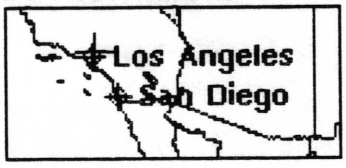
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select & search

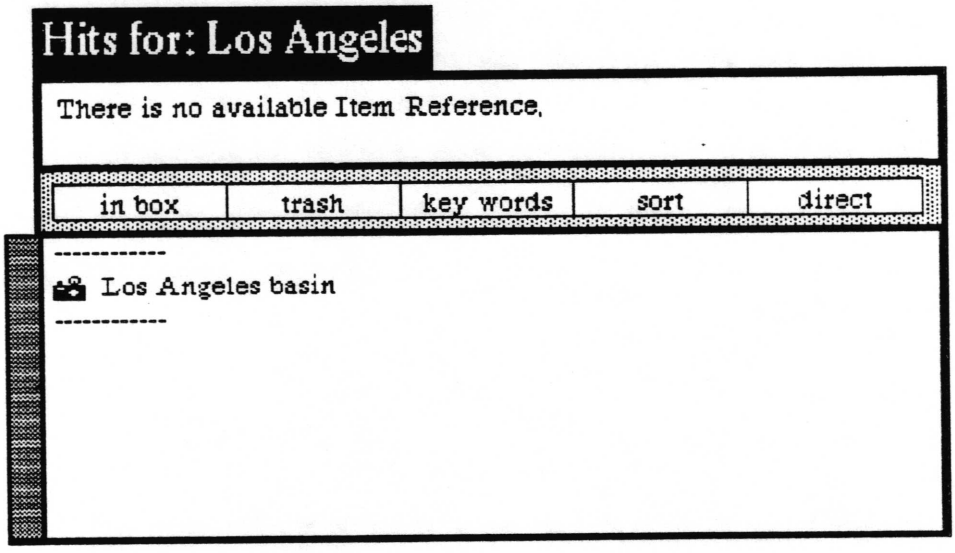


Concept Allows you to search the Information Center for information related to a data point.

Procedure To use this feature you must have a least one data point from a database displayed on the map. Select **databases> select & search** from the middle button menu. The cursor will turn into a crosshair. Place the crosshair over the data point on the map you want to find information about and click the left mouse button.

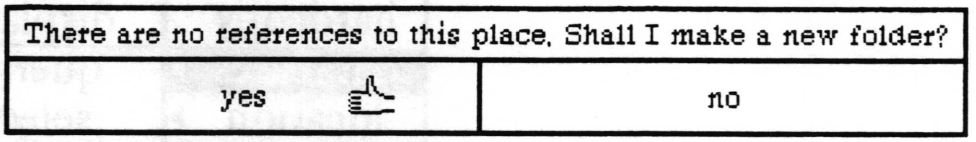


The labels and key words of all the items in the Information Center the map was opened from will be searched for a match with the value of the *key* field of the record corresponding to the selected data point. If the search is successful, an origin cursor will appear to prompt you to frame an Information Center holder window. The holder will contain the matched items.



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If there are no matches in the Information Center for the particular item you have selected, a confirmer will appear.

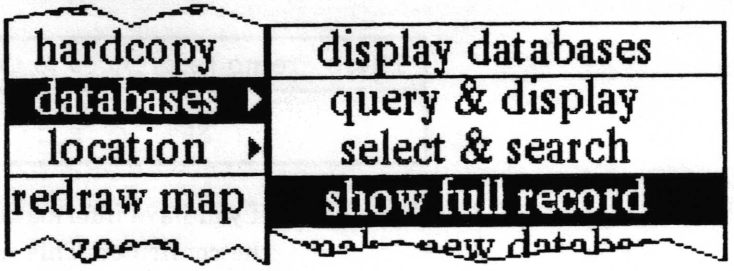


If you have information you want to put in a folder, select *yes* in the confirmer. This will create a folder which will be found the next time you select **databases > select & search**.

Effect Either provides a holder containing all data items found, or allows you to create a new folder in which to put new information.

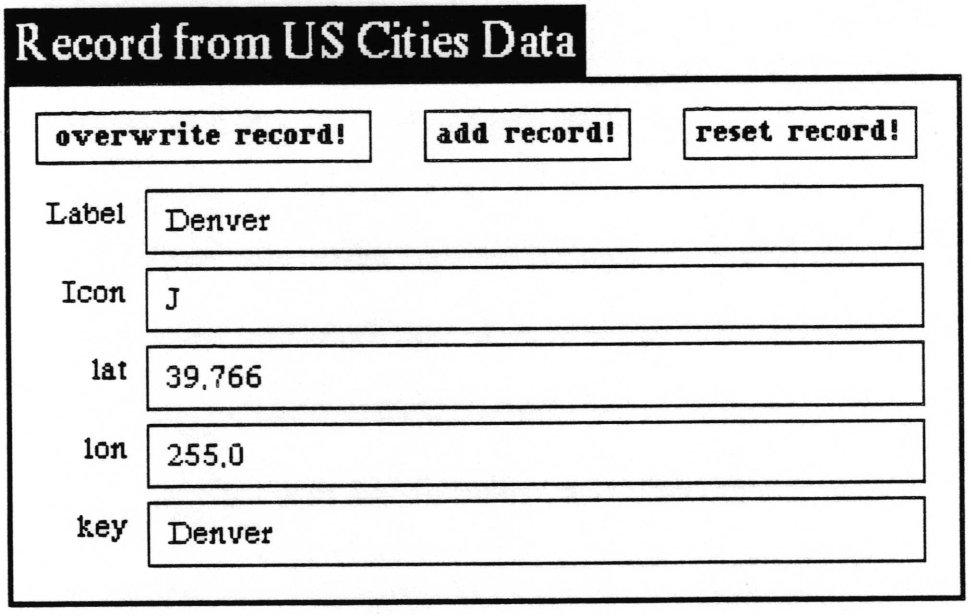
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show full record



Concept Allows you to display all the contents of the database record corresponding to a point selected on the map.

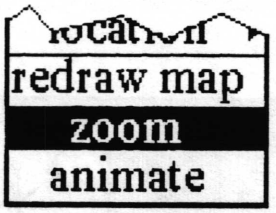
Procedure Select **databases> show full record** from the middle mouse button menu. The cursor will change into a crosshair. Place the crosshair over the icon of the data point on the map and click the left mouse button. An origin cursor will appear to prompt you to frame a database entry form window on the record.



Effect A database record entry form window is opened. It will contain the data for the selected record. The primary purpose of this function is just to display the data. If you wish, however, you may modify the record and select **overwrite record!** to change it in the database (note this will *not* change the map display until you redisplay the records in it). You may also add new records to the same database. For more information about this window, see "form based record entry and editing" in the *Database* chapter of this document.

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zoom



Concept Redraws an area of the map from the vector data at a different scale. This allows you to see more detail and/or to get a subsection of the map drawn at a required size.

Procedure Select **zoom** from the middle mouse button menu.

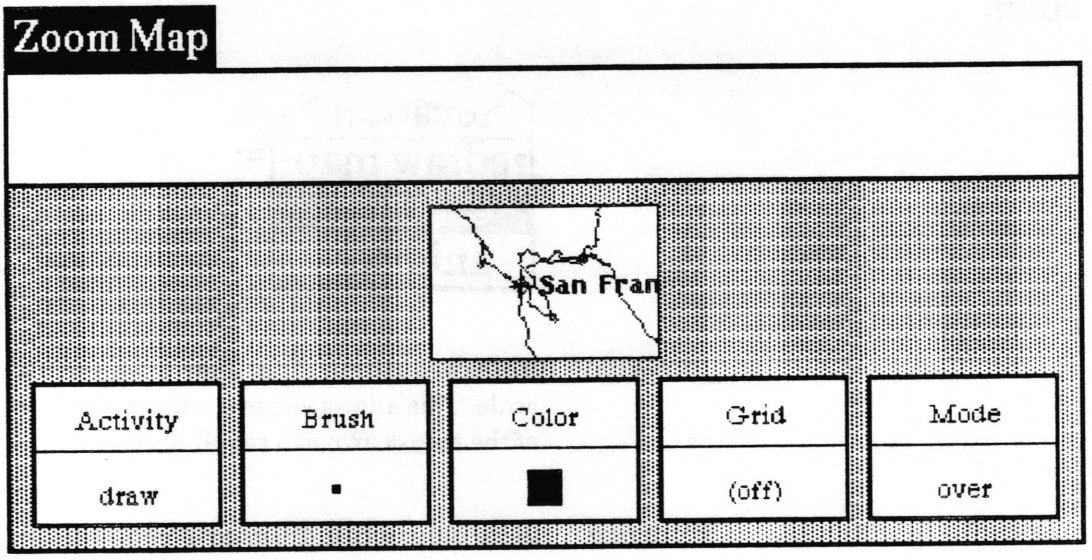
If the vector data is not available, a confirmer will appear asking you whether it should try to fetch the files from a file server. Whether it will be able to do this depends on the type of machine you are using and the network configuration. Unless you have too little space on your local disk (the vector files can be quite large), answer yes. If it does not know how to look for the files, it will bring up a notifier. Otherwise, you will be prompted to open an interface window to retrieve the files to your machine. When it has finished, return to the map and select **zoom map**, again.

If the vector data is available, an origin cursor will appear to prompt you to frame the area of the map you wish to zoom in on. After you have framed the area to zoom, a second origin cursor will appear to prompt you to frame the size of the new zoom map. The dimensions of the new map must be proportional to the area being zoomed, so as you move the cursor to frame the rectangle that proportionality will be maintained. After framing the new map, a third origin cursor will appear for you to designate where to place the new window. Click the left mouse button to place the window and then move the cursor inside the editing pane to let the map be drawn.



The drawing may take a long time, depending on the complexity of the map and machine speed. If Analyst is allowed to go into Idle state, the map drawing will be slowed down, but it will not stop.

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Effect A new map of the selected area will be drawn in a new Map Editor window. Any data points that were displayed from a database in the zoomed area on the original map will also be displayed on the zoom map. After it has finished, the middle button menu option **save** must be used to file the map into an Information Center (unless you do not want it at all). The original map is unaffected.

Right mouse button menu

The right mouse button brings up the standard window popup menu described in the *System Interface* chapter of this document.

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Glossary

animate To display a sequence of positional information on a map, thus simulating motion through time.

annotation A marking or notation placed on the map.

contains link A type of link that links an Information Center folder to the data items and/or folders inside it. The contains links define the hierarchical structure within an Information Center.

data point A map location having a database record of information associated with it.

database An Analyst Database item.

database link A type of link that links a Map to a Database, which the Map Editor follows to find useful databases.

decimal degrees A way of expressing latitude or longitude where the minutes and seconds are expressed as a decimal fraction of a degree. For example, 40 degrees, 30 minutes is 40.5 degrees.

degree A unit of angular measurement. One 360th of the circumference of the globe.

dist/bearing A way of expressing the position of one data point relative to another data point in terms of a distance in nautical miles and a bearing of so many degrees on a compass.

field A portion of a database record. It has a name, length, and data type.

latitude Angular distance on the earth's surface expressed in terms of 0 to 90 degrees north or south of the equator.

lat/lon An x – y coordinate system used to describe the location of a point on a map in terms of degrees latitude and longitude.

lat/lon grid Horizontal and vertical lines drawn on a map with a spacing of a specified number of degrees latitude and longitude.

link Something that specifies a relationship between items in an Information Center.

longitude Distance east or west on the earth's surface as measured from the Greenwich, England prime meridian. Generally expressed in terms of either 0 to 360 degrees east, or 0 to 180 degrees east or west.

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map database A database containing the minimum set of fields required by the various MapEditor database utilization functions. These fields are: *Label*, *Icon*, *lat*, *lon*, *key*, and for animation, *Date*, and *Time*.

minute A unit of angular measurement which is one 60th of a degree.

second A unit of angular measurement which is one 60th of a minute.

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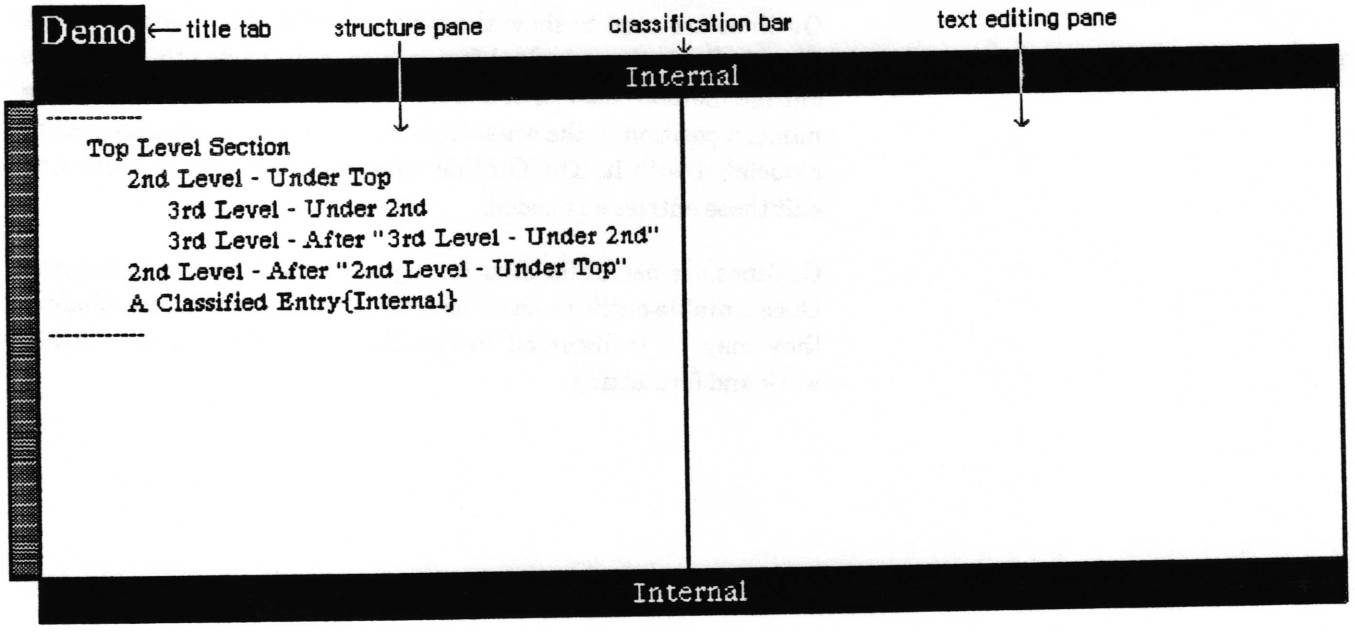
Outline

Outlines are used to show the structure of a report or document. They indicate the principal features or main parts of a topic. The outline method consists of a series of entries, each of which has a name, a position in the organization, and one or more paragraphs associated with it. The Outline window allows you to move and edit these entries as needed.

Outlines are useful for structuring large documents and reports. Once suitable outlines have been built using the Outline window, they may be transferred to the Document System for further work and formatting.

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Outline window layout



title tab

The *title tab* shows the name of the outline displayed in the Outline window.

structure pane

The *structure pane* displays the outline structure. Each entry, with all subordinate subentries, is shown in outline form. Any entry or subentry may be selected to display the corresponding text in the *text editing pane*. The *structure pane* has a middle mouse button menu which enables control of the structure pane contents, and provides access to the *text editing pane*.

text editing pane

The *text editing pane* displays the text from any entry or subentry selected in the *structure pane*. The pane is scrollable. The middle mouse button produces the standard menu used to edit and otherwise manipulate the text.

classification bars

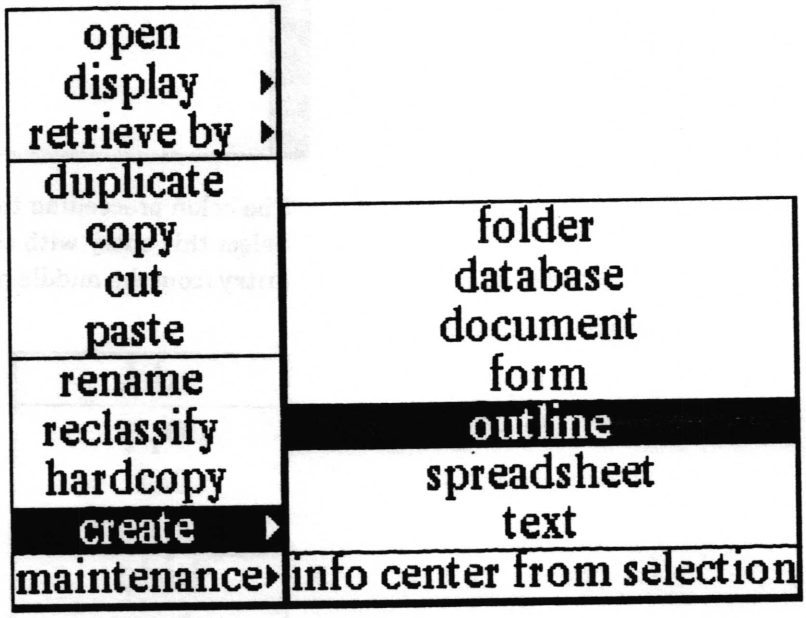
The highest classification level in the outline is indicated by the *classification bars*. These appear at the top and bottom of the Outline window if any entry in the outline is classified. Classification bars for entries which have been cut but not removed from the outline file (by selecting **utilities > compress**) are still included.

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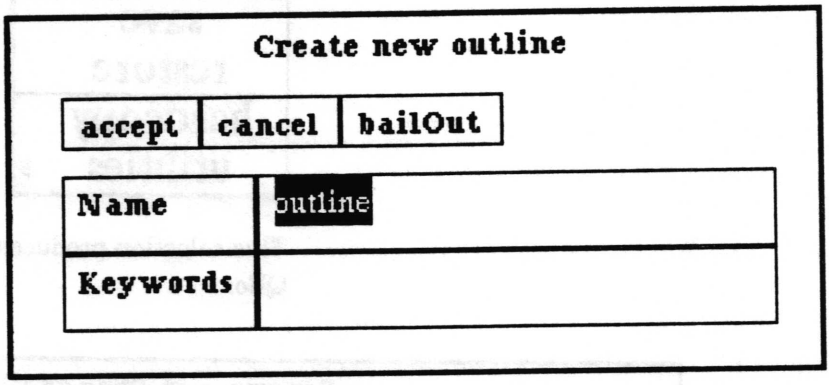
Outline usage

creating an outline

An outline is created by using the **create> outline** option from an Information Center folder middle mouse button popup.



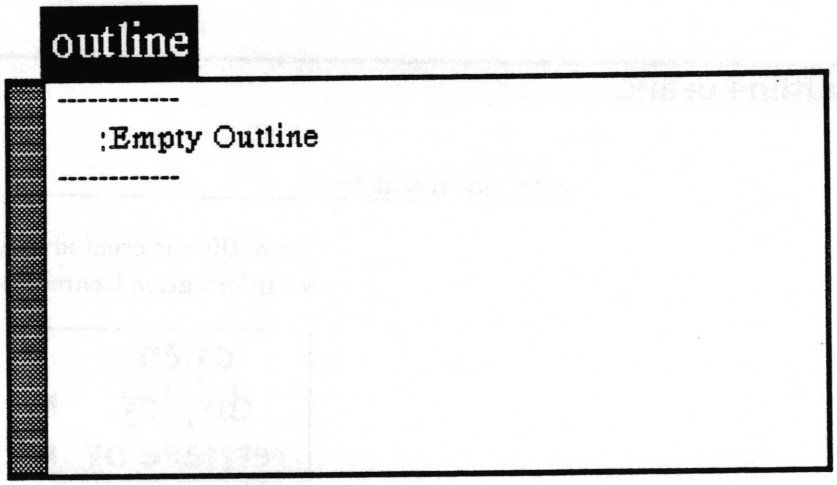
This selection produces a QBox enabling you to create the new outline.



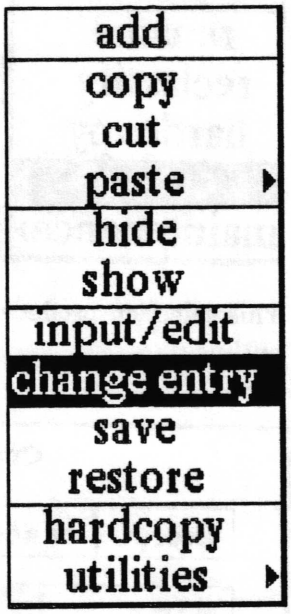
Give the outline a name and indicate any key words which might be helpful in future retrieval, then select **accept**. The outline window can be framed to any size when opened.

Whenever an outline is first opened, it consists of a single pane displaying your topics or entries. A brand new outline window displays the default entry,"Empty Outline" preceded by a colon.

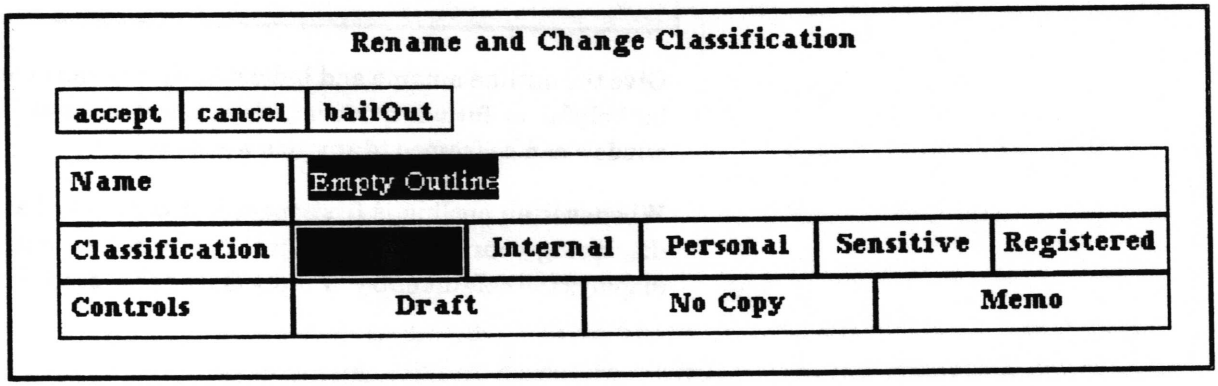
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The colon preceeding the title means the entry has no text in it. Select this entry with the left mouse button, then select **change entry** from the middle mouse button popup menu.



This selection produces a **Rename and Change Classification** QBox.



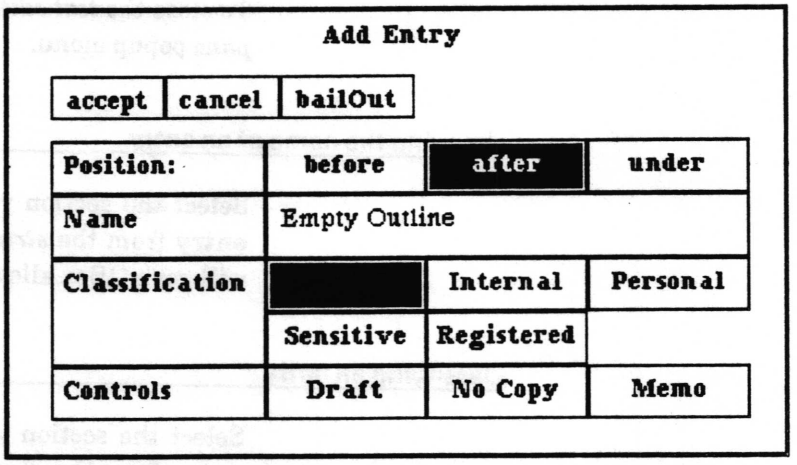
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The default name is always the same as that selected from the folder. In this case, the name shown in the QBox is "Empty Outline." Type your topic name over this name and select any necessary classification, then select **accept**. "Empty Outline" will change to the new name you typed. Entries and text can be added or changed around in any order.

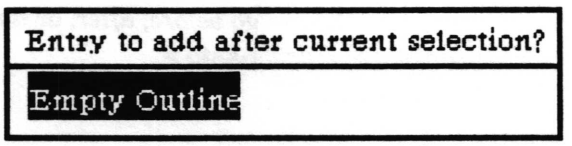
adding a new entry

New outline entries may be added in two ways. Both require that the user select the entry that the new one will go after, under, or before.

Selecting **add** from the *structure pane* middle mouse button menu will give the user the following Qbox. Fill out the **Add Entry** QBox and select accept for the new empty entry to appear in the designated position in the list. *After* will make the new entry be the first entry below the selected entry at the same indentation level as the selected entry. *Under* will make it a subentry of the seleted entry appearing immediately below and indented one level. *Before* will place the new entry above the selected entry at the same indentation level.



You may directly enter new entries without using the menu by first selecting the start entry and then typing a carriage return or a tab. A carriage return will give the fill–in shown below. This will add a new entry to the outline after the selected one. Typing a tab will result in a similar fill–in. It will add an item under (one level below) the selected one. In both cases the new entry will become the selected entry so additional entries can be easily made.



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viewing text of an entry

Select an entry line from the *structure pane*. If the *text editing pane* is not open, select **input/edit** from the *structure pane* middle mouse button menu. The *text editing pane* will open, displaying the text corresponding to the entry selected in the *structure pane*. As you select different entries in the *structure pane*, you will see the text associated with each selection displayed in the *text editing pane*. Selecting **input/edit** for a selection already being viewed will close the *text editing pane*.

entering/editing text in an entry

Select an entry from the *structure pane* and then select **input/edit** from the middle mouse button menu. The adjoining *text editing pane* will open up. It is essentially an editing pane and will display the text belonging to each entry. The pane is scrollable and has a separate popup menu. Type the text directly into the *text editing pane*. When you have finished adding text, select **accept** from the *text editing pane* middle mouse button menu. If you return to the *structure pane* you will see the colon no longer preceeds the entry name.

To close the *text editing pane* select **input/edit** from the *structure pane* popup menu.

changing the name of an entry

Select the section you want to change and then select **change entry** from the *structure pane* middle mouse button menu. You will get a QBox allowing you to change the name.

classifying an entry

Select the section you want to change and then select **change entry** from the *structure pane* middle mouse button menu. You will get a QBox allowing you to change the classification of the entry. You cannot directly set the classification of the entire outline. The outline has the classification of the highest entry in the outline.

moving an entry

Select the entry to be moved, then select **cut** from the *structure pane* middle mouse button menu. Select the entry you want it to go *before*, *after*, or *under*, then select the appropriate option from **paste>**.

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hardcopying the outline

Select **hardcopy** from the *structure pane* middle mouse button menu. If no particular entry is selected, the entire outline will be hardcopied. If an entry is selected, that entry and all entries indented under it will be hardcopied.

For more details, see "hardcopy" in the "Structure pane middle mouse button menu" section of this chapter.

getting the text out of the outline

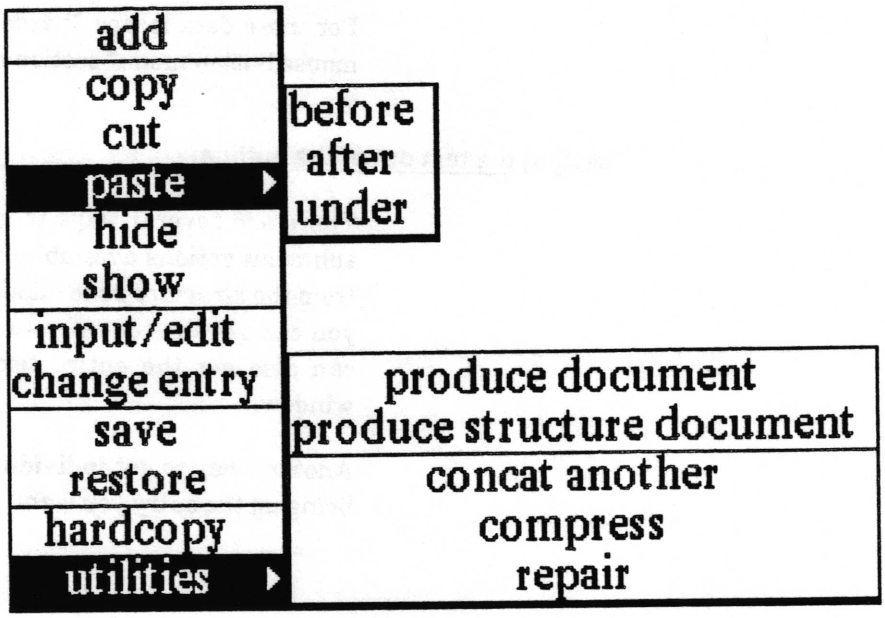
There are several ways to get text out of an outline using the submenu options available in the **utilities> produce...** options from the *structure pane* middle mouse button menu. For example, you can get the text of your outline without any structure. You can also get the entire text out and put it into a Document window.

Another way to get individual selection contents, of course, is to bring up the entry you want, then do a **copy** and **paste**.

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Structure pane middle mouse button menu

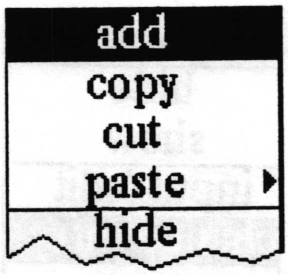
A composite of the structure pane middle mouse button menu is shown below.



The available selections are discussed in alphabetical order on the following pages.

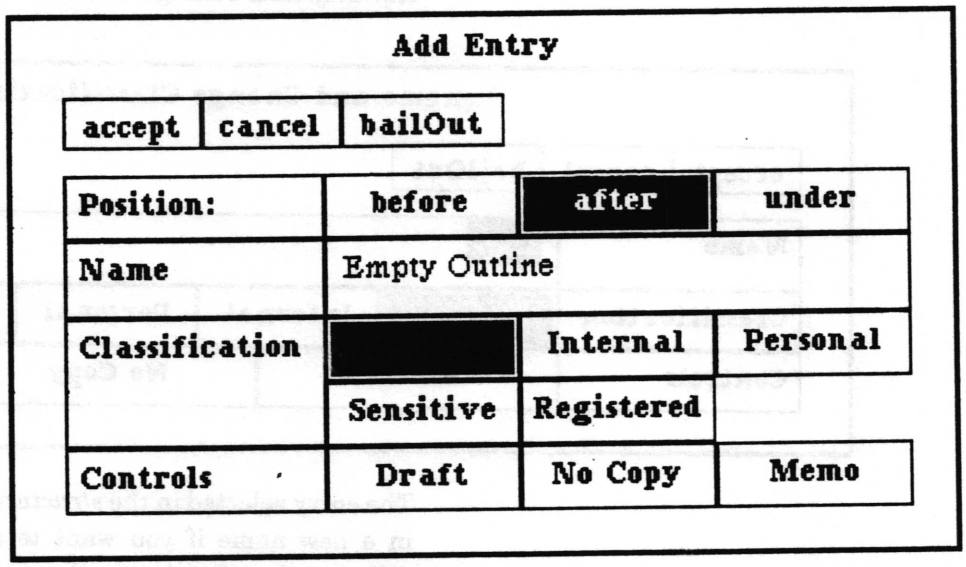
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add



Concept This will add a new entry in the Outline structure pane.

Procedure Select any listed entry, then select **add** from the popup menu. This produces the **Add Entry** QBox.



Type the name of your new entry and select whether this entry will go **before**, **after**, or **under** the entry you just selected from the list. See **paste>** for a description of these three options.

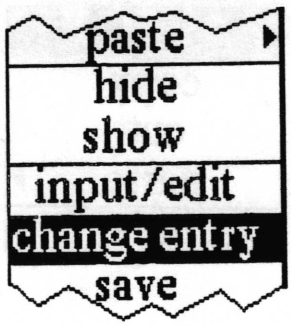
before. Adds the entry in the outline copy buffer right *before* the selected entry on the same level with no indentation.

after. Adds the entry in the outline copy buffer right *after* the selected entry on the same level with no indentation.

under. Adds the entry in the outline copy buffer into the outline as the first entry under the selected entry at the *next level* of indentation.

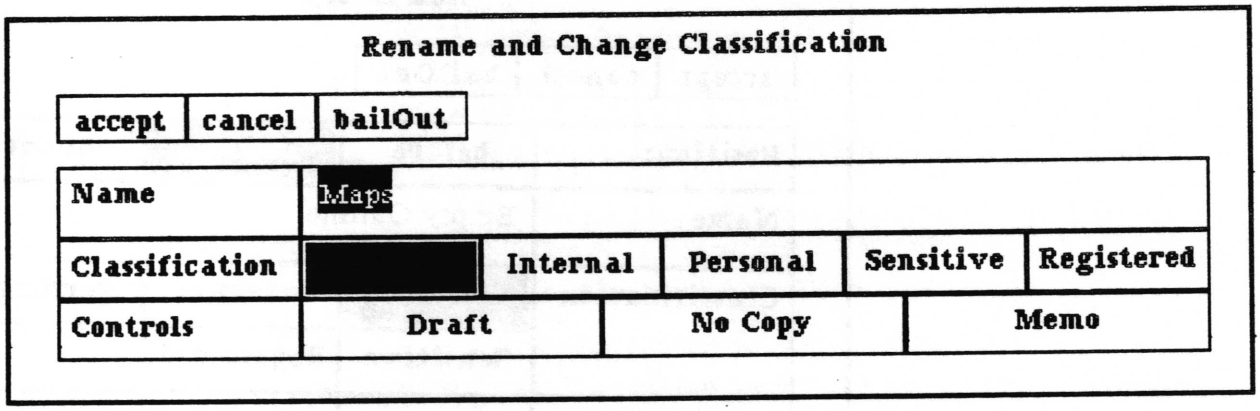
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change entry



Concept Allows you to rename and/or reclassify an entry.

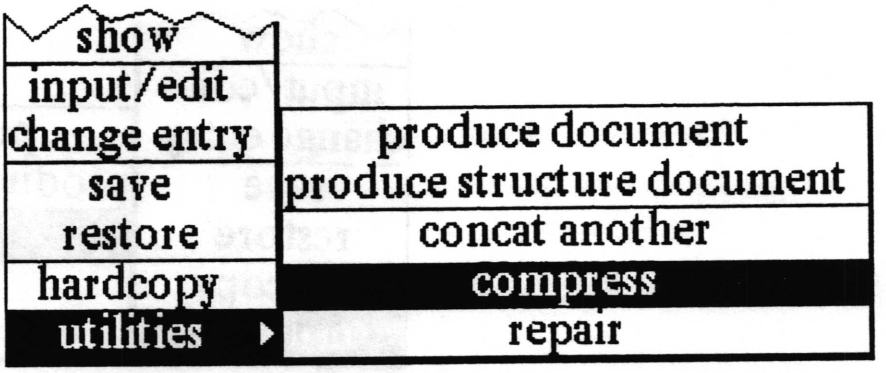
Procedure Select **change entry** from the popup menu. This produces a **Rename and Change Classification** QBox.



The entry selected in the *structure pane* is the default name. Type in a new name if you want to change it. You may also set a different classification for the entry.

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compress



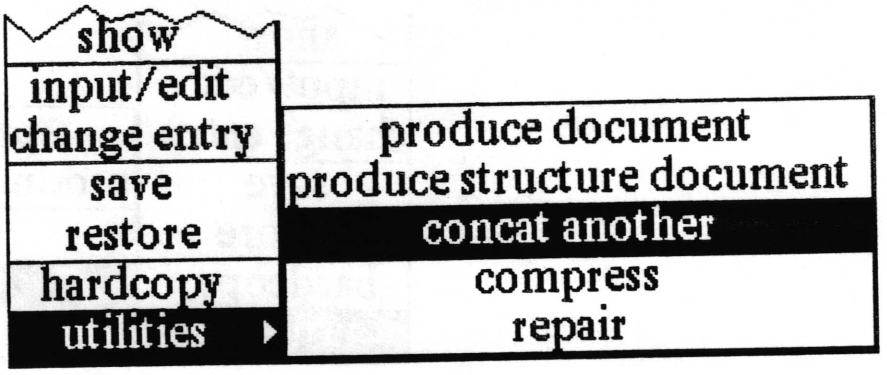
Concept "Cleans up" an outline file after a number of changes or additions have been made to it. Every time changes are made to the text of an outline, they are appended to the end of the outline file. **Compress** will reduce the size of the outline file by removing all overwritten entries.

Procedure Make sure there are no hidden entries in the outline (see **hide** and **show**). Select **utilities > compress** from the popup menu.

Effect Removes old versions of text from the outline file.

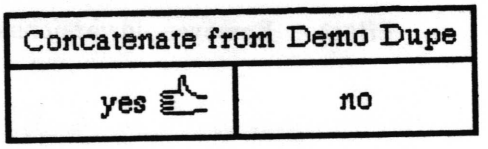
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concat another



Concept Copies the entry structure and text from one outline and places it at the end of another outline .

Procedure To copy the entire contents of another Outline into your outline, copy the other Outline from its Information Center. Return to your Outline window and select **utilities> concat another** from the ***structure pane*** middle button menu. You will get a confirmer as shown below.



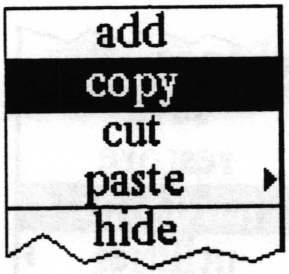
If you select **yes** the entire entry structure and contents of the other Outline will be added after the last entry at the top level in your Outline.

To copy only part of another Outline into your Outline, open the other Outline and select the entry to be copied. Next go to the Information Center folder you opened it from and select **copy**. Now return to your outline and select **utilities> concat another**. You will get the confirmer as shown above. If you select **yes**, the entry that was selected in the other Outline, and all of its subentries and their contents will be added after the last entry at the top level of your Outline.

Once the entries have been concatenated, you may move or delete them as desired.

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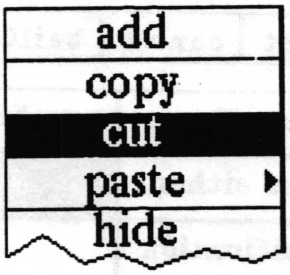
copy



Concept Places a copy of the selected entry into the outline copy buffer, enabling it to be pasted it into another location in the outline.

Procedure Select the entry to copy in the outline structure pane and then select **copy** from the popup menu.

cut



Concept Places the selected entry into the outline copy buffer and removes it from its current position in the outline structure. This allows the entry to be discarded, or moved to another location.

Procedure Select the entry to move or discard, then select **cut** from the popup menu. The selected entry along with any subentries are placed into the outline copy buffer. If you are *moving* the selection to a new location, use **paste>** from the popup to place the selection where you want it.

Effect If it is not pasted elsewhere, the original entry will be deleted.

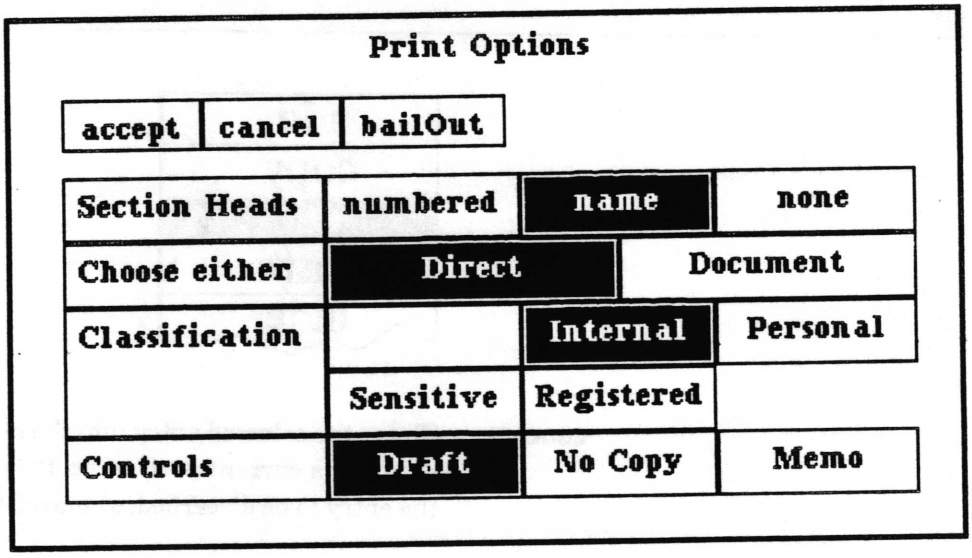
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hardcopy



Concept Makes a hardcopy of all the entries under a selected entry, or of *all* the entries listed in the list pane if no specific entry is selected.

Procedure Select **hardcopy** from the popup menu. This produces the QBox shown below.



If the **Section Heads** field is set to **numbered**, the software will automatically create successively numbered titles for the entries. Each title will be located above its corresponding text paragraph and consists of the assigned number followed by the section head name.

On the other hand, if the **Section Heads** field is set to **name**, a title will be made for every entry consisting only of the section head name. If **none** is selected, it will print the corresponding text of each section without any titles or numbers.

The hardcopy for the entries in a typical Outline window, with section heads numbered, would look like this:

1. The Analyst

The Analyst system has undergone ...

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1.1. Additional Classification Capability

The system has been changed ...

1.1.1 The Classification Schema File

The classification schema used ...

1.1.1.1 A Sample

As a sample case, here is ...

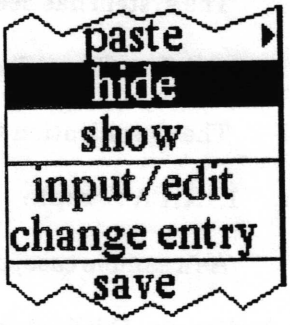
And so on. Outlines will assign a number and print the entry title, even if there is no text associated with it.

In the **Choose either** field of the QBox, **Direct** means that you want to send the file directly to the printer. **Document** means you don't want to hardcopy the file, but instead want to put it into a Document window where you can do additional text editing, merge graphics, and otherwise spruce it up. (See the chapter titled *Document System*.)

Setting **Classification** and **Controls** not only designates what the classification of the hardcopy output will be, it also prevents any entry with a higher classification (and all sublevels of it) from being printed.

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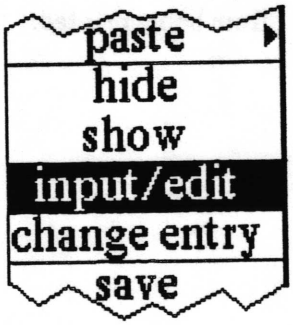
hide



Concept Enables the user to conceal subentries (indented entries) having no immediate interest.

Procedure Select an entry and then select **hide** from the popup menu. A dash will appear to the left of the entry name. If there are no subentries under a selected entry, **hide** will not do anything.

input/edit



Concept Enables the user to view, input, and/or edit text for the entry selected in the *structure pane*.

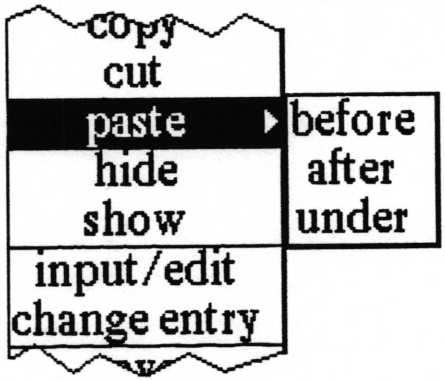
Procedure Select the entry, and then select **input/edit** from the middle mouse button menu. This opens the connected *text editing pane* and displays any text in the selected entry. Add to or edit the text as required. The *text editing pane* has its own popup menu.

When you are finished with that entry, you may either make another selection from the *structure pane* or you may close the *text editing pane*.

Effect Opens and closes the *text editing pane*.

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paste>



Concept Enables the user to place an entry that was copied or cut from the Outline back into the outline structure.

Procedure Select **paste** from the middle mouse button popup menu. In a typical outline, things are organized in terms of entries and subentries. This appears on the screen as an indentation, with all subentries indented farther in than the main entry. The three paste options are used to specify where to paste entries into the outline.

before. Places the entry in the outline copy buffer right *before* the selected entry on the same level with no indentation.

after. Places the entry in the outline copy buffer right *after* the selected entry on the same level with no indentation.

under. Places the entry in the outline copy buffer into the outline as the first entry under the selected entry at the *next level* of indentation.

For example, consider the outline structure below:

Joseph
    Philip
    John
Mary
    Susan

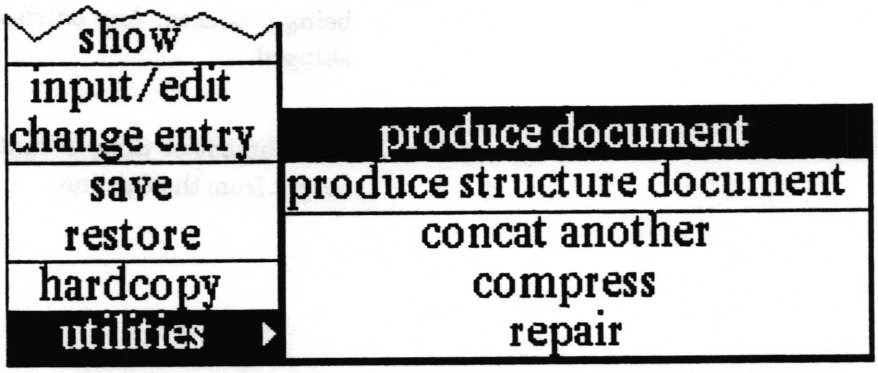
Joseph is *before* Mary, Susan is *under* Mary, and John is *after* Philip. Susan is not under Joseph. John is not before Mary.

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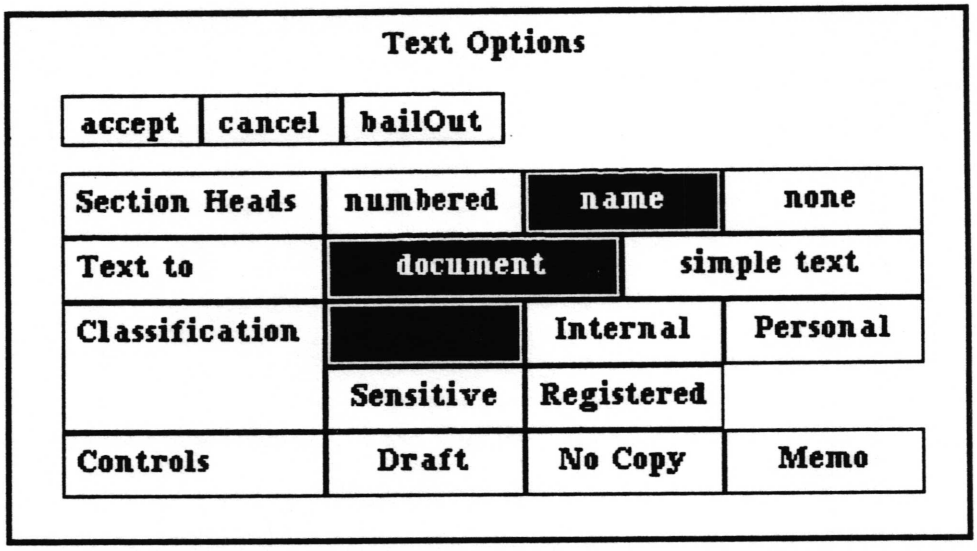
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produce document



Concept Enables the user to collect multiple entries and their contents as a Document or Simple Text item.

Procedure If an entry is selected, only it and any subentries of it will be used. If no entry is selected, the entire outline will be used. Select **utilities> produce document**. The **Text Options** QBox shown will appear.



If the **Section Heads** field is set to **numbered**, successively numbered titles will be created for each entry. Each title will be located above its corresponding text paragraph and consists of the assigned number followed by the section head name. If the field is set to **name**, a title will be made for every entry consisting only of the section head name. If **none** is selected, only the corresponding text of each section will be included, without any titles or numbers.

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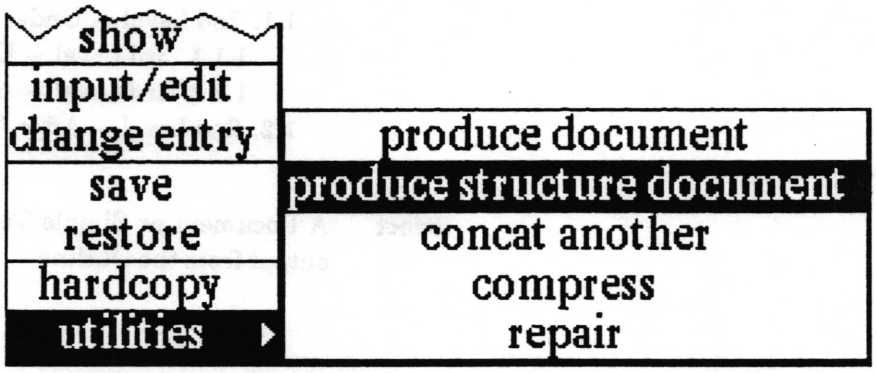
The **Text to** field designates whether output should go to a Document or a Simple Text.

The classification selected will be the classification of the item being produced. Any entries with a higher classification will be skipped.

Effect A Document or Simple Text window will be opened on the text output from the Outline.

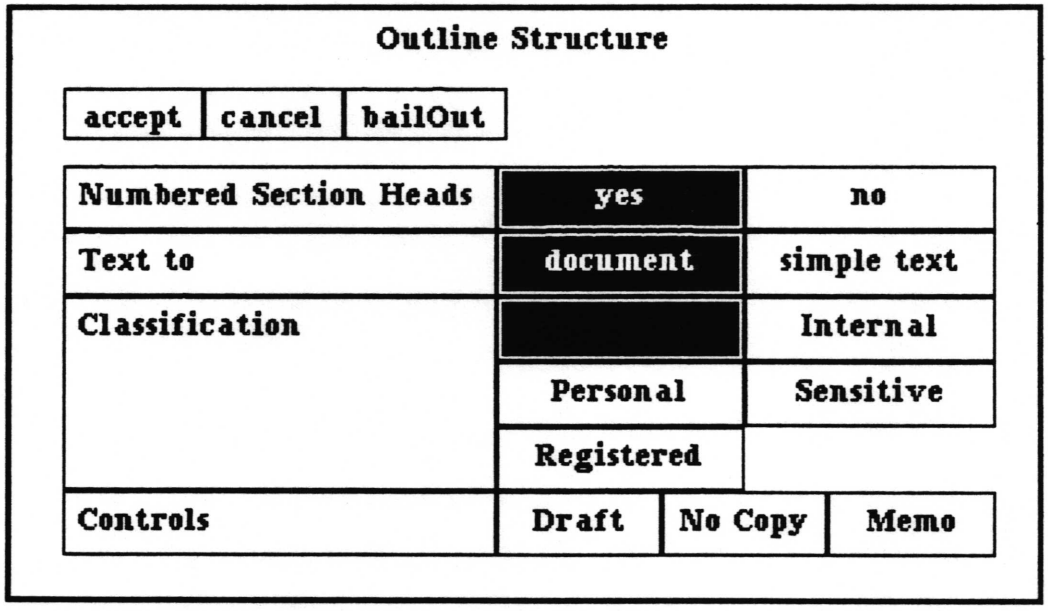
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produce structure document



Concept Enables the user to output the outline entry hierarchy without any of the text contents. This is useful for producing a table of contents. The item produced may be either a Simple Text or a Document.

Procedure If an entry is selected, only it and any subentries of it will be used. If no entry is selected, the entire outline will be used. Select **utilities> produce structure document** from the middle mouse button menu. This produces the **Outline Structure** QBox.



If the **Numbered Section Heads** field is set to **yes**, successive numbers will be added to the name of each section. Otherwise, just the section head name will be included. The **Text to** field designates whether output should go to a Document or a Simple Text. The classification selected will be the classification of the

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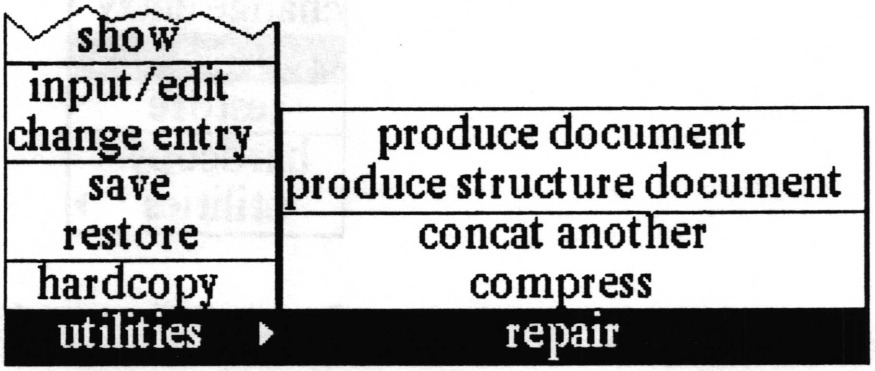
item being produced. Any entries with a higher classification will be skipped.

1. Top Level Section
   1.1. 2nd Level – Under Top
      1.1.1. 3rd Level – Under 2nd
      1.1.2. 3rd Level – After "3rd Level – Under 2nd"
   1.2. 2nd Level – After "2nd Level – Under Top"

Effect A Document or Simple Text window will be opened on the text output from the Outline

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repair



Concept Attempts to fix or recover a broken outline file.

Procedure Select **utilities > repair** from the middle mouse button menu.

Effect The system attempts to match each outline entry with corresponding text, and a log is made of problem text entries. If you are satisfied with the repair you can save the outline.

restore



Concept Erases all changes since the last save by reading in the outline again from the saved file.

Procedure Select **restore** from the middle mouse button menu.

Effect Restores the Outline to the most recently saved state.

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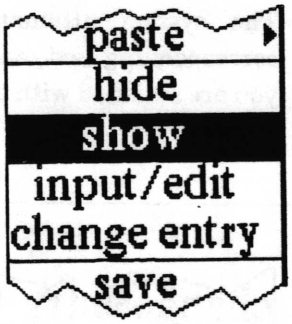
save



Concept Saves the Outline entry structure and text to the disk. Updates the Outline data item in the Information Center.

Procedure Select **save** from the middle mouse button popup menu.

show



Concept Enables the user to see entries that were hidden from view by **hide**. Where hidden subentries occur, a dash appears in front of the entry in the list.

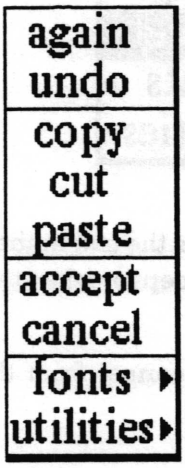
Procedure Select an entry in the *structure pane*. Select **show** from the middle mouse button popup menu. Any subentries of the selected entry will be displayed.

Effect Displays hidden subentries.

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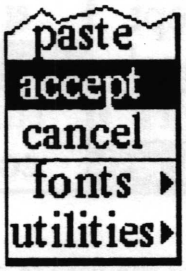
Text editing pane middle mouse button menu

The text editing pane middle mouse button menu is shown below.



This text pane is similar to a Simple Text window. All selections except **spawn** (found under the **utilities>** selection), **accept** and **cancel**, are as described in *Simple Text* and will not be repeated here.

accept



Concept Saves the text in the *text editing pane* for the selected entry.

Procedure Select **accept** from the *text editing pane* middle mouse button menu. This saves the text of the entry so it will not be lost if you select another entry.

Note: The text is not saved on the disk until you select **save** from the *structure pane* menu.

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cancel

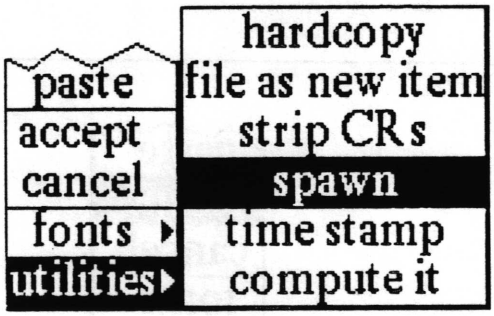


Concept Returns the text in the *text editing pane* back to what it was at the last **accept** or when the entry was selected.

Procedure Select **cancel** from the *text editing pane* middle mouse button menu.

Effect Erases all editing changes made since the last **accept**.

spawn



Concept Enables the user to generate a copy of the text entry currently displayed in the *text editing pane* for easy reference and manipulation. Changes in the spawned window will not be reflected in the outline.

Procedure Select **utilities > spawn** from the middle button menu in the *text editing pane*. Frame the window with the origin cursor. The contents of the text editing pane are displayed in the window. This text may then be modified, copied and pasted elsewhere if you wish.

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Right mouse button menu

The right mouse button brings up the standard window menu fully described in the *System Interface* section of this document.

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Glossary

after A term describing a relative position in an outline structure. The first entry below another entry at the same indentation level as that entry.

before A term describing a relative position in an outline structure. An entry above another entry at the same indentation level.

compress To remove old versions of text from an Outline file.

concatenate Append.

copy buffer A copy buffer used within an Outline the same way the clipboard is used by most other tools.

entry A data item having a name, a position in the Outline structure, and usually, one or more paragraphs associated with it.

hide To conceal a subentry.

numbered In producing text or printing, a choice of *numbered* in the QBox causes a sequential number to be added to the title for each outline entry.

spawn To generate a copy of text displayed in the text editing pane.

structure Principle features or main parts of an outline. The list of outline entries.

structure pane Outline window pane which displays the structure of the outline.

structure text The outline entry hierarchy without any textual content.

subentry An entry indented in from the entry above it.

text editing pane Outline window pane which displays the text of an entry or subentry selected in the structure pane.

under A term describing a relative position in an outline structure. A subentry of an entry appearing immediately below and indented one level.

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Simple Text

Introduction

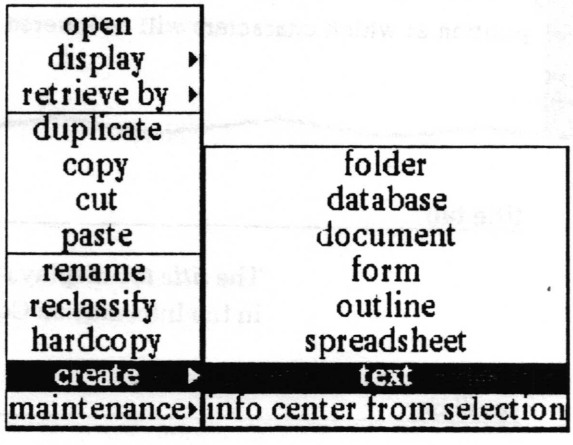
Simple text windows are for writing and editing text. This is done with the keyboard and with menu commands displayed on the screen. The menus are enabled by pressing the mouse buttons. All text entry and editing appears on the screen within a framed area called a *text item window*. Within the text window your words may be entered, edited and formatted using commands available from the middle mouse button menu which "pops up" on the screen when that mouse button is pressed. Text may be typed into an existing text item, the Scratch Pad, or a newly created text window.

The text can also be annotated. After creating the annotation notes, they can be displayed in a separate window, or expanded so that they appear in the text item window. Annotations can optionally be hardcopied with the main body of the text.

Creating a text item

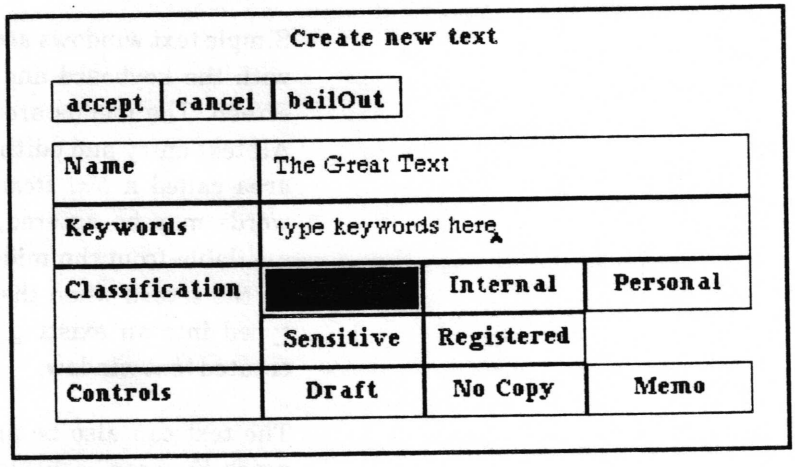
Creating a text item and window

You create a new text item by pressing the middle mouse button in any Information Center folder and selecting **create>text** from the middle button menu.



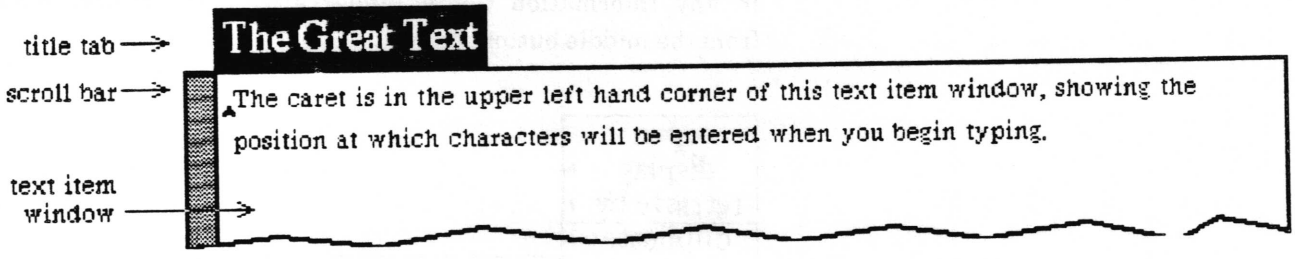
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Selecting this function produces a **Create new text** QBox. Type in the desired item title after **Name**, and insert any **keywords** you may want for the resulting item. The **classification** and **controls** choices have been set by your system administrator, and may be selected as appropriate.



After selecting **accept**, the new text item name is placed into the Information Center folder from which it was created. The new text window is then opened for you and this icon appears in the Information Center.

Simple text window layout



title tab

The *title tab* displays the name of the Simple Text item as entered in the Information Center.

scroll bar

The *scroll bar* allows you to rapidly move through text. It is represented by a narrow rectangular area displayed to the left side of the window that it controls. The scroll bar will disappear when the cursor is not in the window.

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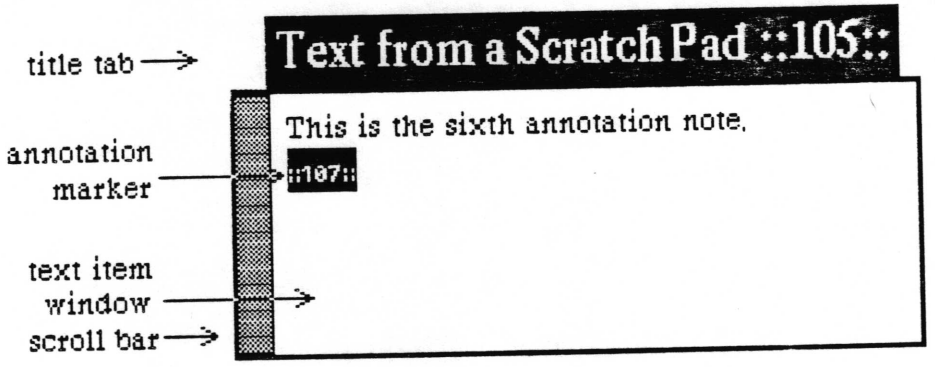
text item window

The *text item window* is ready for user input when you want to create or edit text. The window can be shaped by the user; the default size is approximately 6 inches wide by 6 1/2 inches high. The middle mouse button provides additional commands which are useful for editing, annotating, saving and printing the text item.

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Annotation window layout

The annotation window is similar to the text item window. The annotation window shown here has some text entered in the first line, and a selected annotation marker in the second line.



title tab

The *title tab* displays the name of the text item as entered in the Information Center, followed by the annotation marker (::105:: for example). This unique number for each annotation within a text item is automatically assigned by the Analyst, beginning with 100.

scroll bar

The *scroll bar* allows you to rapidly move through text. It is represented by a narrow rectangular area displayed to the left side of the window that it controls. The scroll bar will disappear when the cursor is not in the window.

text item window

The *text item window* is ready for user input when you want to create or edit text. The window can be shaped by the user; the minimum size is approximately 3 inches wide by 1 inch high. The middle mouse button has fewer options than the text item window, but sufficient for text editing, annotation, and saving.

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Using the text item window

Opening an existing text item

When you open an existing text item, an Origin cursor prompts you to position the text item window. The name of the selected item is in the title tab above the window. The caret is in the upper left corner of the text window.

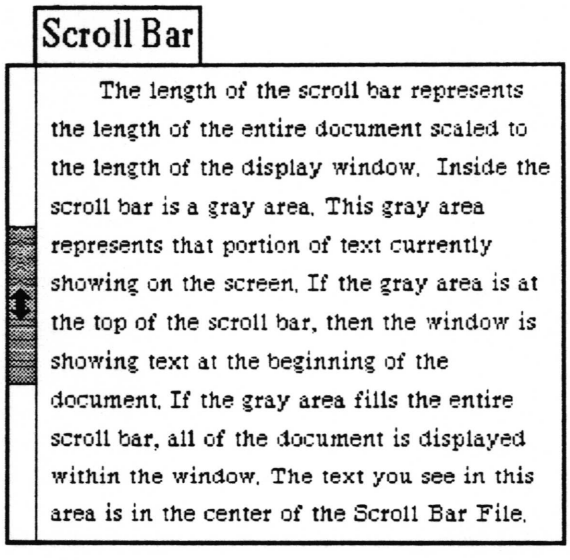
Place the cursor at the point where you want the new text to begin and click the left mouse button. The caret will appear and you can begin typing. Characters are inserted at the location of the caret.

Opening a scratch pad

The Scratch Pad (see the *System Interface* section of this manual) also uses the Simple Text editing and menu procedures described in this section.

Using the scroll bar

The scroll bar allows you to rapidly move through text. It is represented by a narrow rectangular area displayed vertically to the left side of the text item window that it controls. The scroll bar will disappear when the cursor is not in the window.



When the cursor is within the scroll bar area, it looks like an arrow that points up and down. Scrolling moves the text that is adjacent to the arrow.

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Clicking the mouse button produces a different scrolling effect than holding the mouse button. When you move the cursor within the scroll bar and click the left mouse button, the text dislayed in the window will recompose with the line of text which was *adjacent to the arrow* starting at the top of the page.

When you hold the left mouse button down, the cursor turns into an Up Arrow and the text moves from the bottom up as the gray area moves downward. If you hold the right mouse button down while the arrow is in the scroll bar, it turns into a Down Arrow and the window text moves from the top down as the gray area moves upward.

A more rapid way to scroll through text, or move to the beginning or end of the text, is like thumbing to a section of a book. When you move into the scroll bar and press the middle mouse button, the Marker cursor indicates the relative position of the text in the window to the entire text item. Move the gray area up and down. When you release the button the displayed text will correspond to the relative position of the gray area within the scroll bar.

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Selecting and editing text

Editing text is done by selecting the characters to be changed and then performing the change. Changes can be made by typing over the old characters, deleting them entirely, or by moving them elsewhere in the text item. Many editing changes can be accomplished by using the middle mouse button menu items described later on in this document. Text must first be *selected* before it can be edited.

Selected characters are displayed in reverse video, that is white text on a black background.

This is called highlighting.

Text is selected with the left mouse button by either a *double click*, or a *draw through*.

Double Click

Click the left mouse button to place the caret at the location of the cursor. If you click the left mouse button again with the cursor in the same location (double click), you will either select a word, a paragraph, or the entire document, depending on where the caret is placed.

To select a *single word*, place the caret at the space before, after, or anywhere within the word, and click the left mouse button again.

To select a *single paragraph* (defined as text between carriage returns), place the caret before the first character or just after the last character in the paragraph and click the left mouse button again. The full paragraph will still be selected even if it is not completely visible on the screen.

To select the *entire document*, place the caret in front of the first character or after the very last character in the document, then click the mouse button again.

Draw Through

Move the cursor to the beginning or end of the text you want to select. Press and hold the left mouse button down, placing the caret at that location. Continue holding the mouse button down and draw the cursor through the desired text. As the cursor is moved, the text being selected is displayed in reverse video. Selections can be made forward or backward from the starting

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point. Release the left button when everything you want to select is displayed in reverse video.

If all of the text you want to select is not visible in the window, select the start point and continue to hold down the mouse button while moving the cursor below the window (or above, if selecting backwards). This makes the text scroll automatically *while it is being selected.* The rate of scroll is controlled by how far above or below the window the cursor is; the farther outside the window, the faster it will scroll. Once the end point becomes visible, moving the cursor back into the window will terminate the scrolling. Place the caret at the point you wish and release the mouse button.

Extending any selection

Any currently highlighted selection that doesn't cover as much text as you would like may be extended from either end by holding down the left shift key, moving the cursor to the new location and clicking the left mouse button. The highlighting will be extended to cover the additional characters up to the position of the caret.

Special keys and key combinations

In addition to using the alphanumeric keys to enter text, some of the non–displaying keys on the keyboard can be used for editing text.

Backspace

Pressing the backspace key will delete the current selection and the character preceding it.

Delete

The current selection will be deleted if the DEL key is pressed. On some workstation types, the delete key will do a backspace when the current selection is empty.

Escape

Pressing the ESC key will cause the implicit selection to become explicitly selected. When typing text, there is an implicit (not visible to the user) selection of all the text typed since the last explicit (made with the mouse) selection.

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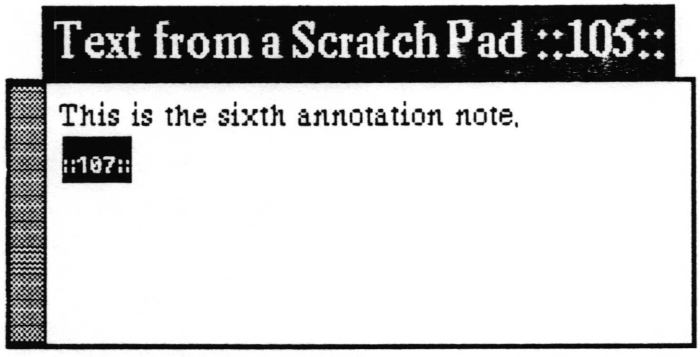
Left shift

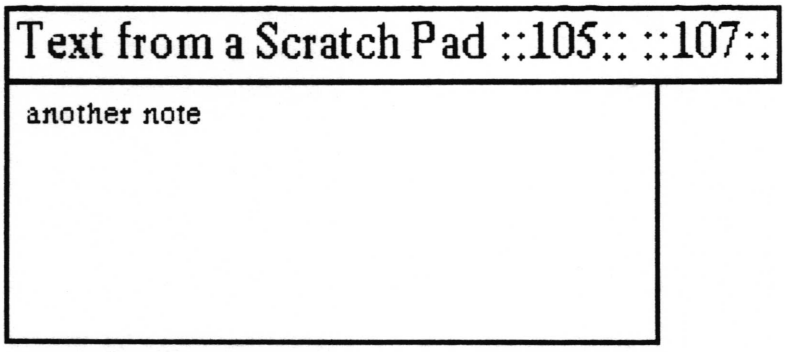
The shift key on the left side of the keyboard is often used for special purposes. For example a text selection can be extended by pressing the left shift key down, moving the cursor to the new selection end point then pressing and releasing the left mouse button.

Annotations

Annotations are created by positioning the caret where the annotation is to appear, or by selecting the text which is to become an annotation and selecting **annotation>create** from the middle mouse button menu. Once the annotation marker is inserted into the body of the text, it can be viewed in its own window by selecting **annotation>display** from the menu. If you wish to remove the annotation marker and return the text to the main body, select the marker and select **annotation>expand**. Please refer to the *Simple Text window middle mouse button menu* section of this document for detailed procedures.

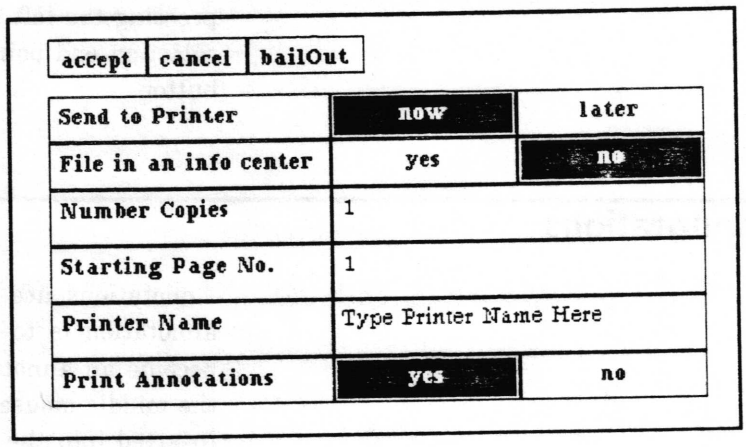
Annotation notes can contain annotations. The windows below show the display of annotation 105, and below it, note 107 which was contained in annotation 105.





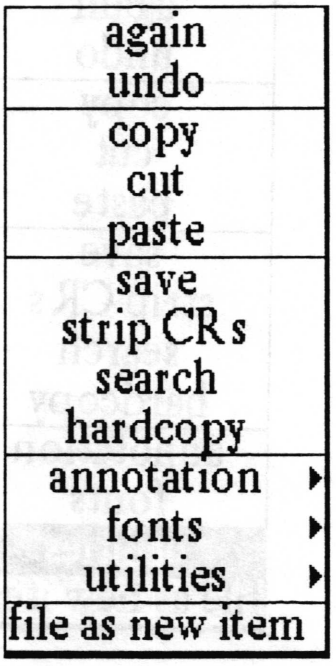
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Annotations can optionally be hardcopied along with the main body of the text by responding **yes** to the **Print Annotations** field of the Hardcoy QBox.



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Simple Text window middle mouse button menu

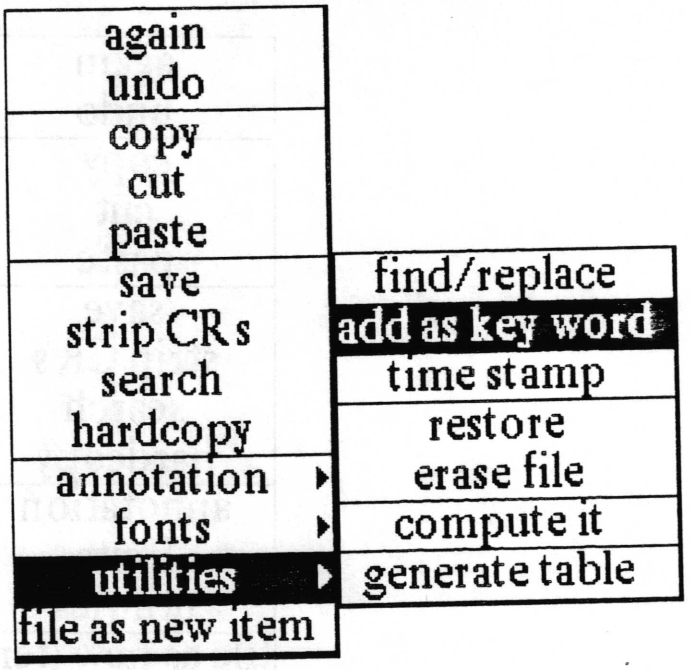


When the cursor is located anywhere within the Simple Text window this middle mouse button menu is available.

Following in alphabetical order is a detailed description of each of the functions available in this menu. When the annotation text window has the same middle mouse button item available, it is illustrated to the right of the Simple Text window's menu.

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add as keyword



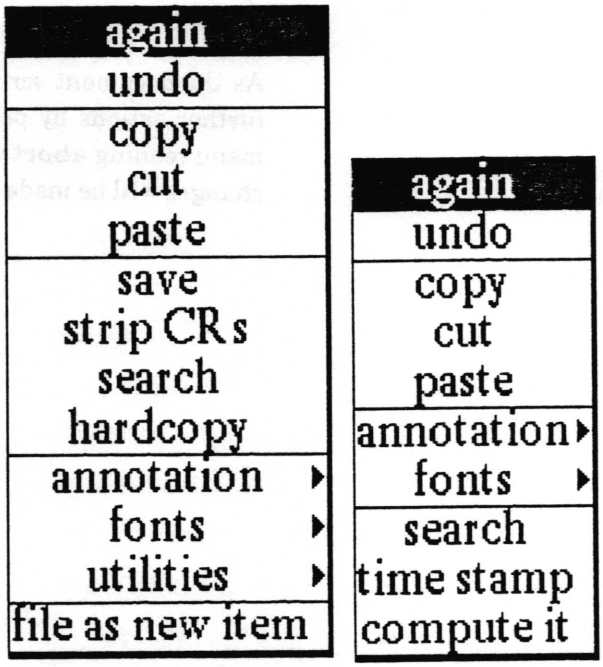
Concept Allows you to add text from the Simple Text window as a new keyword for the text item in its Information Center.

Procedure Select the desired text and select **utilities > add as key word**. If the text window is a Scratch Pad, you will receive a Notifier saying "Cannot make keyword because this item is not filed. Click mouse to continue." (You may then select **file as new item** to save the Scratch Pad's contents as a Simple Text item. When you open the newly created Simple Text item, you will be able to use **add as key word**.

Effect The selected text is added to the list of key words used by the Information Center. Storing phrases as key words is allowed; key words are stored as lowercase characters only. For example, if you select a phrase, such as "Simple Text Item" to be added as a key word, it will be added as "simple text item."

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again



Concept **Again** is used to search for and find the next occurrence of a piece of text or to find and replace the next occurrence. What it will do depends on what the last text operation was.

Procedure After putting something in the clipboard by performing a **copy** or **cut** or **paste**, check the current text selection before selecting **again**. **Again** starts looking from the end of whatever the *current* text selection is.

The **again** function can be selected repeatedly from the menu, or it can be set up to repeat automatically by holding down the left–shift key while selecting **again** one time from the menu.

Effect If the last text operation was a **copy** or **cut**, selection of **again** will cause the system to look for the next occurrence of the text that was copied or cut. When found, that occurrence will be made the next selection (highlighted).

Use of **again** after replacing a piece of text will cause it to look for and find the next occurrence of the replaced text, and replace it in the same way.

If the last text operation was a **paste**, or typing over existing text or a change of font through use of the **font>** menu choice, selecting **again** will cause the system to look for the next occurrence of the text that was changed. When another occurrence is found, it will be changed in the same way as the last occurrence, and made the current text selection.

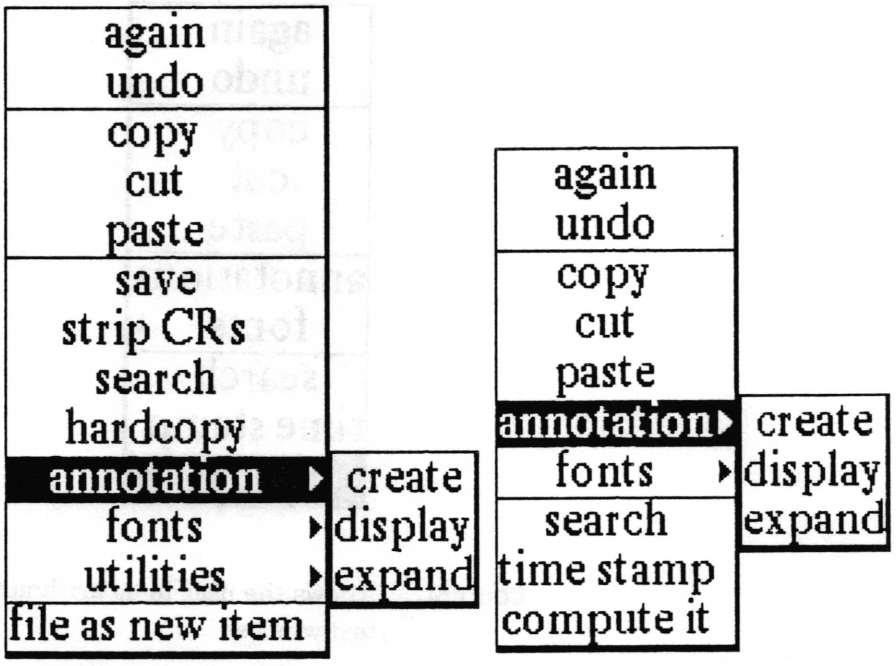
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When **again** finds multiple occurrences, the window will be scrolled if necessary so that the new selection will be visible. When another occurrence is not found, the window will flash in reverse video.

As the document scrolls during automatic **again**, you can abort further actions by pressing the middle mouse button. A popup menu reading **abort** will appear. Select it and no further editing changes will be made by **again**.

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annotation>



Concept Enables you to place notes in text or within other notes. Annotations can be copied and pasted elsewhere in the text as well.

Procedure The **annotation>** submenu allows you to **create**, **display**, and **expand** annotations. See separate entries in alphabetical order for each of these menu items.

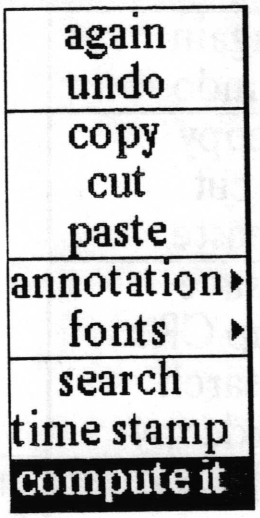
To copy the contents of an annotation into another text location, select the annotation marker and then do a **copy**. Move the caret to where you want the annotation located and do a **paste**.

Effect The position of the annotation text is indicated by the annotation marker: ::100::, a number enclosed within double colons. Markers begin with 100 and increment by one each time they are created. Annotations which have been copied from elsewhere get a unique number.

When making a hardcopy of text containing annotations, the hardcopy QBox allows for the printing of the annotations. Selecting **yes** enables the annotation reference number to be printed in the text, with a table of the annotations printed at the end of the text. Selecting **no** prevents the annotation reference numbers and their associated text from being printed.

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compute it



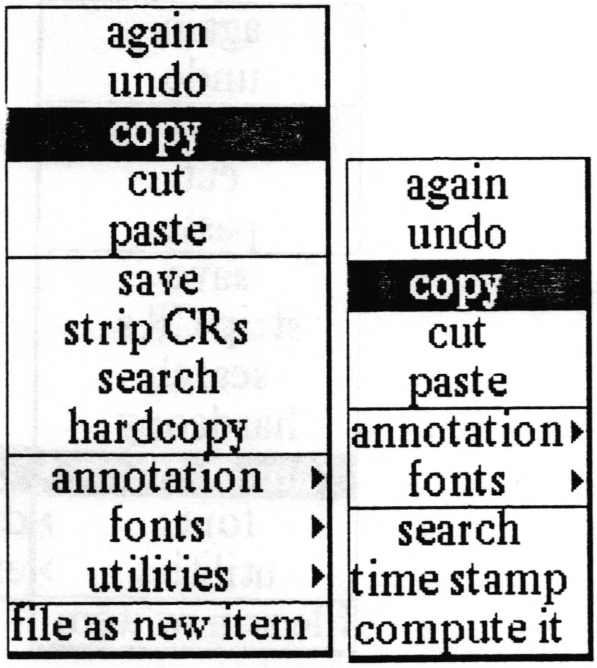
Concept Allows the user to do arithmetic functions on expressions in the text window.

Procedure In either the text item or annotation window, select an arithmetic expression, "2 + 3" for example, and select **utilities>compute it.**

Effect Prints the answer, "5" for example, in the text item window, or in the annotation window.

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copy



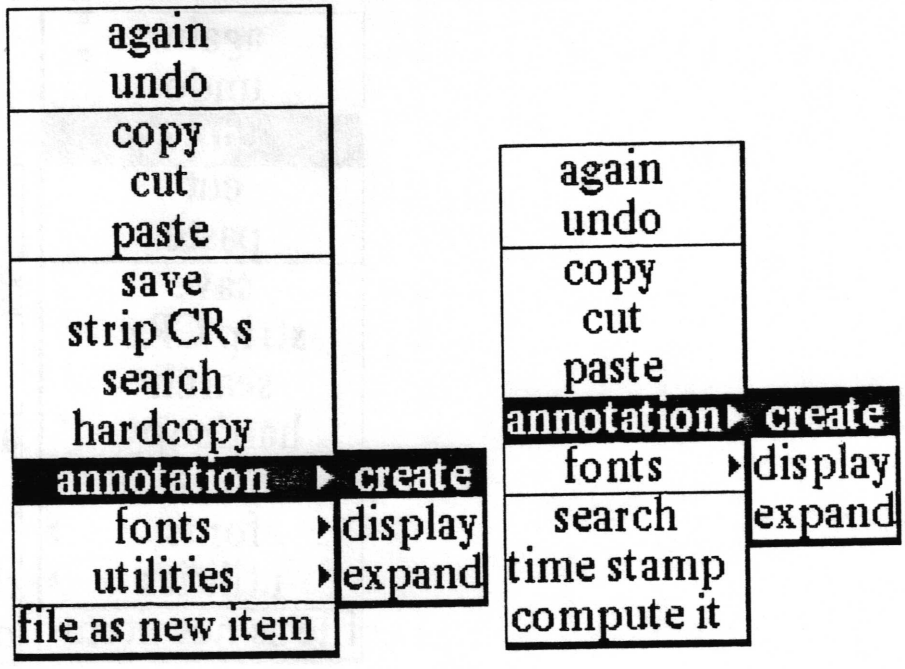
Concept Puts a copy of the current selection into the clipboard.

Procedure In either the text item or annotation window, select desired text and select **copy**.

Effect Once text is copied into the clipboard it can be placed anywhere in the text (see **paste**), or **again** can be used to find other occurrences of it.

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create



Concept Enables you to make an annotation or note within text or within other annotations.

Procedure You can use two procedures to create an original annotation.

The first is to position the caret at the location where you want the annotation marker. and type the text of your note. Then select all of the text for the note. Select **annotation > create**.

The second is to position the caret at the location where you want the annotation and select **annotation > create**. While the marker is still highlighted, select **annotation > display**. The annotation window will open, ready for editng. Closing the window saves the annotation temporarily (until the Simple Text item itself is saved, or restored to a previous state.)

To copy the contents of one annotation to another location, select the annotation marker and then do a **copy**. Move the caret to where you want the annotation located and do a **paste**.

Effect The text of the annotation will be replaced by the annotation marker ::100::. The marker is a pair of double colons enclosing a number beginning with 100 and incremented by one each time they are created.

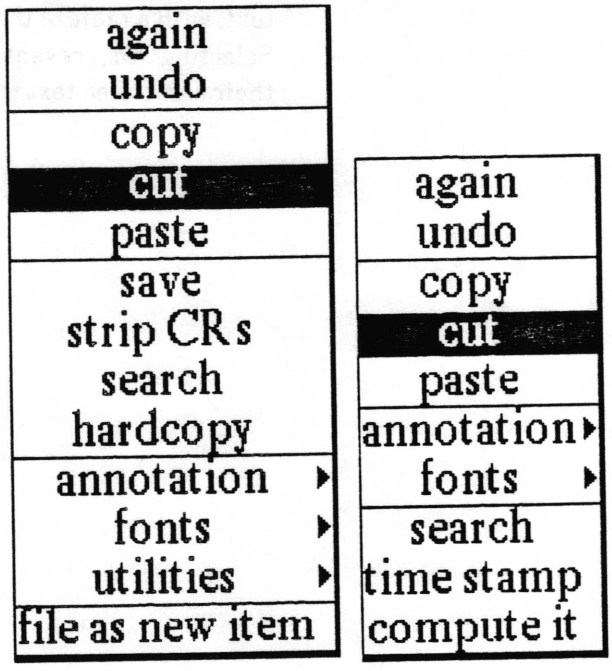
When annotations are copied and pasted, a new annotation number is assigned to the pasted copy of the original.

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When making a hardcopy of text containing annotations, the QBox allows for the printing of the annotations. Selecting **yes** enables the annotation reference number to be printed in the text, with a table of the annotations printed at the end of the text. Selecting **no** prevents the annotation reference numbers and their associated text from being printed.

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cut



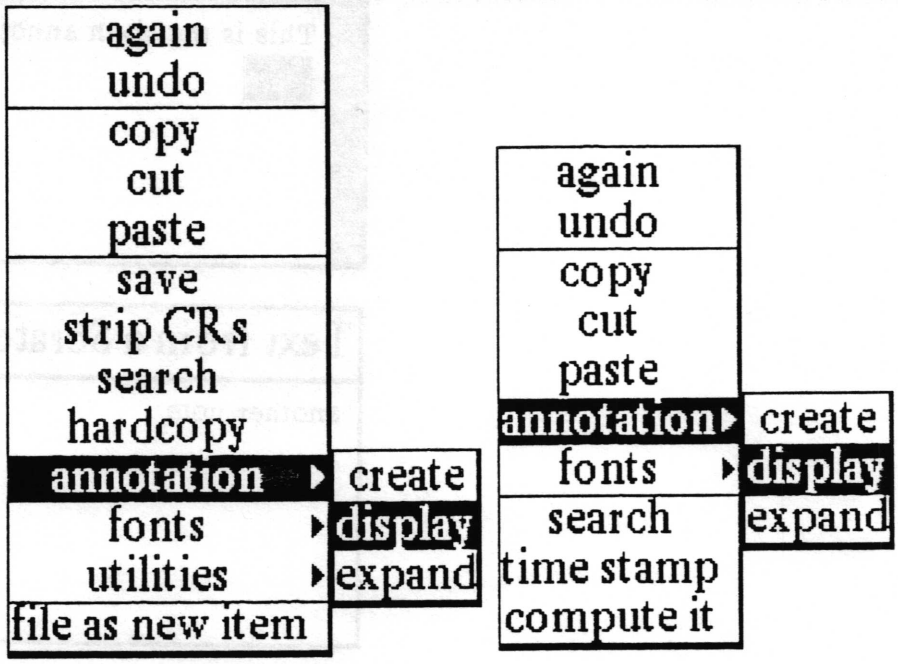
Concept Allows you to delete the current selection and place it into the clipboard.

Procedure In either the text item or annotation window, select the text to be deleted and select **cut**.

Effect If the next operation is a **paste**, the cut text will be inserted at the caret location. If the next operation is **undo**, the text will be reinserted. Using **cut** and then **again** will find the next occurrence of the selected text and cut it. This process can be repeated.

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display



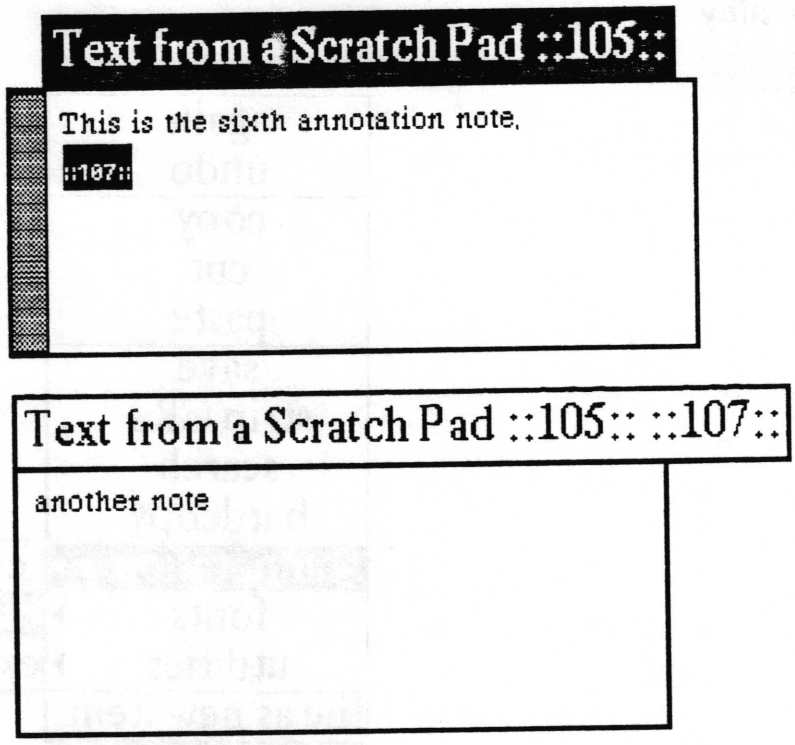
Concept Allows you to open up an annotation to edit its contents.

Procedure In either the text item or annotation window, select the annotation marker, then select **annotation > display**. An Origin Cursor will prompt you to frame the annotation window.

Effect The annotation window's title tab indicates the name of the Simple Text item from which the annotation comes, and the annotation number.

In the case where the annotation note you are displaying is contained withinin *another* annotation, the Simple Text item, followed by the first (source) annotation number(s), followed by the number you have selected, will apear in the title tab as shown below.

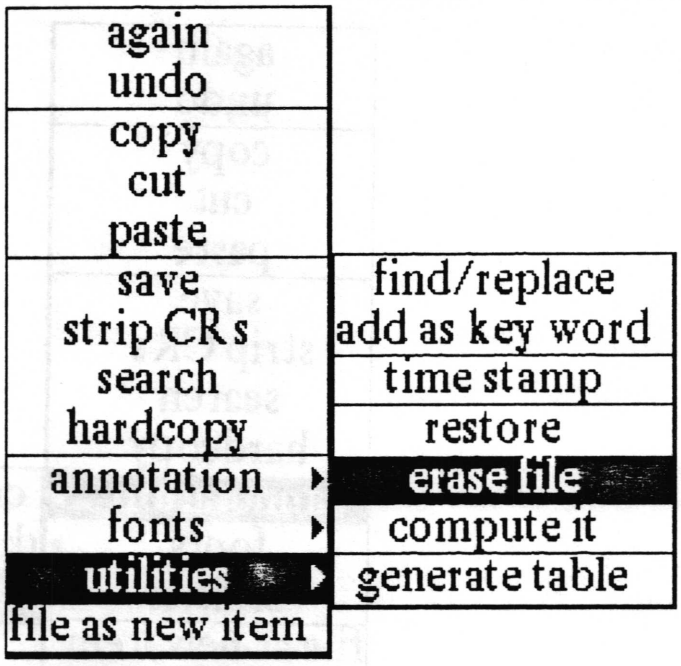
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The annotation window displayed is ready for editing, and includes its own middle mouse button menu with: **again, undo, copy, cut, paste, annotation>, fonts>, search, time stamp** and **compute it,** as shown at the top of the section. Select **close self** from the right mouse button popup to close the annotation window. Any editing you have done will be saved when the Simple Text item is saved.

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erase file



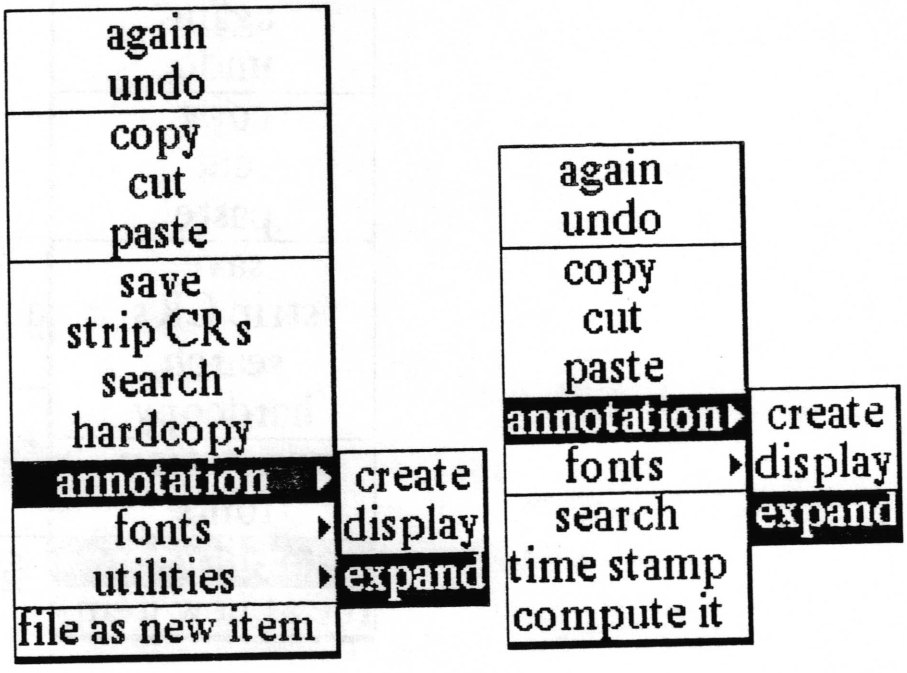
Concept Enables you to delete all text from the file whether or not it has been saved.

Procedure Select **utilities > erase file**.

Effect Before the text is actually deleted, a Confirmer will display, "This will erase all the text from the file. Are you sure?" with a **yes** or **no** selection choice. After selecting **yes**, the text window will be empty and the caret will be positioned at the uper left corner, ready for editing. **Erase file** *cannot* be undone by **utilities > restore**.

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expand



Concept Allows you to replace the annotation marker with the corresponding text.

Procedure In either the text item or annotation window, select the annotation marker (including the colons) and select **annotation > expand**.

Effect The text of the annotation replaces the marker in the Simple Text window, and becomes the current selection. When an annotation marker is expanded, the annotation no longer exists. That is, its unique annotation number no longer exists. If the selected text is made an annotation once again, a new number will be assigned. The text which was formerly an annotation will display and hardcopy as other text in the window does.

Annotations within the expanded annotation will remain as annotations.

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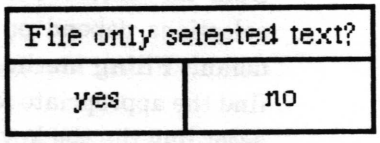
file as new item



Concept Files the entire text, or selected text, as a new item in an Information Center.

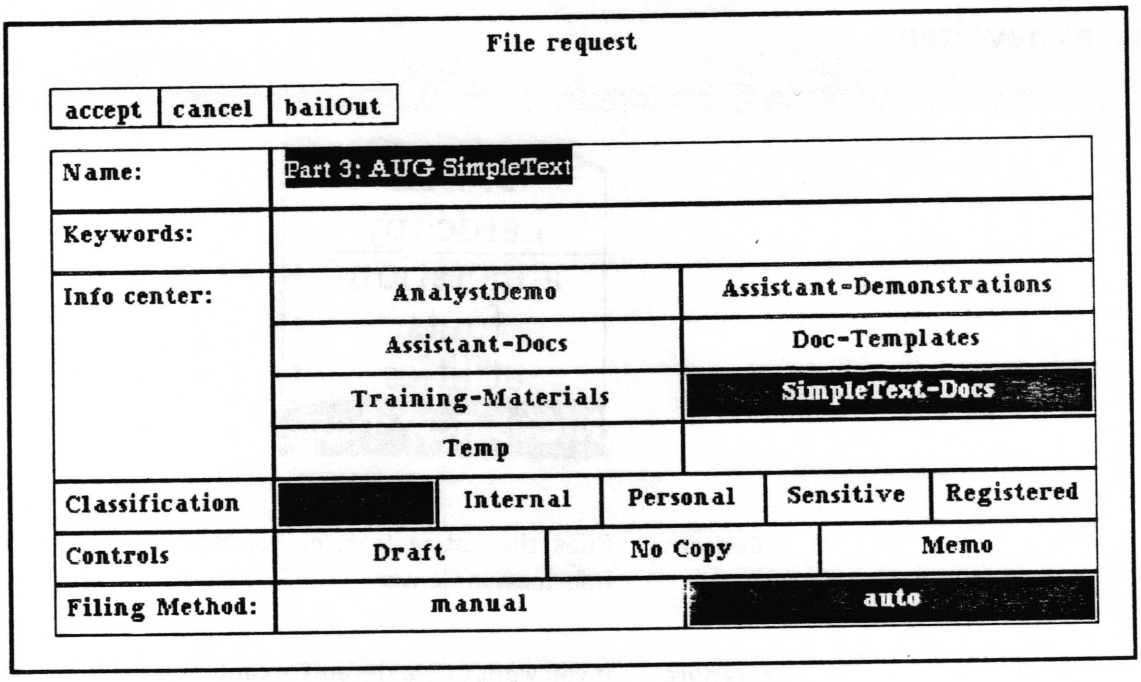
Procedure If you want to file the entire contents of the item as a new item, do not select any text. Simply select **file as new item** from the menu. A **File request** QBox like the one below will appear.

If you want to file only a part of the text, select that text before selecting **file as new item** from the menu. A Confirmer will display



Selecting **yes** will cause only the selected (highlighted) text to be filed as a new Simple Text item. Selecting **no** will file the entire Simple Text item's contents. After selecting the appropriate response, you will get the **File request** QBox.

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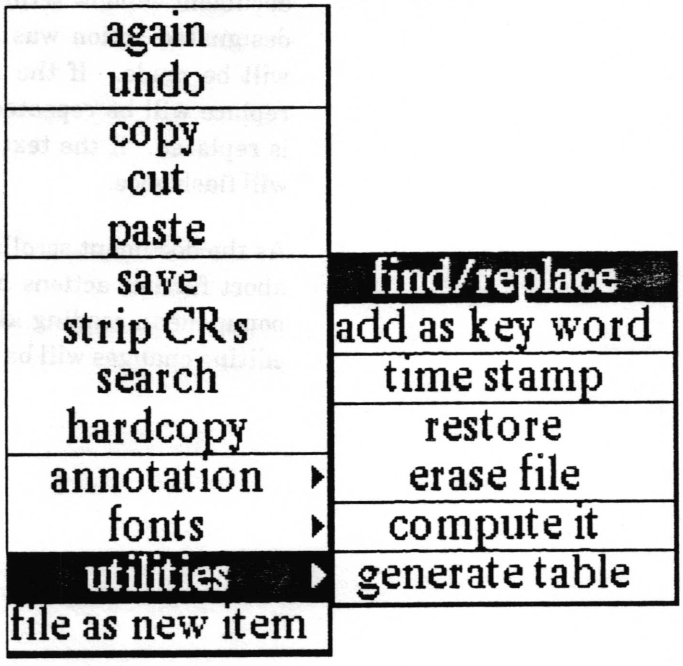


Type in the **Name:** as you want the new item to appear over the highlighted name of the current item. Type in or select any **Keywords:** you want, then select or deselect the Information Center or Centers the item is to be filed in. (The item will exist on the disk under its new name only once, even if you select several Information Centers. The Analyst will create links to the item from the different Centers. The **Classification** and **Controls** selections depend on your system and site's preference. The default **Filing method:** is **auto**. This means that the system will find the appropriate folders in the selected Information Center(s) according the the keywords you provided, and that the item will be filed into the folderr accordingly. If you select **manual**, you will get a list of folders from the first center selected. With manual filing you may only file the item into one information Center at a time. You can then select in which folders to store your item. **Accept** the QBox and the new item is created.

Effect Files the entire text item, or only the selected text, as a new Simple Text item in the selected Information Center(s).

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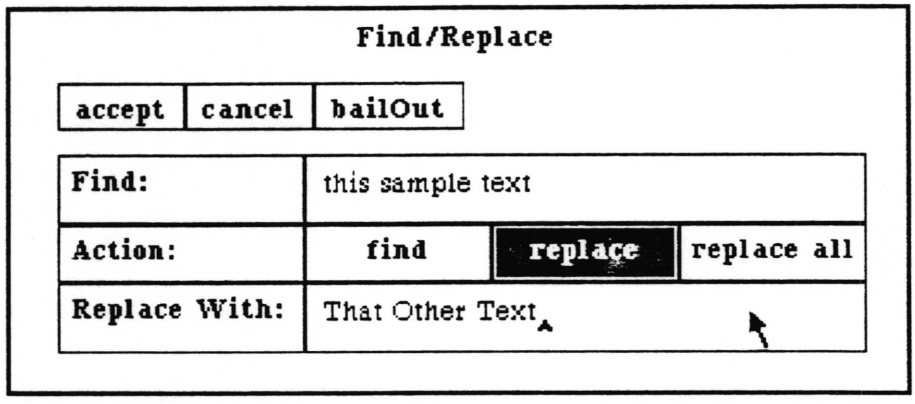
find/replace



Concept Allows you to locate the next item after the item selected, or after the location of the caret. If you only want to find all locations without replacing anything, you must select this menu option for each occurrence.

Selecting **replace** in the QBox will replace the text selected on the screen or typed in the QBox at **Find:** with what is typed in after **Replace With:**. Text must be typed in exactly as it appears. For example, if the word begins with a capital letter, it must be typed that way. **Replace** begins *after* the selected item, or after the location of the cursor. Similarly, **replace all** begins *after* the selected item or cursor position.

Procedure Select **find/replace** and type responses into the QBox.



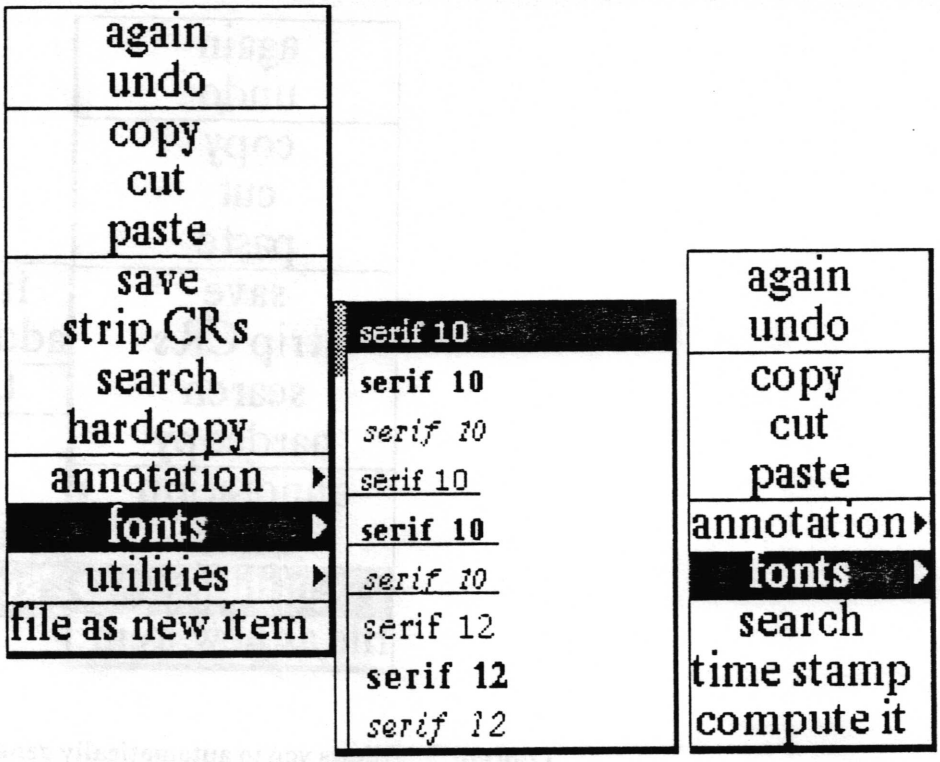
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Effect After accepting the QBox the system will begin searching for the text to be found. If it is found, it will be selected and the document window scrolled if necessary so it will be visible. If the designated action was **replace** or **replace all** the replacement will be made. If the action was **replace all**, the search and replace will be repeated uninterruptably until every occurrence is replaced. If the text is not found, the assistant rules window will flash once.

As the document scrolls during automatic **find/replace**, you can abort further actions by pressing the middle mouse button. A popup menu reading **abort** will appear. Select it and no further editing changes will be made by **find/replace**.

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fonts>



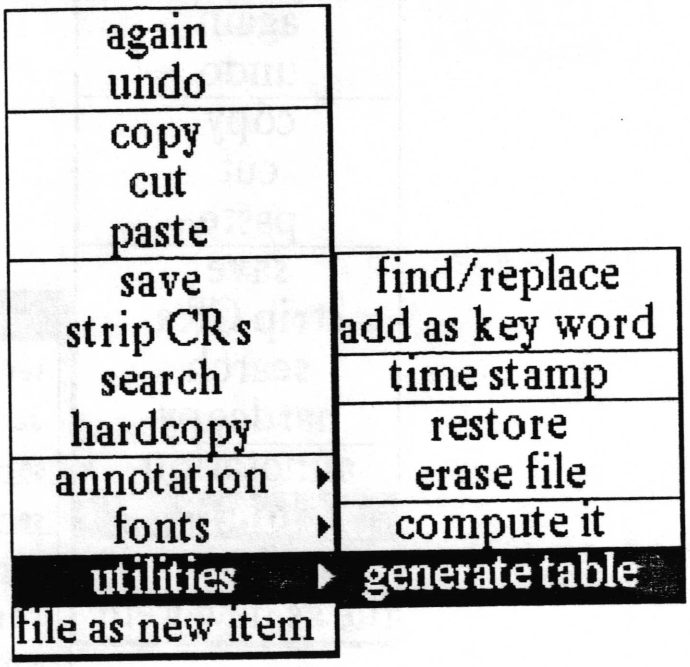
Concept Enables you to change fonts for selected text.

Procedure The submenu is a scrollable list of all the fonts that you have available in the software. To change the font of an existing piece of text, first select the text, then select **fonts>** and slide the cursor to the right. A font list will appear that scrolls as the cursor is placed at the bottom or top of the list while the middle mouse button is pressed. Select the desired appearance from this list and release the mouse button. The default font is whatever you have selected as your default system font. If you have not selected one, the overall default system font is serif 10 point normal.

Effect The selected text characters will look like the font selected from the menu. Fonts will look different on the screen from the way they do in hardcopy output. This is because the system utilizes *screen* fonts and *printer* fonts. This is particularly true of bold and italic fonts, because their screen widths are larger than their printer widths.

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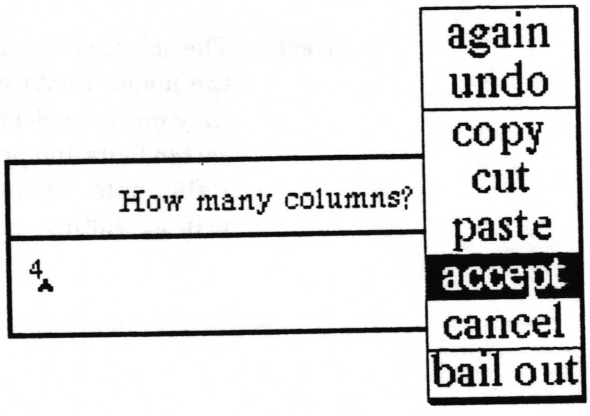
generate table



Concept Allows you to automatically generate a simple table from selected text information.

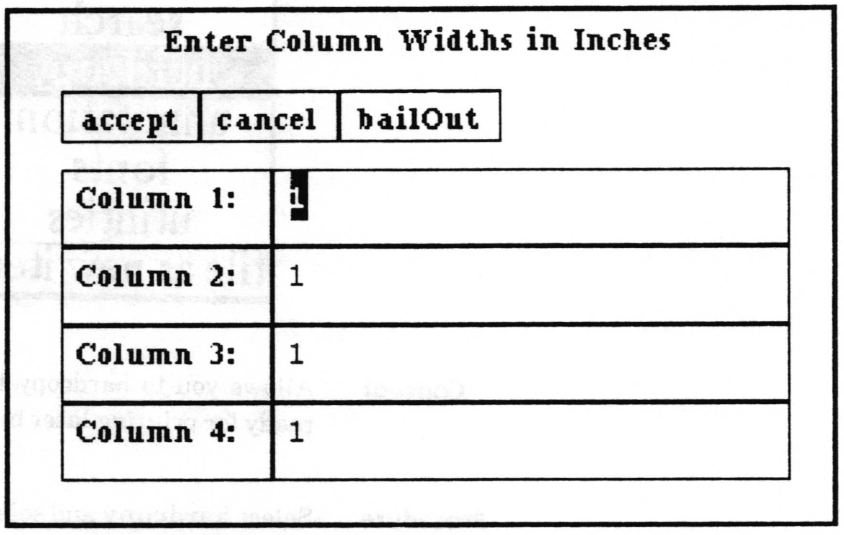
Procedure Type in column headings, separating each heading with a **<tab>**. Indicate the end of the first row of your table by hitting **<return>**. In the next row, type in the information which is to go in the columns, separating each entry with a **<tab>**, and ending each row with a **<return>**. Select all of the text for the table, then select **utilities>generate table**.

If you failed to type **<return>** after the last row/column entry in your table, you will be prompted for how many columns you want. Specify the number of columns and then select **accept** from the middle mouse button menu.



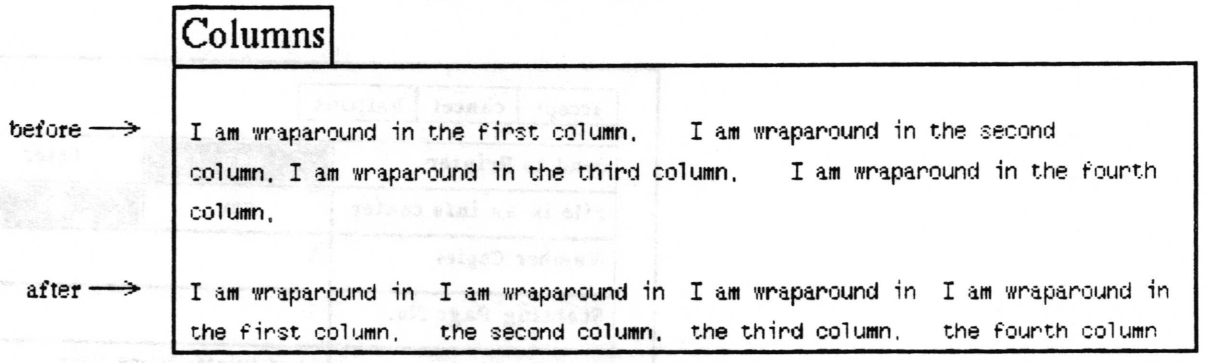
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After the number of columns are determined you will get an **Enter Column Widths in Inches** QBox set up for the correct number of columns.



Set the width of each columnn and then select **accept**. When the cursor appears in the Simple Text window, position it to the desired location for the table and select **paste**.

Effect A simple table will be displayed. Text between any two delimiters, no matter how long, will be "wrapped" to fit into the specified width of the column.



However, if an entry goes beyond a tab starting an adjacent column, the following columns will appear out of line. Likewise, the results are unpredictable when using fonts other than fixed–width. To generate more sophisticated tables, we recommend using the *Document System*.

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hardcopy

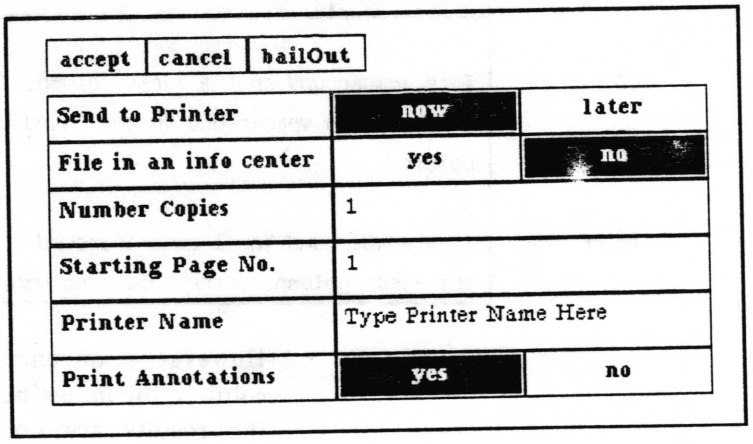


Concept Allows you to hardcopy the text, or make a printer format file ready for printing later by saving it in an Information Center.

Procedure Select **hardcopy** and select the options you want in the Hardcopy QBox. The standard hardcopy QBox items are documented in the *Hardcopy Tool* section of the *Analyst Users Guide*.

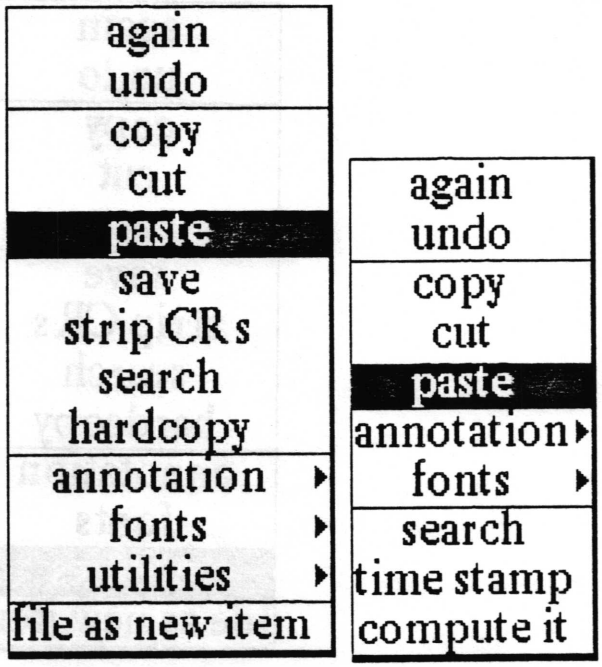
Effect Sends formatted hardcopy file of the text in the Simple Text window to your selected printer or saves the file in an Information Center.

Annotations can optionally be hardcopied along with the main body of the text by responding **yes** to the **Print Annotations** field of the hardcopy QBox.



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paste



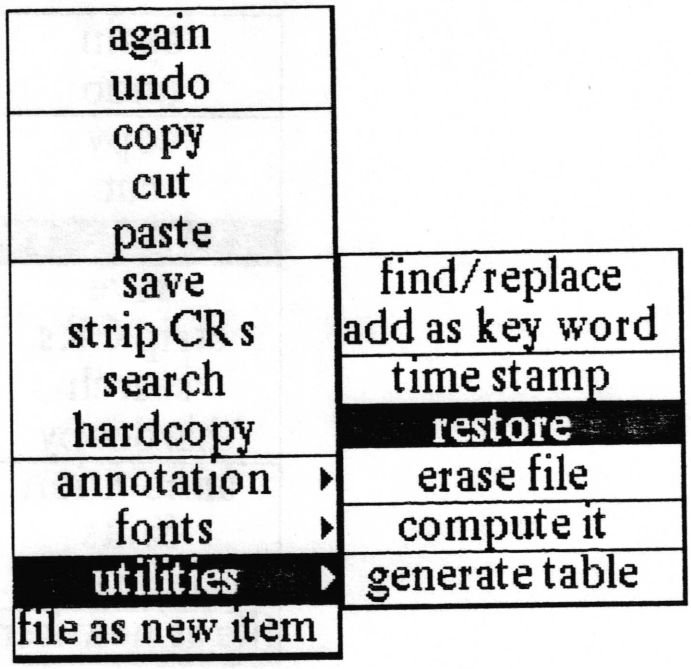
Concept Insert portions of text from other places in the window, or from other text items, without retyping.

Procedure After moving text to clipboard with **copy** or **cut**, position caret at desired location and select **paste**.

Effect Inserts the contents of the clipboard at the caret position. Anything selected at that location will be replaced by the contents of the clipboard. **Again** can be used after **paste** to perform a search and replace operation.

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restore



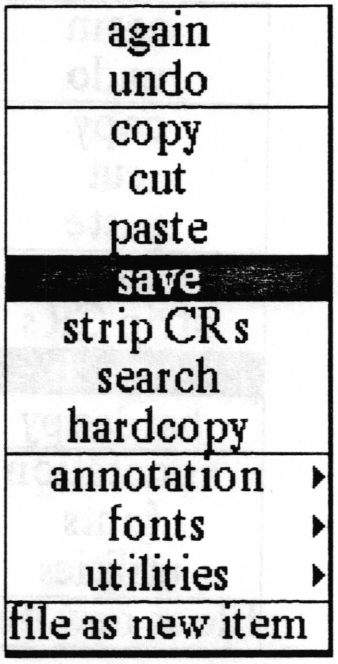
Concept You have changed your mind after doing some editing and you want to return the text to the state in which you had last saved it.

Procedure Select **utilities>restore**. There is *no* Confirmer to make sure that this is what you want to do.

Effect The text window's contents will be returned to the state in which you had last saved it, and all of the editing done since then will be lost.

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save



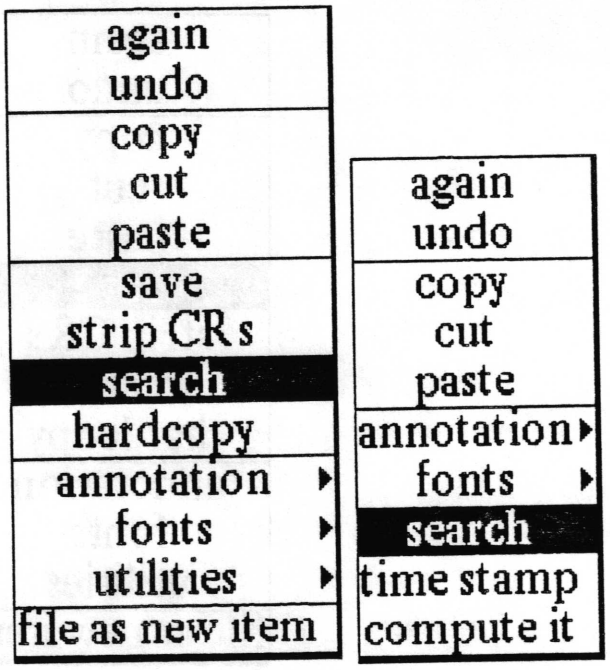
Concept Stores the Simple Text item onto the disk.

Procedure Select **save** from the middle button menu.

Effect The text item will be stored on the disk, over–writing the previously stored version.

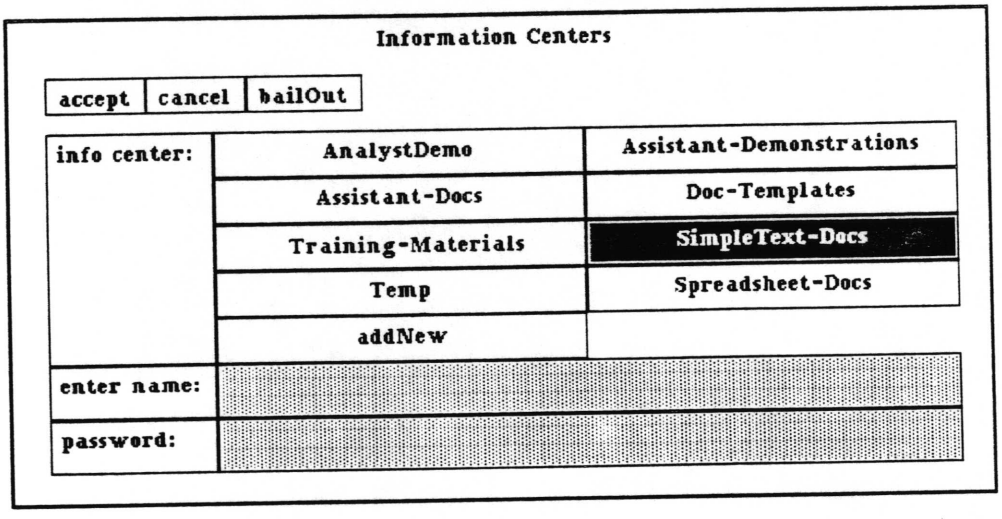
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search



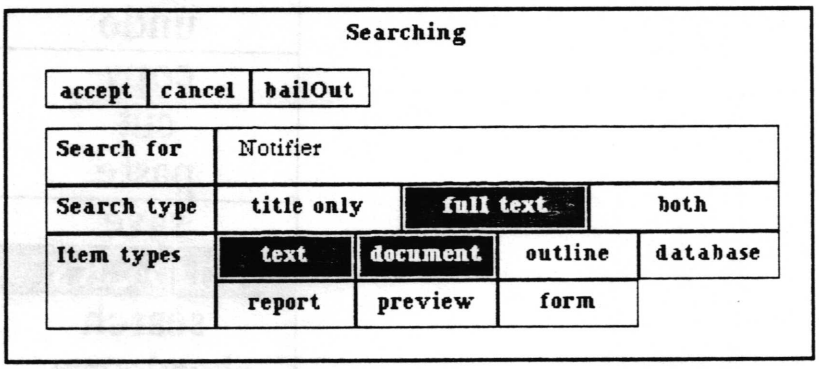
Concept Enables you to look through an Information Center for any occurrences of some selected text, looking through all of the labels or key words in the Information Center.

Procedure In either the text item or annotation window, make a text selection and then select **search**. The **Information Centers** QBox will prompt you to select a Center to search.



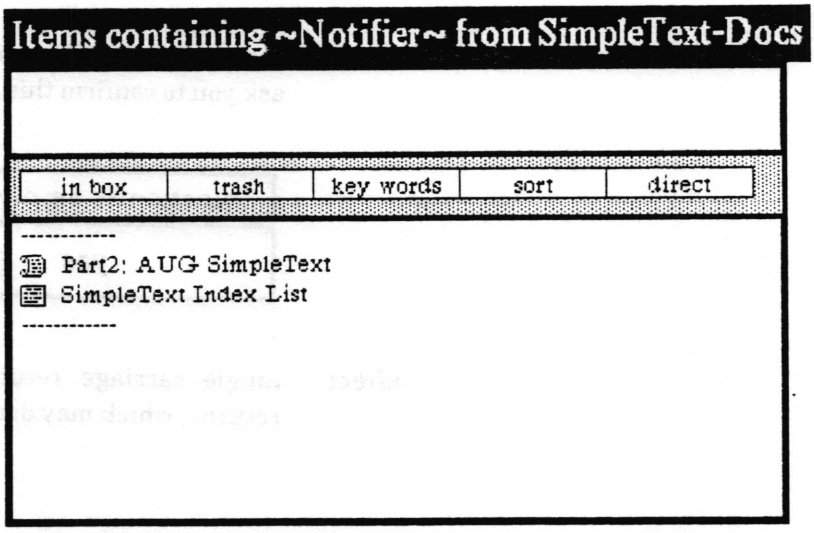
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Fill in and accept this QBox and the **Searching** QBox will prompt you to select the kind of search to perform on the Information Center chosen.



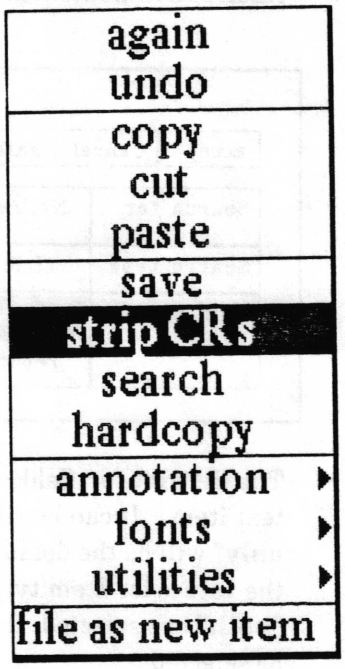
The **Search for** field will contain the current selection from the text item. It can be changed if desired. The **Search type "title only"** will be the default selection. When **"title only"** is selected, the values for **Item types** will not be visible. When **"full text"** or **"both"** are selected, the **Item types** will become visible and can be selected.

Effect A temporary folder is opened containing all of the data items which were found in the Information Center using the specified search parameters.



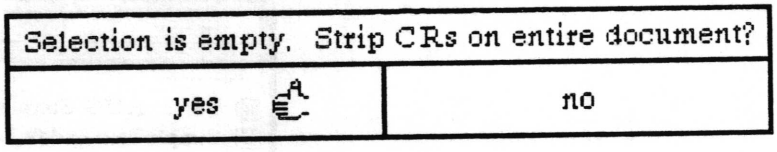
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strip CRs



Concept Removes single carriage returns from text received from another data source.

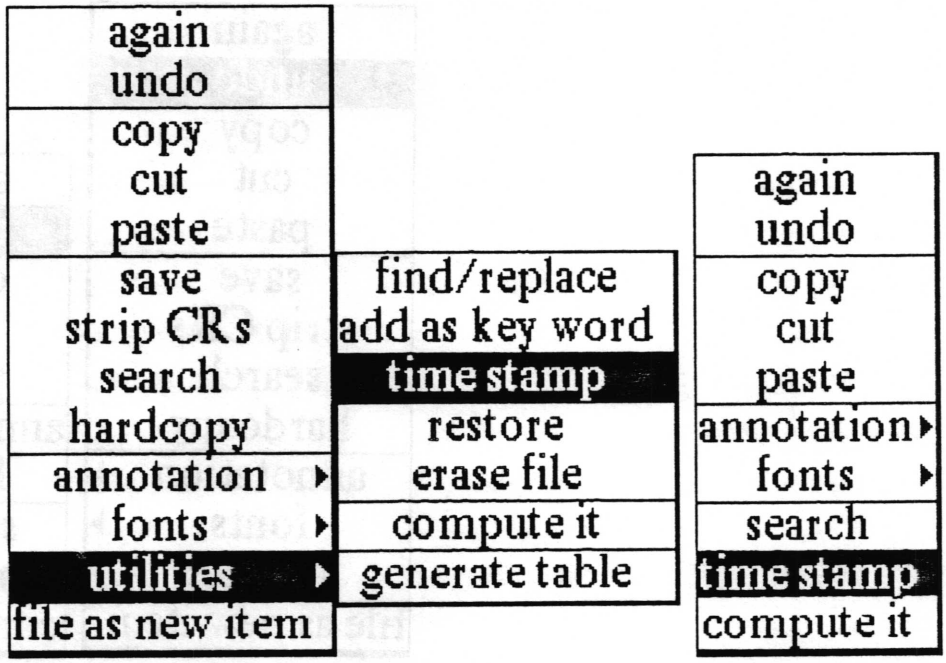
Procedure Select part of the text item to remove carriage returns from that selection only. Select no text and the entire text item will be searched for single carriage returns to remove. A Confirmer will ask you to confirm this option.



Effect Single carriage returns will be removed. Double carriage returns, which may denote paragraphs, will *not* be removed.

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time stamp



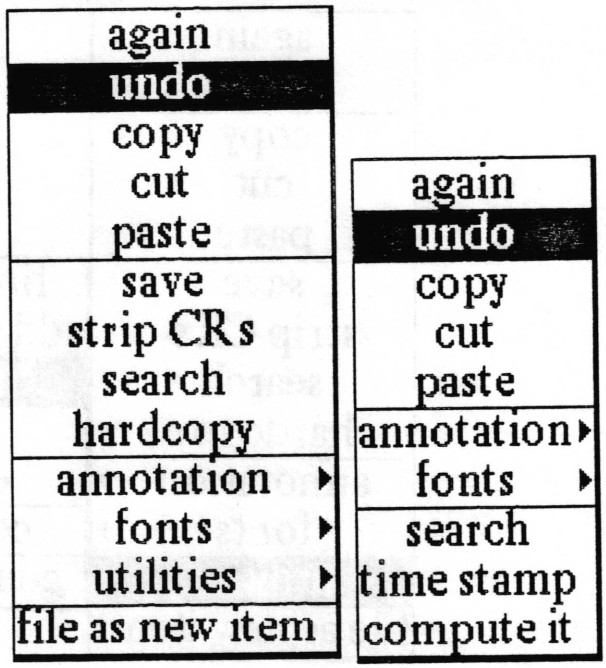
Concept Allows you to insert the date and time into the text.

Procedure In either the text item or annotation window, position the caret, or select text to be written over, and select **utilities>time stamp**.

Effect Inserts the current date and time as the position of the caret, or in place of selected text.

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undo



Concept Allows you to cancel the last text action performed. Especially useful to get back text that has been mistakenly replaced or deleted.

Procedure In either the text item or annotation window, with the caret at the position for the mistakenly deleted text to be reinserted, or with the text mistakenly entered selected, select **undo**.

Effect Undo replaces the current selection with whatever was the last text to be replaced, copied or cut. It will not undo every location in a repeated replace; it will only undo the last occurrence of the replacement.

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Simple text window right button popup menu

The right mouse button menu is fully described in, *Analyst window menus* in the *System Interface* section of this manual.

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Glossary

annotation A note, such as footnote or bibliographic reference, referenced in the text by an inserted annotation marker.

caret A small arrowhead used to mark an insertion point for either new text or selected text.

classification A labelling associated with the text which signifies its required degree of protection against un – authorized disclosure.

fixed – width A character face which has a fixed width common to all character cells.

font A complete assortment of characters of one size, one style and one design.

hardcopy Machine output in permanent form, such as paper – printed reports, listings, etc.

highlight To display in reverse video the selected portion of the document on the display screen.

keyword A substantive word or phrase which can be applied to a text item, which provides access to the item when used as a search term.

restore To bring the backup copy of the text into memory in order to recover the original copy.

reverse video Mode of displaying characters on screen opposite of normal display mode. For example light characters against dark background, as opposed to dark characters against light background.

scratch pad A scrollable simple text window for typing notes, memos, or any other text. Contents can be saved so that the next time it is opened, the window will display whatever was saved.

scroll To move image or block of text up, down, or sideways on screen, revealing new parts of image or text at top, bottom, or opposite side of screen.

scroll bar A narrow rectangular area of the screen that is displayed next to the left side of the text pane, in which the text cursor may be moved to control scrolling.

selection The area in the text, highlighted in reverse video, where the next editing function is to be applied.

serif A character face which has a short light line or stroke projecting horizontally from ends of main vertical strokes of Roman letters. A font set which has serif characters.

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text item window A scrollable window pane directly below the title tab where you may type and edit text, using the keyboard and mouse driven menus.

title tab Attached to the top left corner of a text item or annotation window, it displays a name identifying the information displayed in the window.

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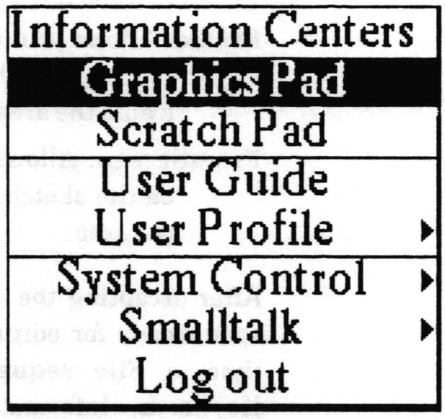
Sketch Editor

The Sketch Editor is a basic graphics tool that is used to draw, view, and edit images. The Sketch Editor is similar in structure and function to that of the Chart and Map Editors, but they have more options on the middle mouse button popup menu in the edit (middle) pane.

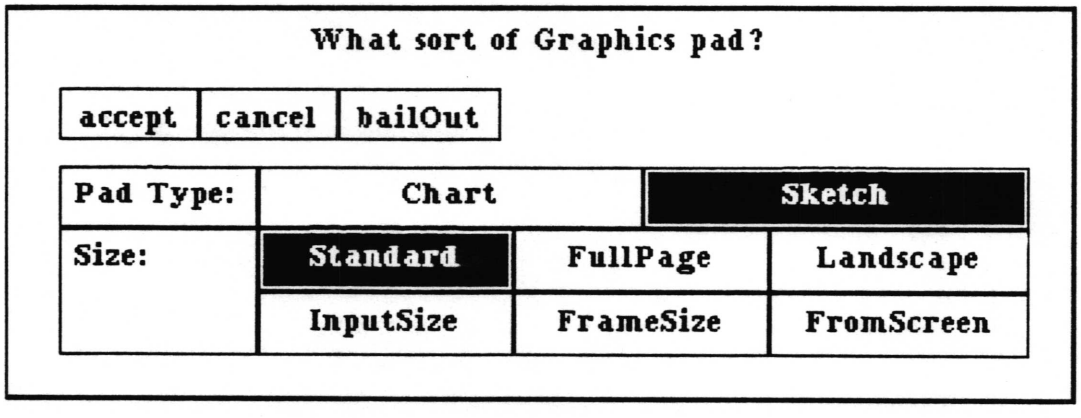
The edit pane allows you to create bitmap illustrations for the enhancement of text reports. Illustrations may be created from scratch, from digitally scanned images, or by capturing anything displayed on the screen. The editing tools within the edit pane allow icon or textual annotations to be added to the illustration.

Creating a Sketch Editor

To open a new, blank Sketch Editor, select **Graphics Pad** from the middle mouse button system menu.



A **What sort of Graphics pad?** QBox will appear. Here you will have a choice of either a Sketch pad (the default) or a Chart pad. Leave the default selected and accept the QBox.



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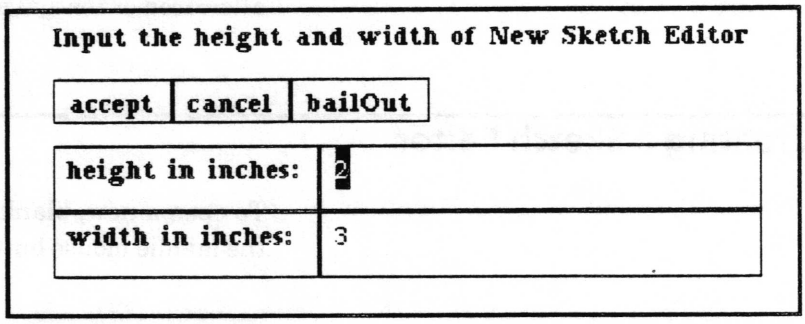
Other choices that you can select from the QBox are all related to sketch size:

Standard (the default). A 6" x 6" sketch area.

FullPage. An 8 – 1/2" x 11" sketch area oriented in portrait mode (vertical).

Landscape. An 8 – 1/2" by 11" sketch area oriented in landscape mode (horizontal).

InputSize. Allows you to specify a width and height in inches for the sketch. After accepting the **Input the height and width of New Sketch Editor** QBox, prompters will appear for you to input the width and height.



Frame. Allows you to define the size of the sketch by framing a rectangle on the screen. The Origin cursor is the prompt to frame the area.

FromScreen. Allows you to "snapshot" an area of the screen to be the sketch. The Origin cursor is the prompt to frame the area.

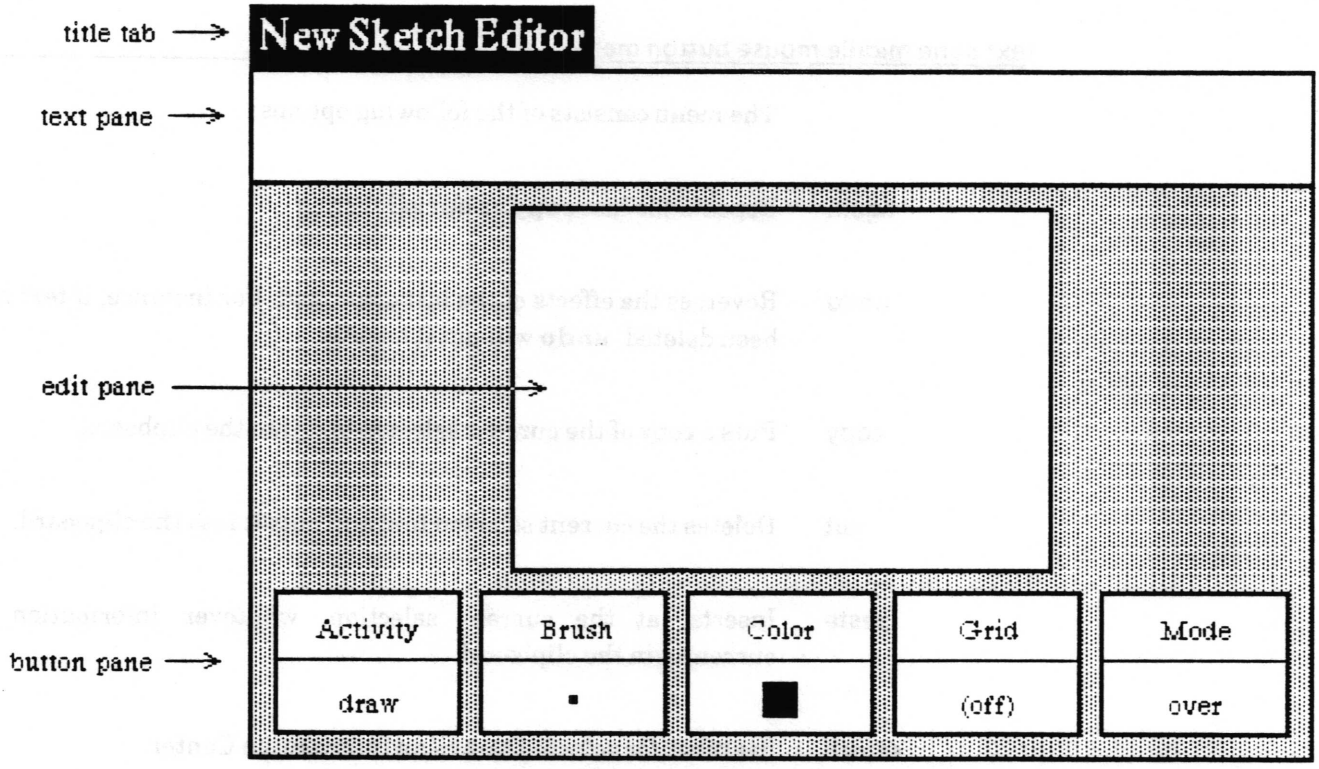
After accepting the QBox, the New Sketch Editor window will open, ready for editing. When the picture is saved for the first time, a **File request** QBox will prompt for a file Name, Keywords, Information Center, Classification and Controls parameters and Filing Method. After accepting this QBox, the name of the picture and this icon will be filed in the folder.

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Sketch Editor window layout

The Sketch Editor window consists of a title tab and three panes. The *text pane* is used for creating and editing text. It has its own popup menu. The *edit pane* is where the image or sketch appears. This pane also has its own popup menu. The *button pane* consists of five rectangles, each of which produce a list of tools or functions to use in the edit pane.

If the window contents are classified, classification bars appear at the top and bottom of the window.



title tab

A *title tab* extends above the top left corner of the Sketch Editor. It contains the label "New Sketch Editor" until this label is replaced by the title of the current image file. The title tab is highlighted in reverse video whenever the Sketch Editor window is active.

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text pane

The *text pane* enables you to type and edit text. When this pane is active, you may type and edit text in it in the same manner as Simple Text. To activate this pane, move the cursor anywhere inside the pane area and click the left mouse button.

The text pane is primarily used to generate labels. Use the middle mouse button **fonts>** selection from the menu to modify your text. For example, you may choose 24 point bold or Old English type. After the text is the way you want it, you may copy it and then paste it into the Brush so that it can be placed on the image.

text pane middle mouse button menu

The menu consists of the following options:

again Repeats the last **copy** or **cut** edit action.

undo Reverses the effects of the last command. For instance, if text has been deleted, **undo** will put it back in.

copy Puts a copy of the current selected text into the clipboard.

cut Deletes the current selected text and puts it into the clipboard.

paste Inserts, at the current selection, whatever information is currently in the clipboard.

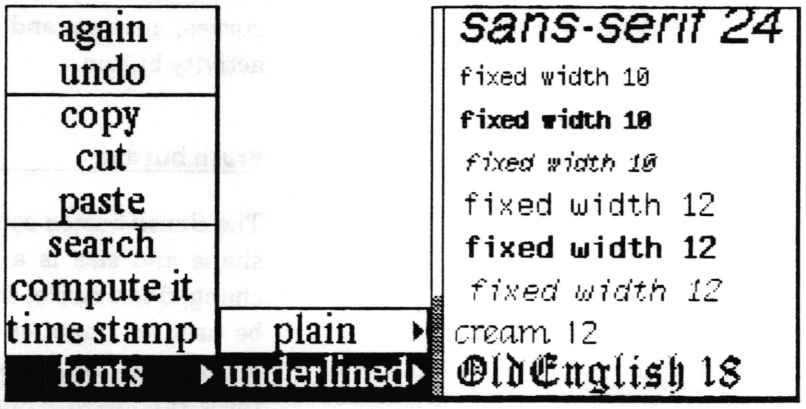
search Searches for selected text in an Information Center.

compute it Evaluates the selected arithmetic expression and prints the result.

time stamp Places the current date and time into the text pane.

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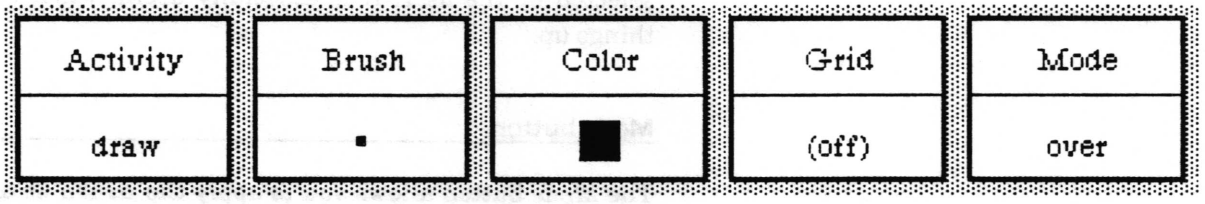
fonts > Changes the character looks of the selected text. There are two submenus for selecting plain or underlined fonts.



edit pane

The *edit pane* provides an area for displaying the image. Creating and editing of the image is accomplished by using the edit pane middle mouse button popup menu and the tools available in the button pane. Images may be filed for later retrieval. They are also easily printed in hardcopy form.

button pane



The *button pane* provides access to five parameters used in creating and editing the pictures in the edit pane through five rectangular buttons. Each button has the title at the top and the current selection at the bottom. When this pane is first seen, the default settings are displayed in the lower half of each rectangle, as shown. To make a new selection, place the cursor in the lower half of any rectangle and press the middle mouse button to get the corresponding popup menu.

The Brush used in the edit pane can be varied in function, shape, size, color, and method of application. Each button contains its own middle mouse button popup menu to control these parameters.

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Activity button

The *Activity* button controls the Brush's function. The Brush can be assigned activities such as to create circles, rectangles, lines, curves, arrows and so forth through the parameters of the activity button.

Brush button

The *Brush* button controls the Brush's shape and size. Its default shape and size is a square measuring 4 x 4 pixels. It can be changed to a circle, square, or one of several icons, and it can also be used to frame or surround a portion of the image for more detailed editing. Brushes can also interact with the clipboard and the text pane with **copy**, **cut** and **paste**.

Color button

The *Color* button controls the shades of gray or patterns used by the Brush to create an image.

Grid button

The *Grid* button controls positioning of the Brush in the edit pane. When the grid is turned on, it is not visible, but it will not allow the cursor to apply the Brush within the spacing factor selected by the user. It is especially useful when trying to line things up.

Mode button

The *Mode* button allows you to apply the Brush as an overlay or as an underlay.

classification bars (not shown)

If a classification has been assigned to any part of the information that is displayed in the Sketch Editor, rectangular bars displaying the highest applicable classification appear at the top and bottom of the Sketch Editor (above the text pane and below the button pane). The classification bars are highlighted in reverse video whenever the Sketch Editor window is active.

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Sketch Editor usage

Drawing sketches

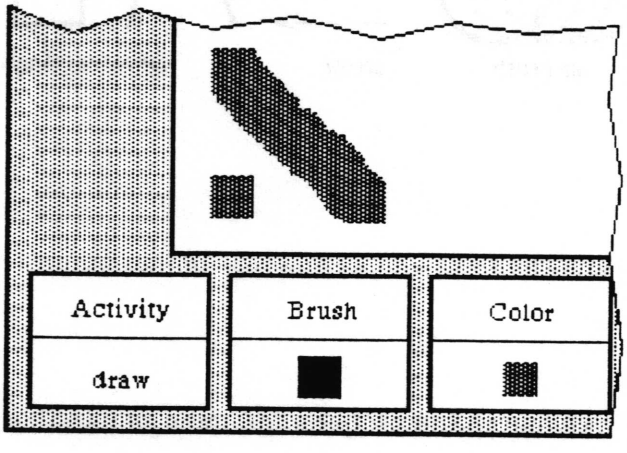
When the cursor is moved into the edit pane it becomes a paintbrush and changes to the shape of the brush specified by the Brush button. The brush is applied when the left mouse button is clicked or pressed. The exact manner in which the brush is applied will be determined by the state of the other four graphic control buttons in the button pane.

Saving the sketch

The sketch appearing in the edit pane may be saved as an image item in an Information Center by selecting **save** from the edit pane middle mouse button menu. If the window was opened from an existing image or has already been saved once, a confirmer will appear asking whether to overwrite the existing image. If you select no, or the sketch has never been saved, a **File request** QBox will appear for you to fill out.

Freehand drawing

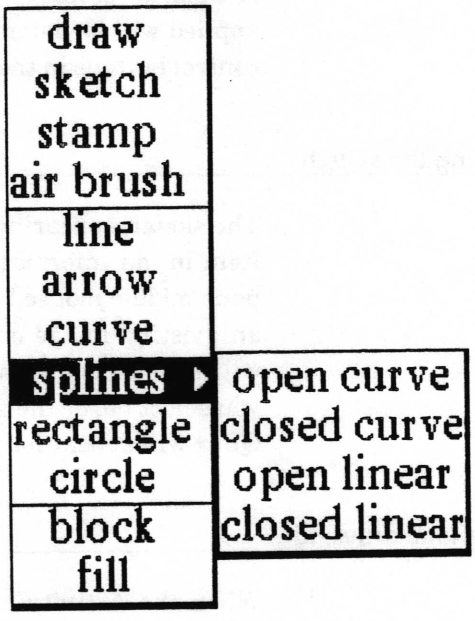
When the Activity button is set to the draw mode (its default setting) or to the sketch mode, holding the left mouse button down while moving the mouse in the edit pane will cause the brush to be applied repeatedly. The brush used in the drawing will have the shape and color which are currently specified in the Brush and Color buttons respectively. The difference between draw and sketch is that draw applies the brush repeatedly, which means that the speed with which you move the mouse can make the line look more or less dotted. Sketch fills in space between the dots, so that a solid brushline is always drawn, no matter how fast you move the mouse.



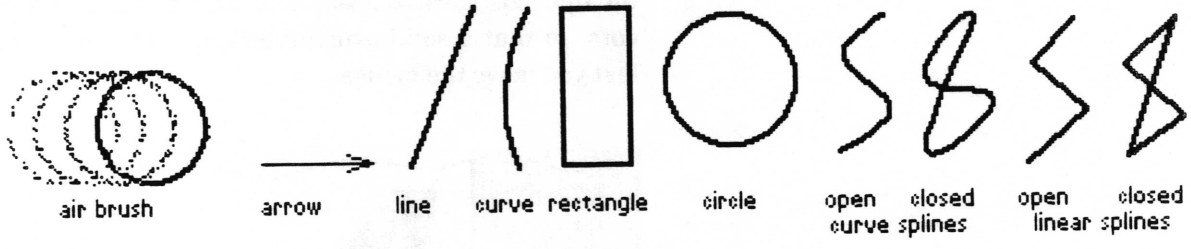
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Using paths

Several activities of the brush are available so that the brush follows a defined path in the edit pane. Available paths are straight lines, simple curves, rectangles, circles, and linear and curved splines (connect the dots). The Editor is told to draw in a path by selecting the path type in the Activity button's popup menu.



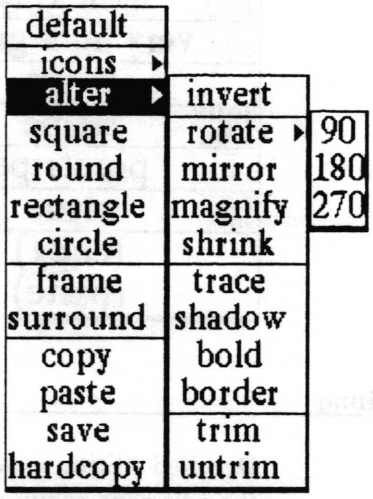
When the Activity is a path, you will be required to specify two or more points in the edit pane, and possibly take some other action to cause the path to be drawn. For details on how to use each type of path, see the "Activity middle mouse button menu" section of this document.



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Changing the brush shape

When the Brush button is set to the default shape, it is a small square with length 4 pixels on each side. To change the brush shape, press the middle mouse button over the Brush button in the button pane. This will result in a tree menu which contains many selectable shapes. While holding the middle mouse button down, the cursor may be moved through this menu and released over the desired choice. Several of the choices require you to make additional input to complete the brush definition. For details on each choice, find the item in the "Brush middle mouse button menu" section of this document.



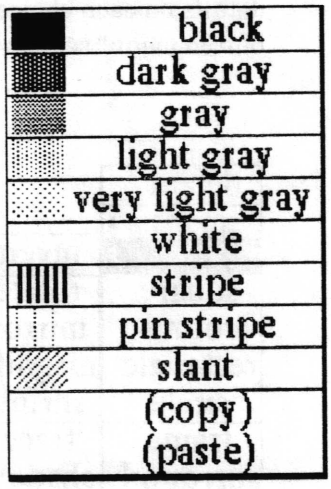
Putting Forms in the brush

The Brush can contain any Form, or image, from the screen, as well as previously saved pictures which are stored as items in Information Centers. To capture an image from the screen, use the **frame** item in the Brush's middle mouse button menu. The Origin cursor will prompt you to frame an area from anywhere on the screen. Once framed, that image will become the Brush, which then may be stamped onto the edit pane. To use a picture from an Information Center, select it, select **copy** and use the Brush's **paste** selection to apply the picture to the Brush.

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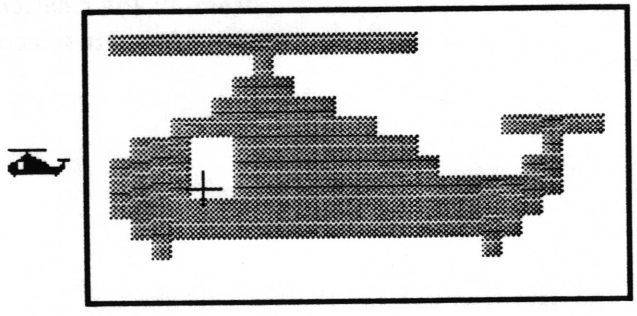
Changing the brush color

The default Color of the drawing brush is black. To change the brush color, press the middle mouse button over the Color button in the button pane. This will result in a popup menu which contains several selectable colors and patterns. While holding the middle mouse button down, the cursor may be moved through this menu and released over the desired choice. For details, see the "Color middle mouse button menu" section of this manual.



Detailed editing

Detailed editing is accomplished using the **magnify** selection in the edit pane popup menu. Any area inside the edit pane may be selected for magnification. The magnified area is displayed as an enlarged bit map. The origin cursor becomes a crosshair for precise placement at any bit in the map. Using the crosshair in the magnified area, each bit in the map may be specifically set to black or white with the left mouse button. If you click over a black bit, it will turn white. If you click over a white bit, it will turn black. If you hold the mouse button down (instead of clicking) and move the cursor, the bits beneath it will be changed to whichever color the initial bit was changed to.



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Erasing

There are numerous ways to erase an image or a portion of an image. The entire edit pane contents may be erased by selecting **erase** in the edit pane popup menu. Another way to erase an image is to select **erase** from the Mode button, and **block** from the Activity button. In this way, any area framed (blocked) will be erased. Also, you may enlarge the brush size, by selecting **square** for example, and defining the square to be 10 pixels on a side. Using **white** in the Color button, and **over** in the Mode button, you may then select **draw** in the Activity button and use the brush as an eraser, controlling it by moving the mouse. Instead of **draw** you may select **line**, still using **white** in the color button and **over** in the Mode button. This, coupled with setting the brush to a suitable size, is an excellent way to precisely control what is erased. If the brush contains an image which was stamped into the edit pane, set the Mode to **erase** and reposition the brush to cover the image you want to erase. Click the mouse button and the image will be covered. Finally, **magnify** may be used to erase areas as small as a single bit.

Saving the brush

The brush contents may be saved as a new image item in an Information Center by selecting **save** on the Brush button's middle mouse button menu and filling out the **File request** QBox that appears..

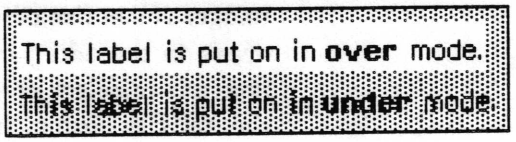
Adding text labels

Text may be typed or pasted and its font changed in the text pane. Then it may be transferred to any place in the edit pane by utilizing the text pane middle mouse menu to perform a **cut** or a **copy** (to place it in the clipboard) followed by a **paste** in the Brush button menu (to make it the brush). Then it can be drawn or stamped anywhere in the edit pane.

Text from any window may be copied and placed as a label in the image. The text pane is provided as a convenient window to type or paste text and apply fonting to it, including some fonts which are not available in other font> menus. Select and **copy** the text which is to become a label. Then go to the Brush button menu and select **paste**. This makes the text become the brush. Check that the Activity button is set to **stamp, sketch** or **draw**. The Color button should probably be set to **black**. If you want more than one label and want them aligned, turning gridding **on** in the Grid button will make it easier. If the Mode button is set to **over**, you will insure a white area around your text, but if it will wipe out something nearby, use **under**. When you are ready to place the

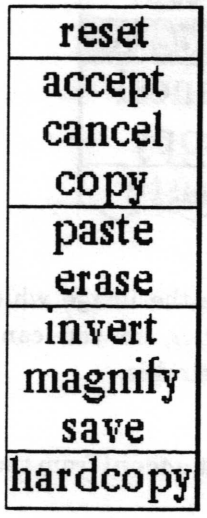
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label, move the brush to the desired location and click the left mouse button.



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Edit pane middle mouse button menu

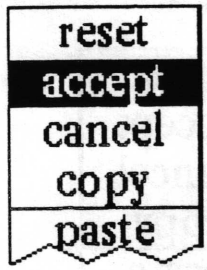


When the cursor is located anywhere within the area of this window this mouse middle button menu is available to the user.

Following in alphabetical order is a detailed description of each of the functions available in the middle mouse button menu.

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accept

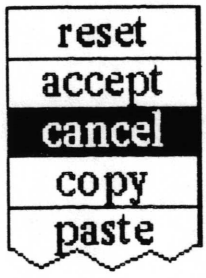


Concept Saves the image which you are currently working on, *without filing it*, so you can go back to it if subsequent editing is undesirable.

Procedure Select **accept** from the popup menu.

Effect The current image will be saved in memory. It is not saved to the disk, so it will be gone if you close the window or crash. If you select **cancel** sometime later, the image will be restored to the most recently accepted or saved configuration When working on a complex picture, it's a good idea to use **accept** frequently.

cancel



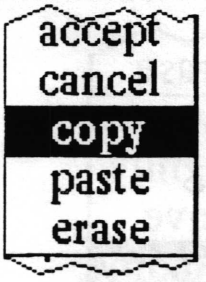
Concept Returns your image to the most recently accepted configuration.

Procedure Select **cancel** from the popup menu.

Effect Everything done since the last **accept** or **save** will be undone.

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copy

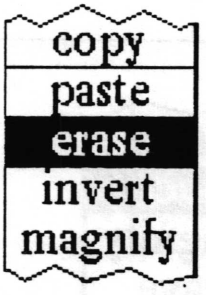


Concept Puts a copy of the editing pane contents into the clipboard so that it may be pasted in a compatible window or the brush.

Procedure Select **copy** from the popup menu.

Effect A copy of the image is put in the clipboard so it may be pasted in a compatible window, such as a Document System window, a Spreadsheet cell, or any Sketch Editor brush.

erase



Concept Deletes the entire pane contents and produces a blank edit pane.

Procedure Select **erase** from the popup menu and then select *yes* in the Confirmer.

Effect Erases the image, making the edit pane blank. If **erase** is accidentally selected, try **cancel**.

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hardcopy



Concept Enables you to print the image in the editing pane.

Procedure Select **hardcopy** from the popup menu.

Effect You will get a **Hardcopy** QBox to fill out and your sketch will be sent to the printer. If the image is too wide or too large, the mode and size default options will be set to landscape and/or half. Selecting **accept** at the top of the QBox will initiate creation of the print file. See the "Hardcopy Tool"subsection in the *System Interface* section of this document if you need more information.

invert



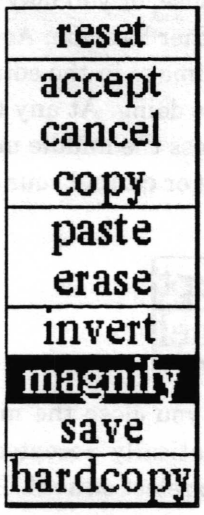
Concept Reverses the bits in the image: that is, all the white bits will be set to black, and all the black bits will be set to white.

Procedure Select **invert** from the popup menu.

Effect The image will have the bits changed, black to white and white to black.

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magnify

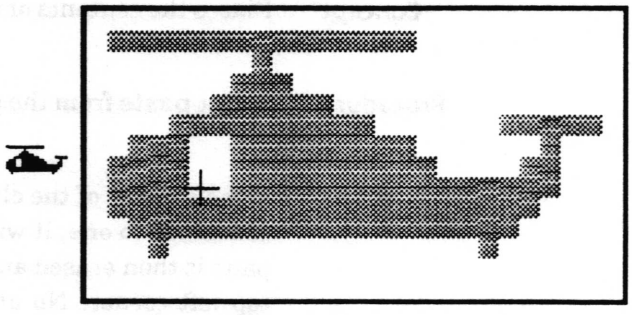


Concept Enables precise control of each bit in the editing pane by enlarging specified areas.

Procedure Select **magnify** from the popup menu. An Origin cursor will allow you to frame the area you want magnified. Any area outside the edit pane will be ignored

After framing the desired area (generally, you will find it desirable to frame only very small areas), move the cursor so the magnified image will not be over the originally framed area. If you place the magnified image over the originally framed area, editing changes will not be implemented. Click the left mouse button to see and edit the magnified image. The magnification window itself has a middle mouse button menu for accepting and canceling changes.

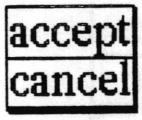
Effect The magnification factor is determined by the size of the area framed.



The cursor becomes a crosshair inside the magnified area. When you press the left mouse button, the bit under the crosshair will either change from black to white, or white to black. You may

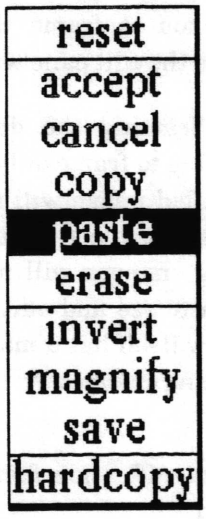
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either keep the button down and draw with this color by moving the mouse, or you may release the button and move the crosshair to another location. As you change the bits, they will also change in the image in the editing pane so you can see the effect of what you are doing. At any time during the magnification editing you can press the middle mouse button to get a small popup to either **accept** or **cancel** your changes.



When you close the magnified image window, any changes are automatically accepted, so if you don't want your changes, be sure to select **cancel**. To close the magnified image window, move the crosshair cursor out of the magnified area and click the left mouse button once.

paste



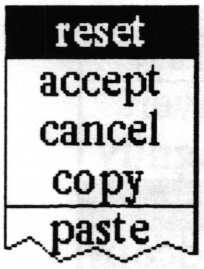
Concept Places the contents of the clipboard into a editing pane.

Procedure Select **paste** from the popup menu.

Effect If the content of the clipboard is not already an image, but can be converted to one, it will be (thus text will be converted). The edit pane is then erased and the image is stamped on it, aligned at the top left corner. No attention is paid to the value of any of the buttons in the button pane. (Generally you will find it more desirable to paste into the brush, so that the image can be placed anywhere in the edit pane.)

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reset



Concept Resets the five buttons in the button pane to their default settings. The default settings are listed below.

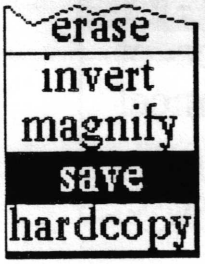
Procedure Select **reset** from the popup menu.

Effect The buttons are reset as follows:

button	default setting
Activity	draw
Brush	4 pixel x 4 pixel square
Color	black
Grid	(off)
Mode	over

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save



Concept Saves the image to a file – either overwriting a previous version or creating a new image item in an Information Center.

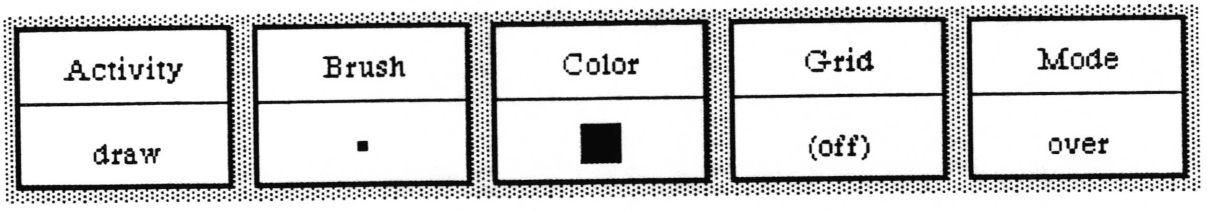
Procedure Select **save** from the popup menu.

Effect If this Editor was opened on an existing image item in an Information Center, or you have saved it previously, a Confirmer will ask if you want to overwrite the existing file. If you select **yes**, the image will overwrite the previous version. If you select **no**, or if the image has never been saved before, a **File request** QBox will appear for you to fill in the necessary information to create an image item for one or more Centers Selecting **accept** in the QBox will complete the saving of the image.

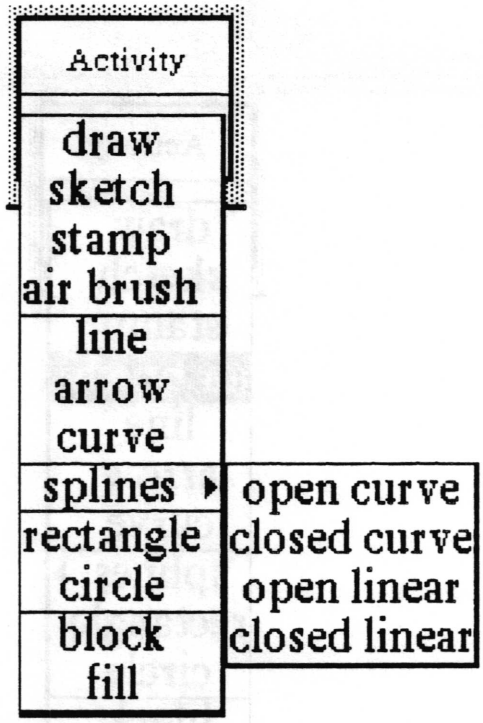
If the image Editor was opened by selecting **picture > edit** on an image in a Document (see the *Document System* section of this manual for more details), selecting **save** will first bring up a Confirmer asking if you want to create a new data item. If you select *yes*, the **File request** QBox will appear. If you select *no*, all copies of the image in the Document will be replaced with the new version.

Activity middle mouse button menu

The Activity button sets the type of operation to be performed with the Brush. Activity options are listed in the middle mouse button menu. This section explains each option in alphabetical order.

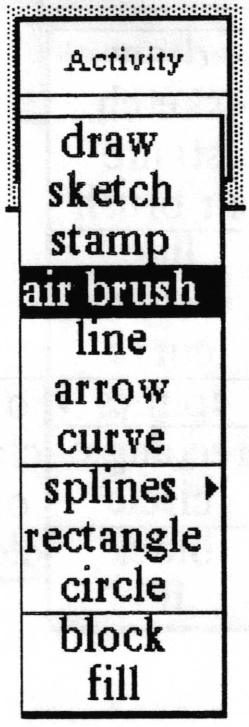


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air brush



Concept Enables you to gradually fill an area with the currently set Color.

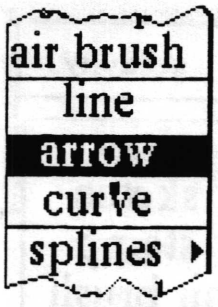
Procedure With the desired Color selected, and the Mode set to under or reverse, select **air brush**. Press the Brush in the image edit pane.

Effect The longer the mouse button is pressed, the greater the number of bits with which the **air brush** fills the area. To create the image below, the Brush was set down in four different places in the pane moving from left to right, and the mouse button was held down for increasing amounts of time at each new position.



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arrow

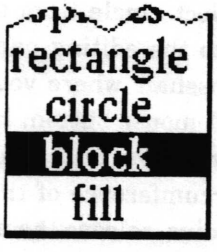


Concept Draws an arrowhead when the mouse button is released.

Procedure Select a Brush such as default, square, or round, any Color or Mode and select **arrow**. Position the cursor for the location of the arrowhead and click the left mouse button.

Effect When the mouse was clicked in a spot, an arrowhead will be drawn at that spot. If the mouse was drawn across the edit pane before releasing the button, a line will be drawn, ending with an arrowhead. When the Brushes **icon** or **symbol** are chosen, no arrowhead will be drawn.

block



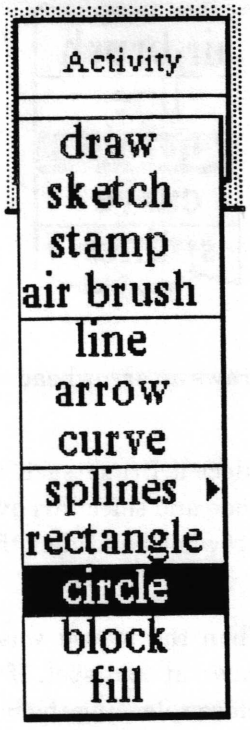
Concept Enables you to fill in a rectanglar area with the color or pattern currently selected in the Color button.

Procedure Select **block** from the popup menu. When you move the cursor into the edit pane it will change into an Origin cursor. Move it to the top left corner of the area you want to fill, then press the left mouse button and pull the corner cursor to the bottom right corner of the area.

Effect When you release the button, the framed area will be filled in with the color in the Color button according to the mode set in the Mode button.

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circle



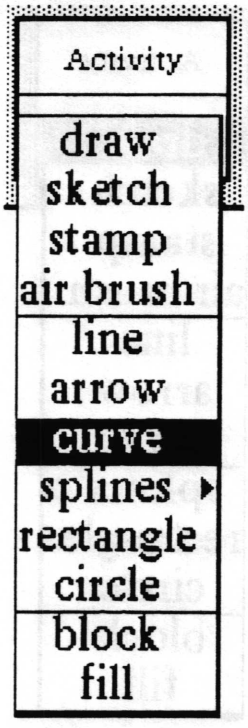
Concept Enables you to quickly draw a circle with the current Brush.

Procedure Select **circle** from the popup menu. When you move the cursor into the editing pane it will change into a crosshair. Place the crosshair where you want the center of the circle and press the left mouse button. Hold the button down and move the crosshair away from the center. Note the "rubberband" line indicating the circumference of the circle. After you have reached the desired radius, release the mouse button.

Effect A circle will be drawn about the center point at the specified radius. The Mode and Color selections will influence the appearance of the circle. If the Mode button is set to **under**, the circle will be drawn solidly in the specified color. If the Mode is set to **over**, the circle will not be drawn solidly unless it is a solid rectangle.

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curve



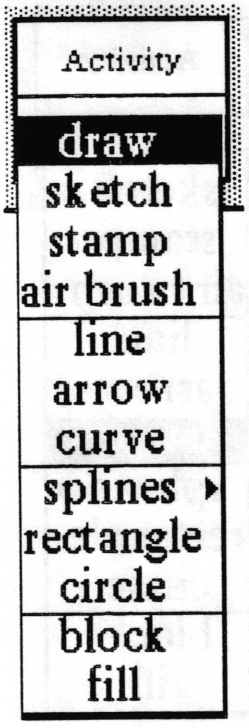
Concept Allows you to draw a curve using the Brush.

Procedure Select **curve** from the popup menu. Move the cursor to the desired starting point of the curve and press the left mouse button. Hold the mouse button down and move the cursor to the desired end point. Release the button. A "rubberband" line connects the two points and the cursor has changed to a crosshair. Move the crosshair to specify the apex of the curve. You will see a repeated drawing of a curved line as it tries to follow the apex point. When the curve has the desired shape, click the left mouse button and the curve will be drawn..

Effect The appearance of the curve will depend on the values of the Mode, Color, and Brush buttons. The curve fills in with a solid line if the Mode button is set to **under**, and the cursor returns to the shape selected in Brush. If Mode is set to **over**, the line will only be solid if the Brush is a solid rectangle.

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draw



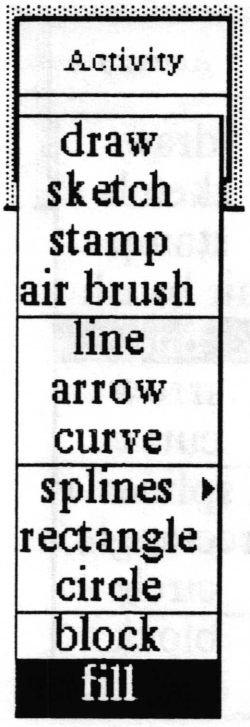
Concept This is the default setting. It enables the cursor to perform like a paintbrush.

Procedure Select **draw** from the popup menu. As the cursor is moved about the editing pane, the Brush image is "painted on" whenever the left mouse button is pressed or clicked.

Effect The resulting appearance depends on the Brush, Color, Grid, and Mode button selections, and the speed at which the cursor is moved while drawing. **Draw** applies the Brush repeatedly, which means that the speed with which you move the mouse can make the line look more or less dotted. If the effect you want is with more "fill in", try **sketch**.

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fill



Concept Fills an enclosed area with the color or pattern in the Color button.

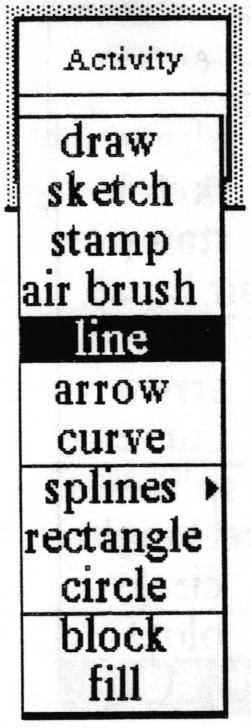
Procedure Select **fill** from the popup menu. When you move the cursor into the edit pane it will change into a crosshair. Place the crosshair within the area you want filled and press the left mouse button.

Note: If the area in which you place the crosshair is not completely enclosed, the entire image area will be filled in. The only way to get out of a **fill** once it is enacted is by hitting <control> <c> and closing the resulting window.

Effect The cursor will change to a coffee cup as the area fills in with the Color button selection. When the area is completely filled the cursor will change back into the crosshair.

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line



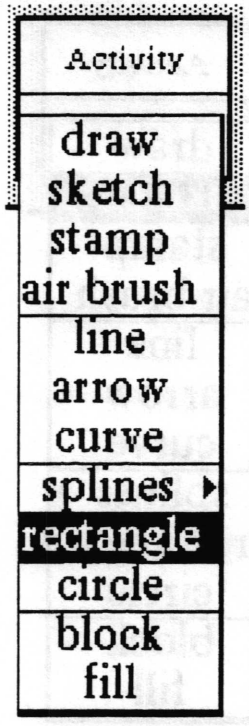
Concept Allows you to draw a line with the Brush.

Procedure Select **line** from the popup menu. Move the cursor to the desired starting point of the line and press the left mouse button. Hold the mouse button down and move the cursor toward the desired end point. As you move the cursor, note that it is connected to the starting point by a "rubberband" line. To draw an absolutely horizontal or vertical line, move the cursor until the "rubberband" line is smooth with no "stairsteps" showing.

Effect When you release the button a line defined by the Brush shape will connect the starting point to the point at which the button was released. If the Mode button is set to **under**, the line will be drawn solidly in the specified color. If the Mode button is set to **over**, the line will be solid only if the Brush is a solid rectangle. This is because there is "white space" around any Brush except the solid rectangle.

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rectangle



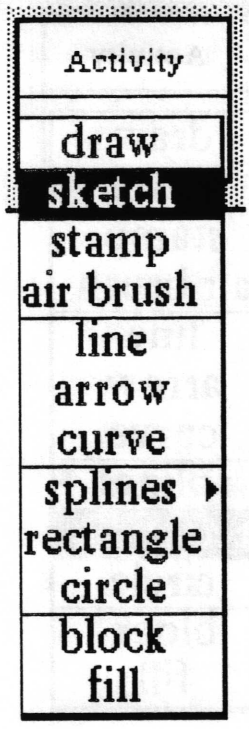
Concept Enables you to quickly draw a rectangle with the current Brush.

Procedure Select **rectangle** from the popup menu. When you move the cursor into the editing pane it will change into an Origin cursor. Move the cursor to the top left corner of the rectangle you want to draw, press the left mouse button and pull the cursor to the bottom right corner of the rectangle.

Effect When you release the button the rectangle will appear. The appearance of the rectangle will depend on the values of the Brush, Color, and Mode buttons. If the mode is **under**, the rectangle lines will be drawn solidly in the specified color. If the Mode is set to **over**, the lines of the rectangle will be solid only if the Brush is a solid rectangle.

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sketch



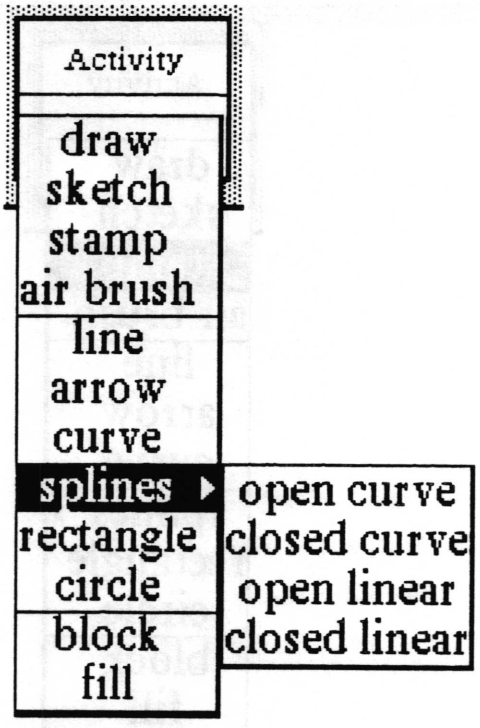
Concept Enables the cursor to perform like a paintbrush.

Procedure Select **sketch** from the popup menu. As the cursor is moved about the editing pane, the Brush image is "painted on" whenever the left mouse button is pressed or clicked.

Effect The resulting appearance depends on the Brush, Color, Grid, and Mode button selections, and the speed at which the cursor is moved while drawing. **Sketch** differs from **draw** in that it attempts to fill in the space between the points "noticed" by the system. The speed with which you move the mouse would otherwise make the line look more or less dotted.

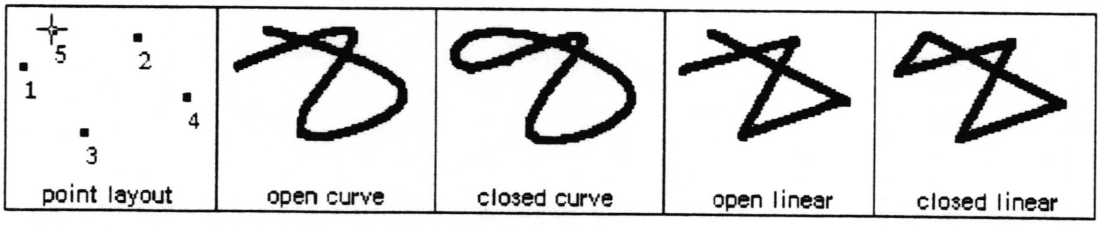
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splines>



Concept Enables you to draw straight or curved lines with the Brush through a set of points you place in the edit pane. With **closed curve** and **closed linear**, the last point entered will be connected to the first point to close the curve or line.

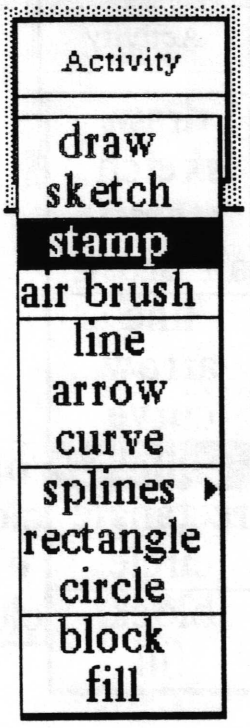
Procedure Select **splines>** and the desired option from the submenu. The cursor becomes a crosshair for precise placement of the points. Place the crosshair at each desired location and click the left mouse button. The points are numbered sequentially as the button is clicked. When you have entered all the points you want, click the middle mouse button and the line or curve will be created.



Effect The numbers will disappear and the points will be connected in the order in which they were entered. The appearance of the lines or curves will depend on the values of the Brush, Color and Mode buttons. Using **under** mode will force the lines or curves to be solid.

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stamp



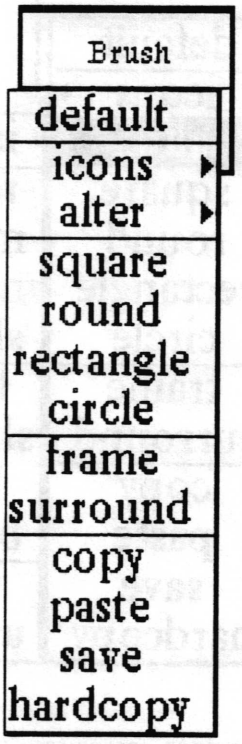
Concept Enables you to place a copy of the Brush image at a precise location.

Procedure Select **stamp** from the popup menu. Position the cursor at the desired location and click the left mouse button to "stamp" it in place. If the mouse is moved after the left button is pressed the image will not be affected (as it would be using **draw**).

Effect The appearance of the stamped Brush will depend upon the Mode and Color button settings.

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Brush middle mouse button menu

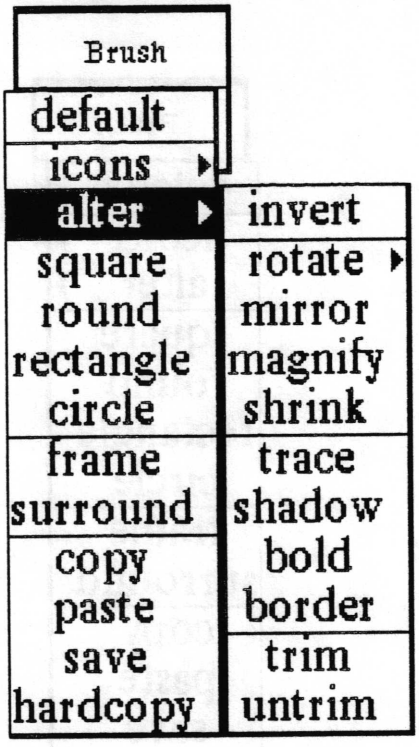


The Brush button provides the tools for manipulating the shape of the drawing brush on its middle mouse button popup menu.

Following in alphabetical order is a detailed description of each of the functions available in the middle mouse button menu.

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alter



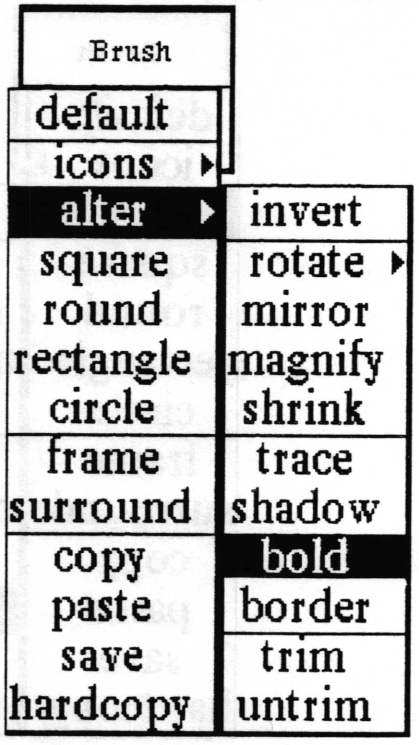
Concept Provides access to a submenu with options which enable you to make various alterations to the current Brush image. These options are listed alphabetically with the other selections which follow.

Procedure Select **alter >** and the desired option from the submenu.

Effect The contents of the Brush will be modified according to the selection from the submenu. Refer to the alphabetical listing in this section of the manual for each submenu item.

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bold



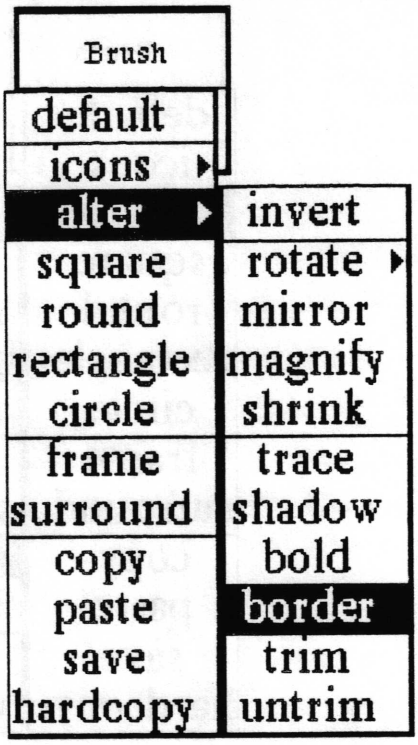
Concept As with the application of bold to fonts elsewhere in the Analyst, the image is created with a heavier line. The image in the Brush can be made increasingly "fatter" with multiple selections of this item.

Procedure After selecting the Activity, Brush shape, Color and Mode, select **alter > bold** from the menu tree.

Effect The contents of the Brush will be made 1 pixel wider at certain positions. For example, a 6 pixel rectangular Brush will be modified so that the left vertical line is 7 pixels wide.

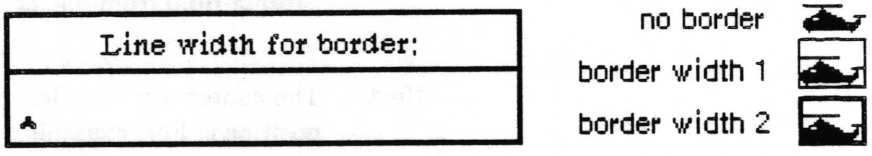
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border



Concept Allows you to put a border around the brush image.

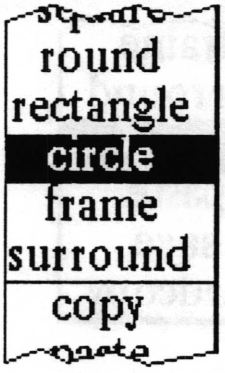
Procedure Selecting **alter> border** from the popup menu produces a prompter requesting border width information. The width is expressed in pixels.



Effect A border of the selected Color will be put on the brush image. The border starts at the outer edge of the brush image. As the border width increases it covers more of the image. Once the border width is specified it can not be decreased. To have a narrower border you must first restore the original brush image and then type in a narrower border line width.

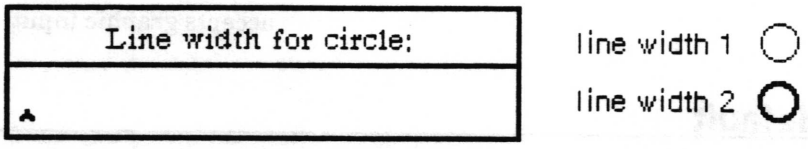
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circle



Concept Enables you to create a circular brush.

Procedure Select **circle** from the popup menu. Type into the prompter the line thickness of the circle. This is measured in pixels.

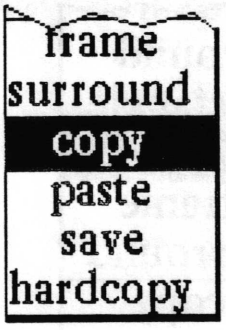


After hitting the <return> key you will get a crosshair cursor to place at the center of the desired circle. Press the left mouse button and hold it down while moving the mouse to define the size of the circle. Release the button when the circle is the desired size.

Effect The Brush is now a circle with your specified size and line thickness.

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copy

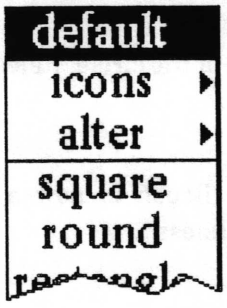


Concept Puts a copy of the brush image into the clipboard.

Procedure Select **copy** from the popup menu.

Effect Once in the clipboard, the Brush image can be **pasted** into the edit pane of any graphics window or into any other window that accepts graphic input.

default



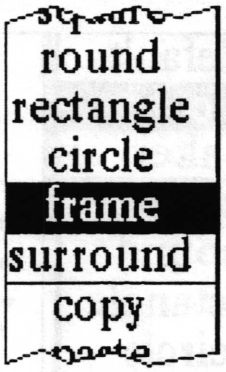
Concept Restores the Brush to the one available when a Sketch Editor window is first opened.

Procedure Select **default** from the popup menu.

Effect Changes the brush to a black square four pixels on a side.

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frame

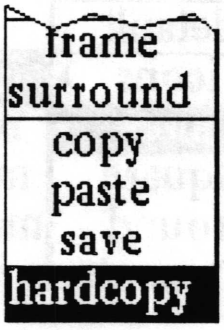


Concept Enables you to frame *anything you can see on the screen* to use as your brush.

Procedure Select **frame** from the popup menu. An Origin cursor will appear. Move it to the top left corner of what you want and then press the left mouse button down. Move the cursor to frame the desired area for your brush image and then release the button.

Effect The framed area is now your brush image.

hardcopy



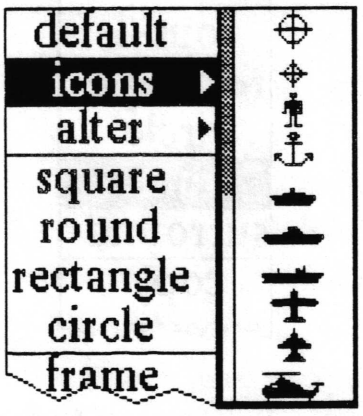
Concept Allows you to print the current brush image.

Procedure Select **hardcopy** from the popup menu. The same QBox as that for the hardcopy in the edit pane will appear.

Effect After accepting the QBox, the brush image will be printed.

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icons>

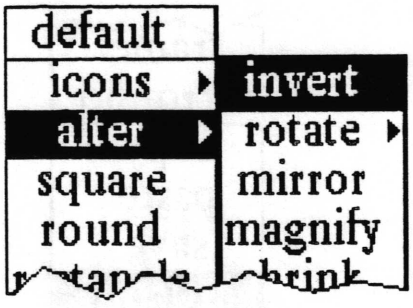


Concept Replaces the current contents of the brush with an icon.

Procedure Select **icons>** from the popup menu. This selection produces a scrollable submenu of available annotation icons. Move to the right to select the icon.

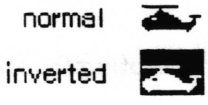
Effect The brush will assume the shape of the selected icon.

invert



Concept Changes the brush image to the reverse video of itself.

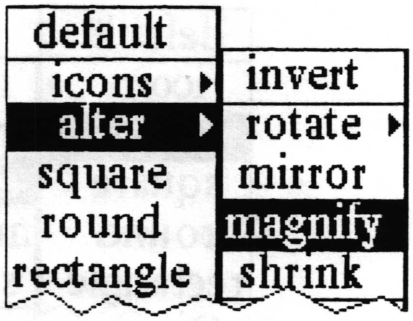
Procedure Select **alter> invert** from the popup menu.



Effect The white bits in the brush will be changed to black bits, and vice – versa.

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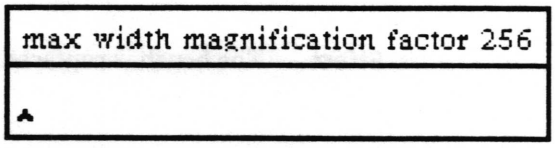
magnify



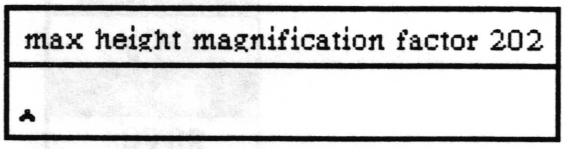
Concept Enables you to *enlarge* the current brush image.

Procedure Select **alter> magnify** from the popup menu.

This produces a prompter requesting width magnification information. The maximum magnification factor is indicated. A magnification of 1 results in no change, 2 doubles the size, and so on.



Type in the integer value for the desired width magnification factor followed by a carriage return. Another prompter requesting height magnification information will appear.

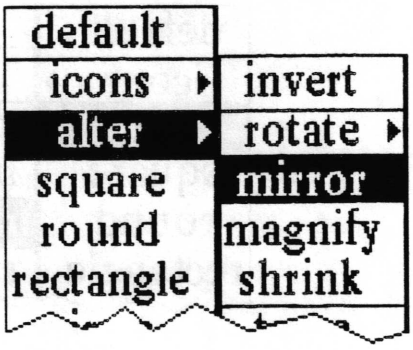


Type in the integer value for the desired height magnification factor followed by a carriage return. The image represented on the Brush button will reflect the change.



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mirror



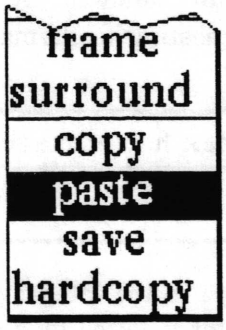
Concept Changes the brush to look as it would look in a mirror.

Procedure Select **alter> mirror** from the popup menu.



Effect The brush is replaced by a mirrored image of itself.

paste



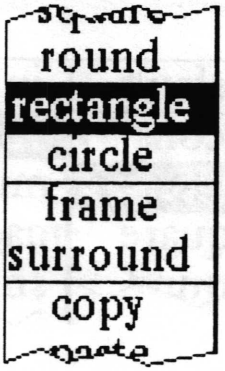
Concept Replaces the current contents of the brush with the contents of the clipboard.

Procedure Select **paste** from the popup menu.

Effect If the content of the clipboard is not already an image, but can be converted to one, it will be (thus copied text is converted to an image). The image is then placed in the brush.

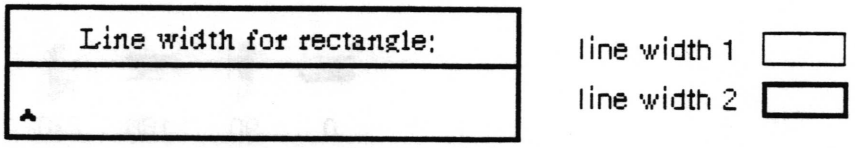
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rectangle



Concept Enables you to create a rectangular brush.

Procedure Select **rectangle** from the popup menu. Type the rectangular frame line thickness in the prompter. This is measured in pixels.

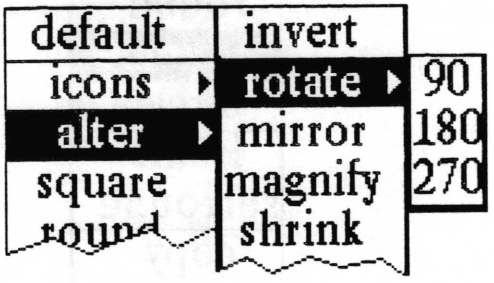


After accepting the width by typing a carriage return, you will get an Origin cursor. Frame the rectangle to the desired size and release the mouse button.

Effect The brush image is now a rectangle with your specified size and line thickness.

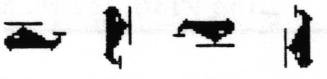
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rotate>



Concept Enables you to rotate your brush image by 90, 180, or 270 degrees. Rotation is in a clockwise direction. This option along with **mirror** allows considerable brush manipulation.

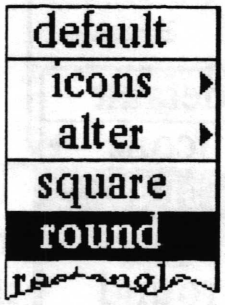
Procedure Select **alter> rotate>** from the popup menu.



Effect The brush image will be rotated and redisplayed in the Brush button.

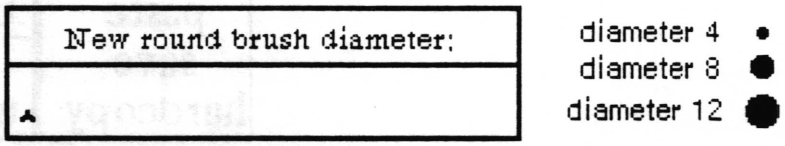
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round



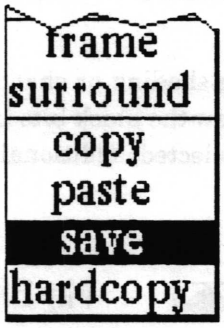
Concept Produces a solid round brush.

Procedure Select **round** from the popup menu. Specify the brush diameter in the prompter.



Effect The brush will be made a solid round image of the designated diameter.

save



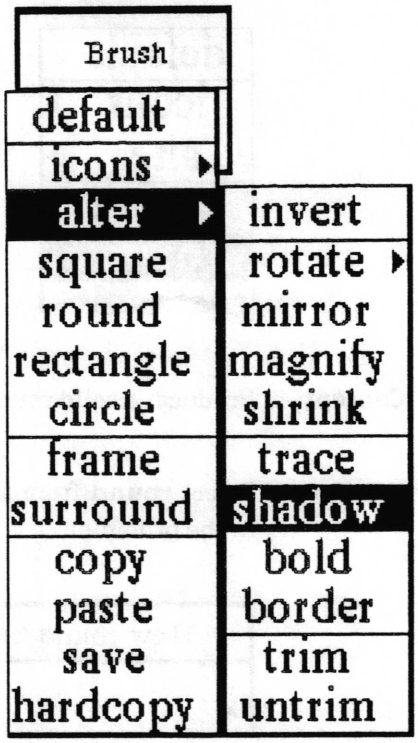
Concept Stores the brush image into an Information Center for later retrieval.

Procedure Select **save** from the popup menu. A **File request** QBox will appear requesting the necessary information to make a new image item and store it in one or more information Centers.

Effect The brush will be saved as an image item in the designated Information Center(s).

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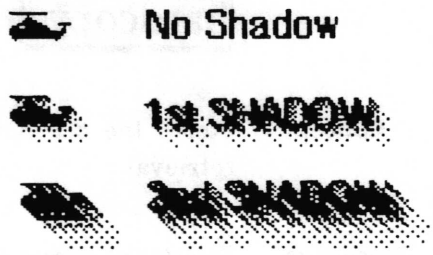
shadow



Concept Allows you to shade or shadow the brush.

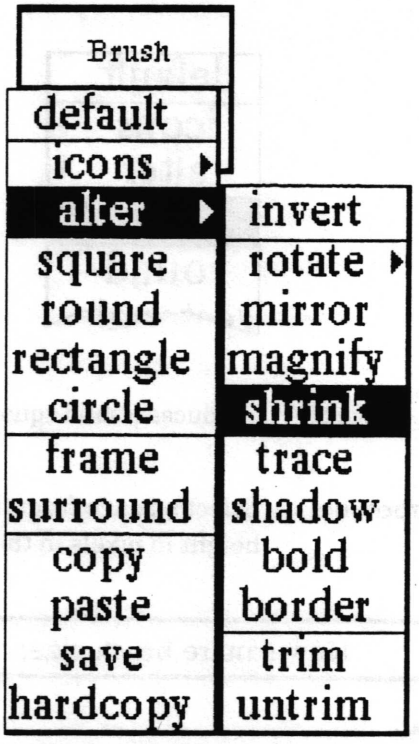
Procedure Set the contents of the Brush to the desired Color and Mode and select **alter> shadow**.

Effect The shading or shadowing pixels will be added to the right and below the black bits in the Brush. For each time **alter> shadow** is selected, additional pixels will be added to the Brush.



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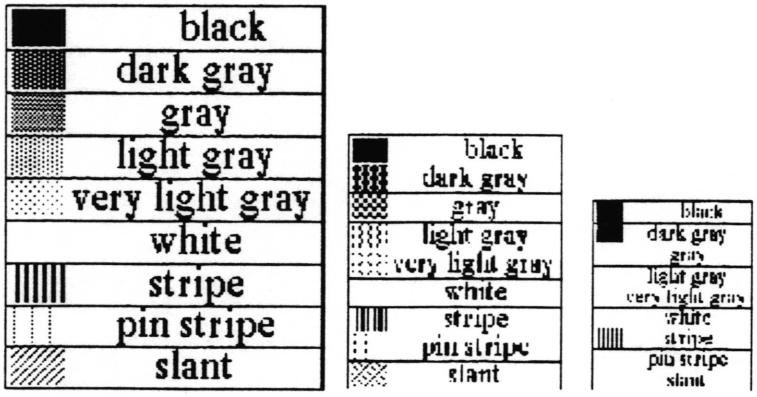
shrink



Concept Enables you to reduce the current brush image.

Procedure Select **alter> shrink** from the popup menu. As with **alter> magnify**, type the width and height reduction factors into the prompters which appear. Unlike magnify, however, the reduction factors may be decimal values.

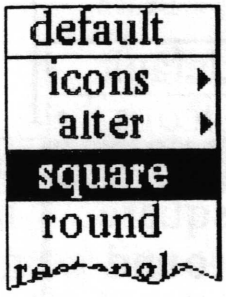
Effect The shrunken image will become the brush image.



original reduced 1.5 x 1.5 reduced 2 x 2

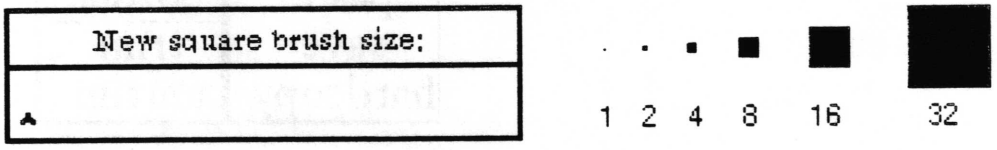
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square



Concept Produces a solid square brush.

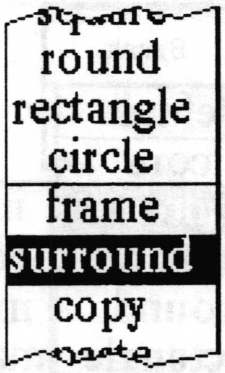
Procedure Select **square** from the popup menu. Specify the brush width and height in pixels in the prompter.



Effect The brush image becomes a solid square of the designated size.

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surround



Concept Enables you to draw around anything in the edit pane and make it your brush. Has the advantage of allowing you to make a non – rectangular shaped region the Brush.

Procedure Select **surround** from the popup menu. The cursor will become the normal system cursor. Position and press the left mouse button down when the cursor is on the edge of the area in the edit pane which you want to use for your brush. Continue to hold the left mouse button down as you move the mouse to draw around the area.



Drawing surrounding lines



Resulting brush



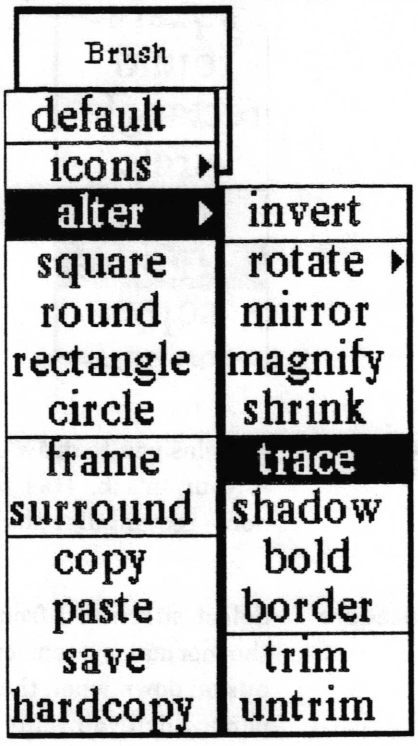
Resulting brush inverted

Effect The surrounded area becomes your brush image. If the surrounding line was not completed, you will end up with a rectangular brush of the extent of the surrounding lines. If you click outside the surrounded area, the brush will not be changed.

This resembles **frame**, but allows you to pick up irregular images that might be difficult to outline with that function. Areas outside the edit pane may also be surrounded, but part of the surrounding lines are included in the resulting brush.

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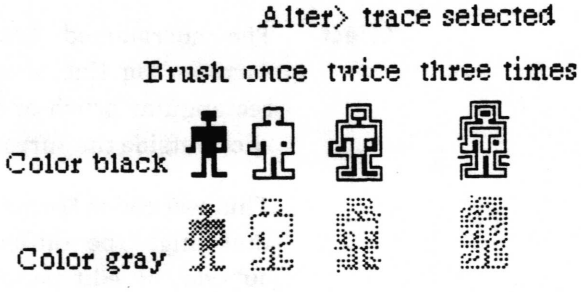
trace



Concept Draws one or more lines around the image in the Brush, creating a new brush which is just the outline.

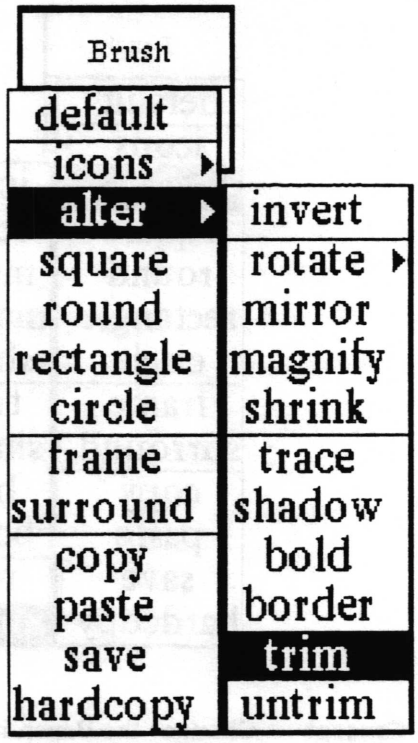
Procedure Select **alter> trace** one or more times, depending on how many lines you want drawn around the Brush image.

Effect Draws a line of one pixel in width around the image for each time **alter> trace** was selected. In the example below, the Mode is over and the Activity is draw.



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trim



Concept Allows you to remove the white space which surrounds a Brush image, creating a Brush which is opaque.

Procedure Select **alter> trim** from the menu.

Effect The new Brush image will become opaque; that is, the image in the brush will cover an image it is placed over. Also, the brush will not have white space around it. This effect can be seen by comparing the illustrations below. The Activities for which this item was designed are: draw, sketch, stamp, fill and block. The Brush **alter> border** item can also use **alter> trim**. For other Activities and Brushes, the Brush image will be automatically untrimmed, and for any Mode, this choice is irrelevant.

Untrimmed Brush, Mode over →



Untrimmed Brush, Mode under →

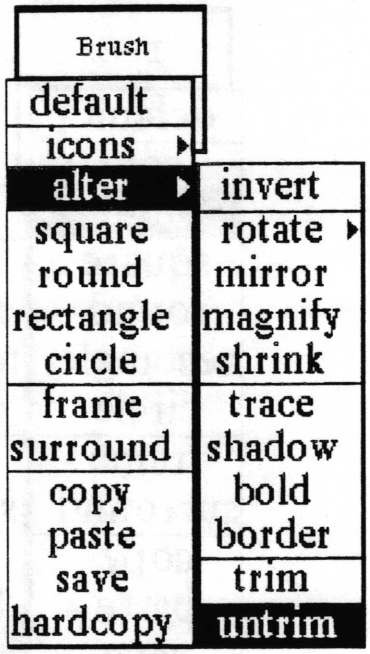


Trimmed Brush, Mode over or under →



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untrim



Concept Changes the Brush image to a normal (framed with white space) form.

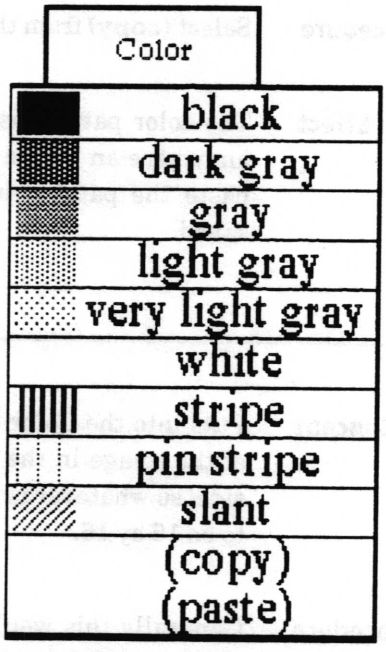
Procedure Select **alter > untrim.**

Effect Reverses the effect of **alter > trim**. See examples under **trim**.

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Color middle mouse button menu

The Color button popup menu contains the options shown.



color choice

Concept Allows various color and pattern options to be used with the brush image.

Procedure Select the desired color or pattern from the popup menu.

Effect This selection is applied to the brush image.

Besides the colors and patterns available from the menu, you may also create your own patterns using the (**copy**) and (**paste**) selections.

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(copy)

Concept Puts into the clipboard the color pattern currently in the Color button.

Procedure Select **(copy)** from the popup menu.

Effect The color pattern is put in the clipboard. It can then be pasted anywhere an image can. Generally this would be most useful to paste the pattern into the brush, where it may be altered or saved.

(paste)

Concept Puts into the Color button whatever is in the clipboard. The size of the image in the Color button is a square area 16 pixels on a side, so whatever is pasted will be clipped (truncated) or expanded to be 16 by 16.

Procedure Generally this would be used after copying a desired pattern in the brush. Select **(paste)** in the middle button menu of the Color button and the new pattern will appear in the button.

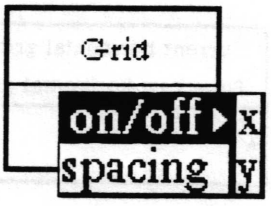
For example, select a pattern such as the *vertical stripes* from the Color button menu, then select **(copy)** from the same menu. This puts the pattern into the clipboard. Next go over to the Brush button menu and select **paste**. The pattern is now in the brush. Modify the Brush by using the **alter> rotate** selection to rotate the pattern 90 degrees. Now select **copy**. The modified pattern (horizontal stripes), is now in the clipboard. Go back to the Color button and select **(paste)**. The modified pattern is now a "color" you can paint with. You can select **block** from the Activity button menu and cover the entire image area with the modified pattern.

Another idea is to draw your own pattern on the screen and then frame it with the Brush. Select **copy** while in Brush and then select **(paste)** from the Color button.

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Grid middle mouse button menu

The Grid button popup options are used for accurate cursor positioning in the edit pane. It is especially useful when trying to line things up. The grid does not appear in the editing pane, but its presence will be apparent as you move the cursor.



on/off>

Concept Allows turning gridding on or off for both axes at once or each axis independently.

Procedure This feature works like a toggle switch. If you select **on/off>**, the state of both axes will be switched from *off* to *on*, or *on* to *off*. If you select **on/off> x**, the state of the x (horizontal) axis will be toggled. If you select **on/off> y**, the state of the y (vertical) axis will be toggled.

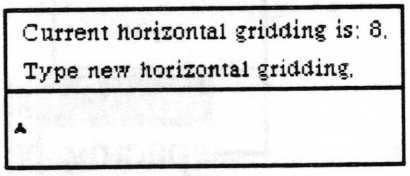
Effect When gridding is *off* it really means the spacing value is 1, and thus every bit (pixel) is accessible. When gridding is *on*, cursor movement (and thus application of the brush) in the edit pane will be restricted to bits (pixels) which are some multiple of the spacing factor apart. The grid cannot be seen in the edit pane, but it can be felt when it is turned on and you attempt to place the brush somewhere within the pane. Turning the Grid on is most useful when trying to line things up.

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spacing

Concept Allows setting the spacing for the x and y axes.

Procedure Select **spacing** from the popup menu. A Prompter will appear for each active grid axis.



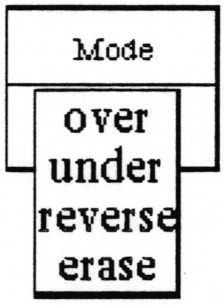
Type a whole number followed by a carriage return in each Prompter. When either gridding axis is *on*, the corresponding spacing value will be shown next to it in the Grid button.

Effect When gridding is *on* for an axis, cursor movement (and thus application of the brush) in the edit pane will be restricted to bits (pixels) which are a multiple of the spacing factor apart.

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Mode middle mouse button menu

This function determines the method in which the brush image is applied to image in the sketch in the edit pane. The current mode state is displayed in the lower part of the mode button. The default state of Mode is *over*.

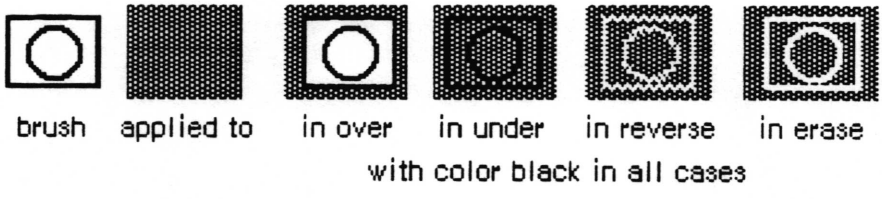


over When this mode is set, the total brush image (both white and black bits) will be set on the image whenever the brush is applied to it. In other words, the brush image is applied opaquely, covering everything underneath it.

under When this mode is set, only the *black* bits in the brush will affect the image. When the brush is applied to the image, any bit beneath a black bit in the brush will become black. This will give the effect of merging the brush image with the sketch image.

reverse When this mode is set, only the *black* bits of the brush will affect the image. The *black* bits in the brush will set the black bits in the image under the brush white, and will set the white bits in the image under the brush black. The *white* bits in the brush will have no effect on the image.

erase When this mode is set, only the *black* bits in the brush form will affect the image. The *black* bits in the brush will set the black bits on the sketch image to white, thus erasing those parts of the image. The *white* bits in the brush will have no effect on the image.



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Right mouse button menu

The right mouse button in the Sketch Editor window brings up the standard window popup menu fully described in the "Analyst Window menus" subsection of the *System Interface* section of this User Guide.

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Glossary

bit The smallest unit of resolution in an image. One pixel (picture element).

brush The shape of the cursor in the edit pane which can be varied in function, size, color and method of application. Used to create and edit pictures in the edit pane.

button pane The pane under the edit pane containing five buttons (Activity, Brush, Color, Grid, and Mode), each with its own middle mouse button menu, used to modify the brush.

default A setting or value used for a starting or reference point. The default brush is a square with a four pixel width.

edit pane That part of the window where an image or sketch is viewed and edited.

erase To make part or all of the bits of an image white.
A Mode button setting which causes the black bits of the brush turn the bits white in the image where it is applied.
An editing pane menu selection which may be used to change the entire image to white bits.

fill A color or pattern occupying an enclosed area such as a bar in a bar chart.

frame To enclose within a rectangle. A menu selection enabling areas on the screen to become the brush image.

grid The invisible x and y (horizontal and vertical) axes in the edit pane which can be used to position images with more accuracy. Can be turned on or off and have axes set through the Grid button.

icon A special shape or symbol used for identification.
A Brush button menu option providing access to a list of icons.

invert To change the bits in an image such that all black bits become white and all white bits become black.

over A Mode button setting which causes the brush to be applied opaquely.

pixel A picture element. The smallest unit of resolution in an image. One bit.

reverse A Mode button setting in which the black bits in the brush invert (reverse) the sense of the bits in the image where it is applied.

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rotate To turn about an axis or center. A Brush button menu option which allows clockwise rotation by 90, 180, or 270 degrees.

spacing The distance in pixels between grid lines.

spline A line or curve passing through a series of points. An Activity button menu option which causes the brush to be moved through a series of points defined by the user.

surround To enclose on all sides. A Brush button menu option for defining a new brush by drawing a line surrounding the bits to be used.

symbol A shape used for identification.
A Brush button menu option providing access to a list of symbols.

text pane The window pane directly below the title tab where you may type and edit text.

title tab Attached to the top left corner of a window, it displays a name identifying the information displayed in the window.

under A Mode button setting which causes only the black bits in the brush to be applied. This gives the effect of merging the brush with the existing image.

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Spreadsheet

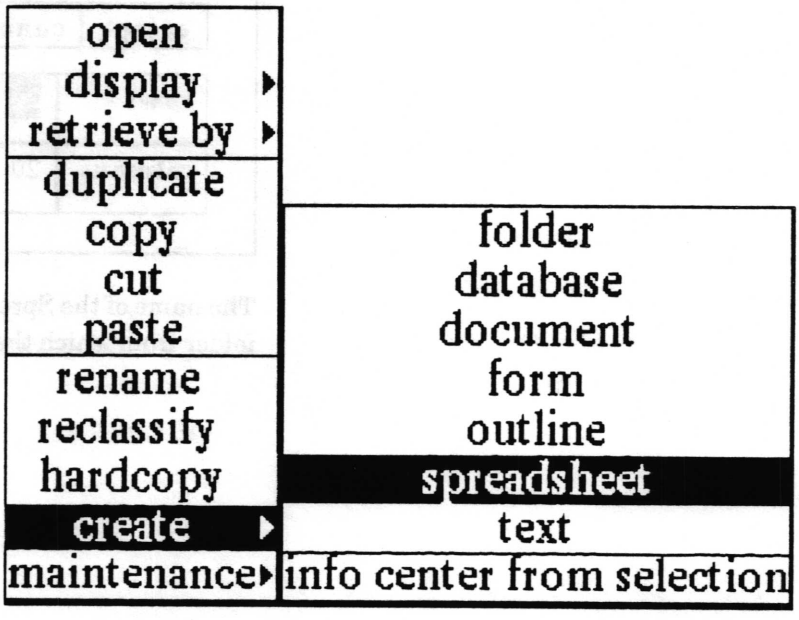
A Spreadsheet is a modeling tool for exploring different types of "what–if" scenarios by referencing a variety of databases. Spreadsheets are used for data analysis, and can include charts, truth tables, and image processing.

A Spreadsheet is arranged as a two–dimensional array of cells indexed by row and column. Cells contain values that can be computed dynamically from user – specified rules that may reference values from other cells. Spreadsheets in The Analyst can, in addition, be linked together to form powerful distributed Spreadsheets.

Each cell of a Spreadsheet can hold any Smalltalk–80 object, including images, databases, popup menus, and files. New functionality added to the software system is automatically accessible by Spreadsheets without modification to the Spreadsheet application software.

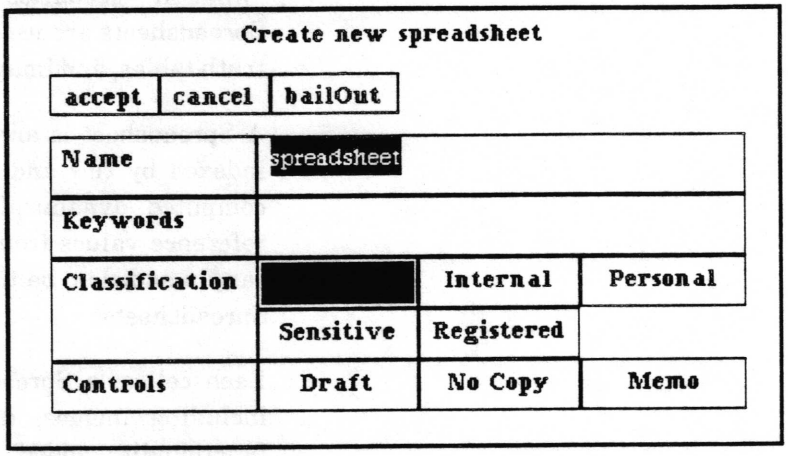
Creating a Spreadsheet

Creating a Spreadsheet is done from any Information Center folder using select **create> spreadsheet** from the folder middle mouse button menu.

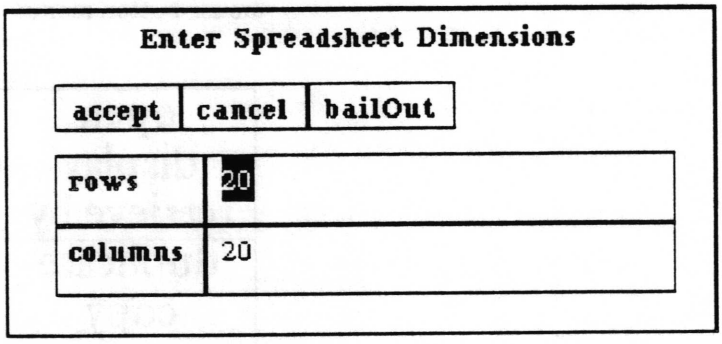


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A **Create new spreadsheet** QBox appears, into which you will enter in the name, any key words, and classification for the new spreadsheet. After selecting **accept**, the new Spreadsheet name will appear in the Information Center from which it was created.



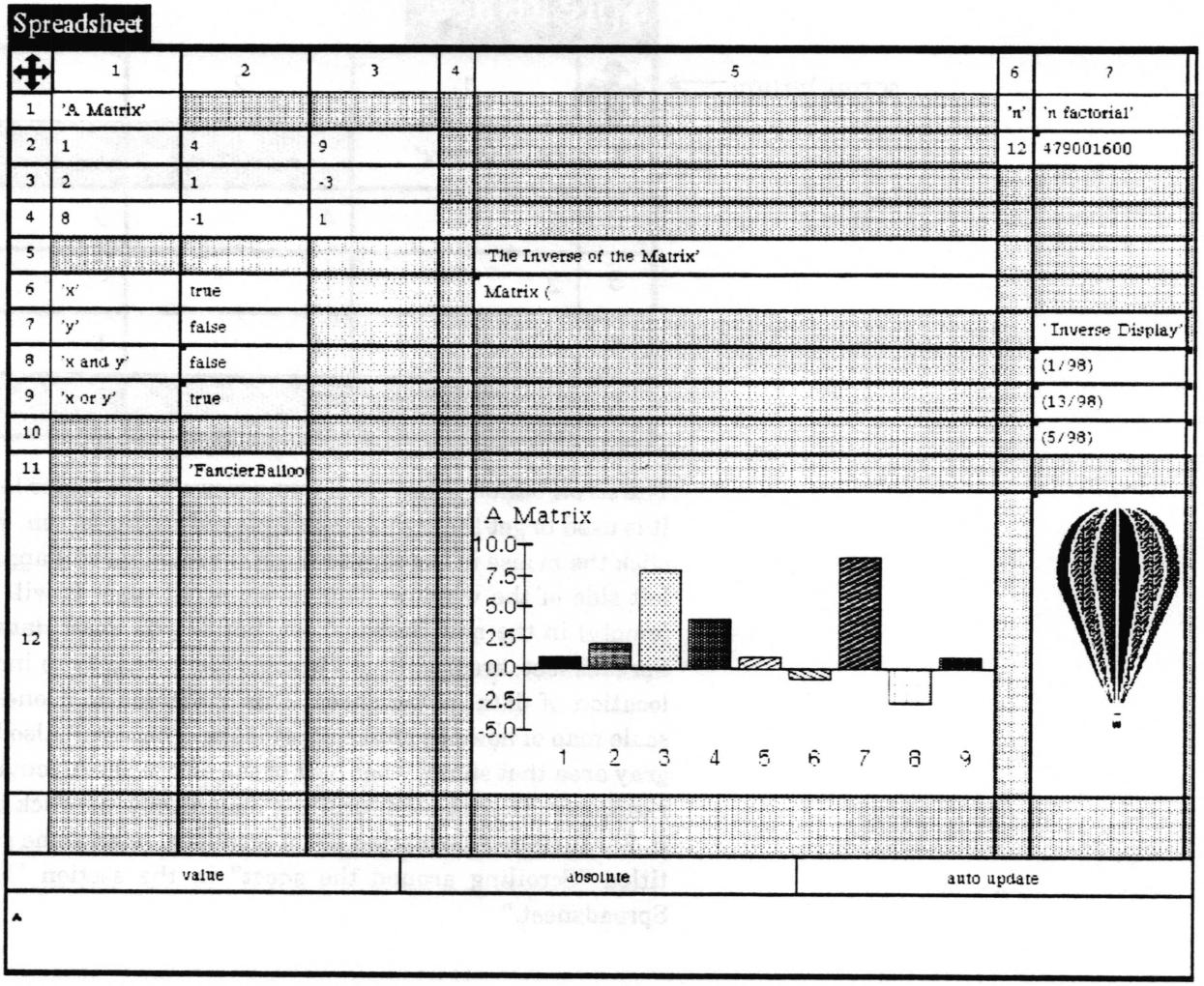
A QBox called **Enter Spreadsheet Dimensions** will appear to allow you to specify the intended number of horizontal rows and vertical columns. The default Spreadsheet has 20 rows and 20 columns. Although rows or columns can be added to the Spreadsheet after its creation, they cannot be deleted. Select **accept** and the Origin cursor prompts you to frame and open the new Spreadsheet window.



The name of the Spreadsheet and this icon  will be filed in the folder from which the create request came.

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Spreadsheet window layout



title tab

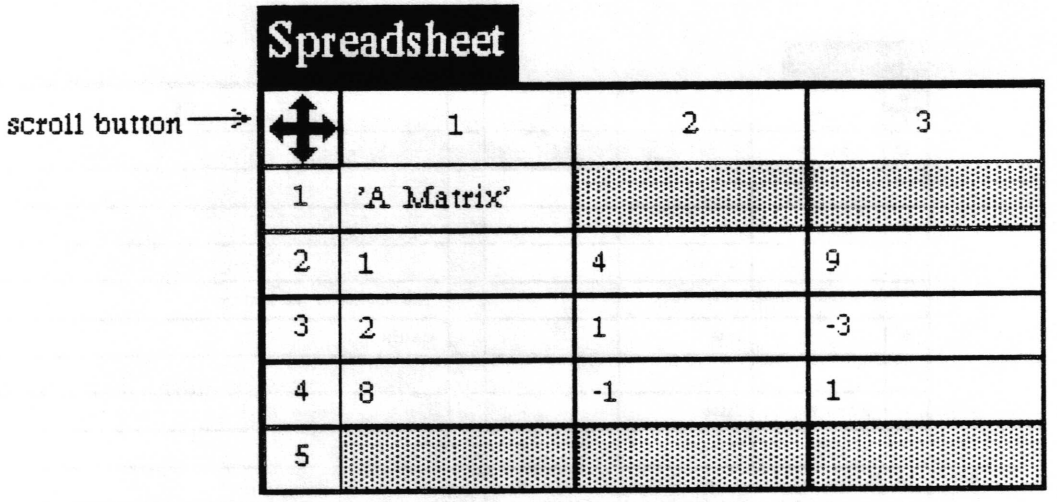
A *title tab* extends above the top left corner of the window. It contains the name of the Spreadsheet as entered in the Information Center.

classification bars (not shown)

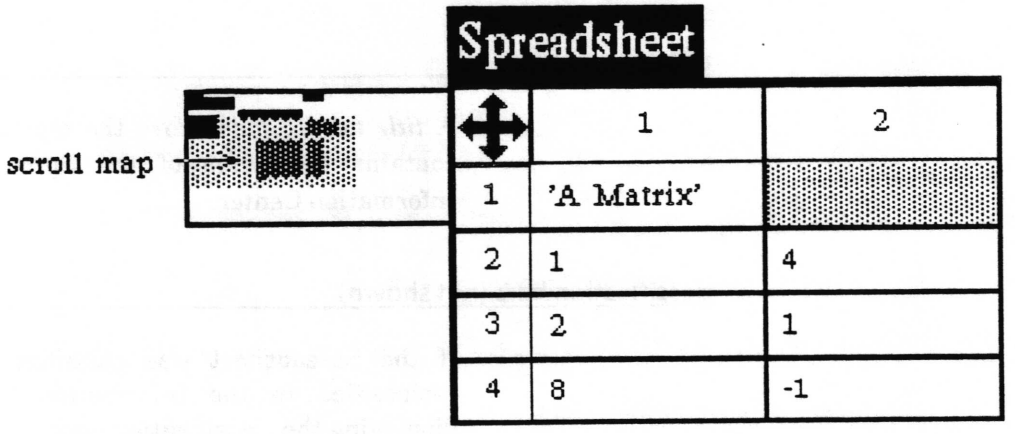
If the Spreadsheet was classified when it was created, or reclassified in the Information Center, a rectangular bar displaying the classification appears at the top and bottom of the window. The *classification bars* are highlighted in reverse video whenever the window is active.

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scroll button and scroll map

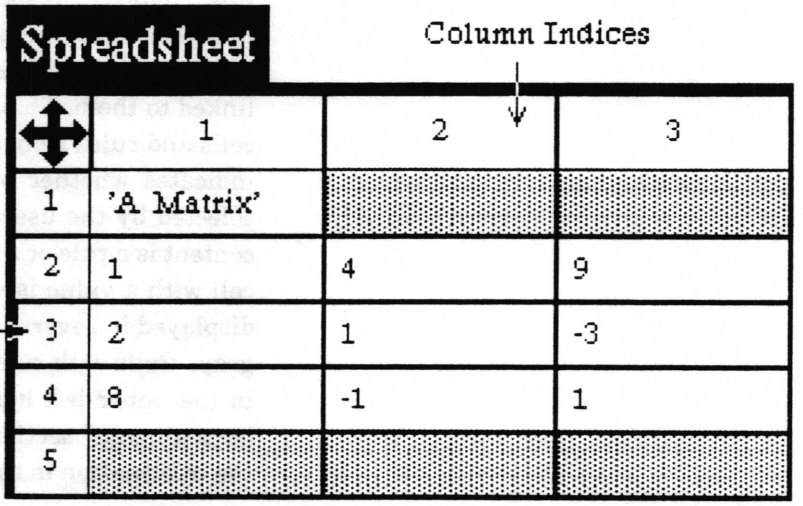


The *scroll button* is the set of four arrows in the upper left corner. It is used to get the *scroll map* displayed on the screen. When you click the mouse in the scroll button, a rectangle will appear to the left side of the window. This is the scroll map. It will be white (empty) in the new Spreadsheet, but as you enter data into the Spreadsheet, areas of it will become black or gray to indicate the location of data in the sheet. This rectangle is a one-fifteenth scale map of how the entire sheet looks. There will also be a light gray area that shows what part of the entire sheet you are seeing right now. To make the scrolling map disappear, click outside of it. For further information about scrolling, refer to the subsection titled "Scrolling around the sheet" in the section "Using the Spreadsheet."



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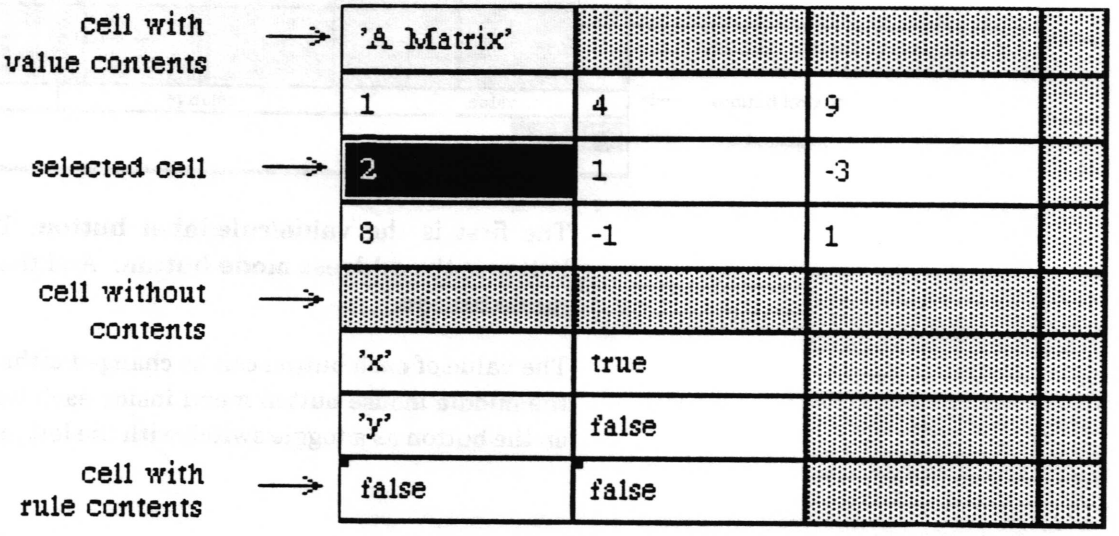
row and column indices



The *row and column indices* or axes are each a sequence of boxes with heavy boundaries on the top and left sides, containing numbers in sequence starting from 1 for each row and column contained in the Spreadsheet. All rules reference other cells by these row and column indices.

The indices give you a convenient reference as to where you are in the sheet. A reference is required when you want to add rows or columns in the middle of the Spreadsheet. The index boxes start at Row 1 and Column 1, and grow larger numerically as you go towards the right and the bottom. They are also used for selecting or changing the shape of a row or column by placing the cursor on the boundary lines separating one index from the next and "sliding" the boundary line.

cells



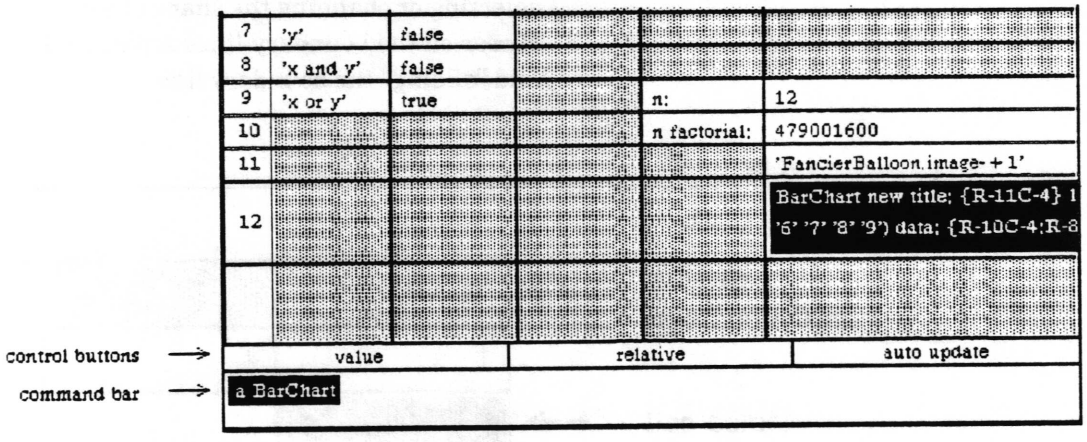
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Cells (which are blank or without contents in a new Spreadsheet) are located immediately under and to the right of the column and row indices respectively. This is where most of the user–interface of Spreadsheets lies, as you point at cells and change their rules and values, updating other cells which are linked to them. This is also where you can **copy**, **cut**, and **paste** cells and rules from one place to another. The shading of the cell indicates whether or not the cell has contents, if it has been selected by the user for some operation, and whether or not its content is a rule or a value. Notice in the illustration above that a cell with a value is white with black lettering. A selected cell is displayed in reverse video. An unselected cell without contents is gray. Cells with rules assigned to them display a small black box in the upper left hand corner. Refer to the "Cell middle mouse button menu" section for complete information on manipulating the information in the cells.

Cells can contain almost any Smalltalk–80 object, from simple numbers to charts, graphs, vectors, files, and matrices. Entire databases can be kept in cells, allowing you to both query and analyze them from within a Spreadsheet.

control buttons

Under the cells are three rectangular boxes called *control buttons* which are set to the default words "value", "relative" and "auto update".



The first is the **value/rule/label button**. The middle control button is the **address mode button**. And the last is the **update mode button**.

The value of each button can be changed either by selecting from the middle mouse button menu inside each button or by clicking on the button as a toggle switch with the left mouse button.

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value/rule/label button

This button controls the **value**, **rule**, or **label** options. Every cell has three parts:

- a *value* the information it holds,
- a *rule* how it relates to other cells,
- a *label* description of the cell or Spreadsheet.

The value/rule/label choices tell the Spreadsheet which part to display in the command bar, or which part is being edited in the command bar.

A cell can have as its contents any of these three options alone, or a rule and value can be contained in a single cell. Note that once a cell contains a label, it *cannot* also contain a value (and there is not much purpose in assigning a rule to a cell which has a label as its contents).

address mode button

This button controls the options **relative** and **absolute**.

To better understand the address mode button, you will need to read about what cell rules are, and how the cells refer to each other. Basically, cells can talk about one another in two different ways; that is, "absolutely" and "relatively." This button tells the system which way to do it when it is asked to name a cell. Refer to the subsection "Cell reference" in the "Rules" section of this chapter.

update mode button

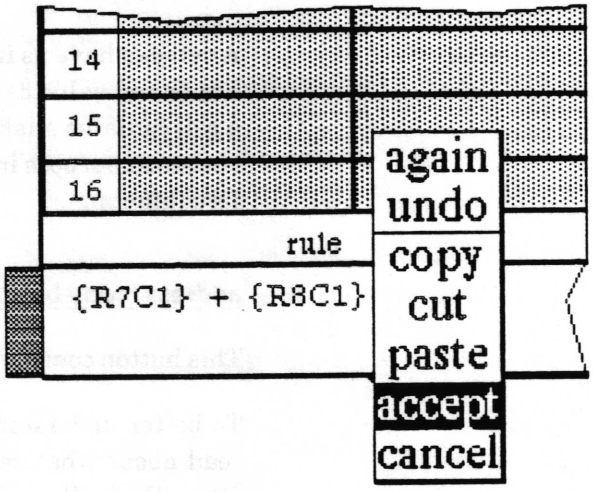
This button tells the system whether you want everything to update as soon as any value is entered, or to save all of the updates until you have finished entering new values and editing the Spreadsheet. It is an advantage to be able to save all updates until the desired changes in the Spreadsheet have been made, since the Analyst software cannot update everything on a Spreadsheet instantly, especially if it is complicated.

The update mode button toggles the state of the system between **auto update** and **no updates**. If the system is currently on **no updates**, it will save information until the system is set back to **auto update**, then it will update everything at that point.

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command bar

The *command bar*, at the very bottom of the Spreadsheet window is used for displaying, specifying, and editing the value, rule and label of the selected cell. It is very much like a Simple Text window in that you can use the middle mouse button popup menu for editing text. Please refer to the *Simple Text* section of this manual for more details if you are unfamiliar with these menu items.



command bar middle mouse button menu

The menu consists of the following options:

again Repeats the last **copy** or **cut** edit action.

undo Reverses the effects of the last command. For instance, if text has been deleted, **undo** will put it back in.

copy Puts a copy of the currently selected text into the clipboard.

cut Deletes the currently selected text and puts it into the clipboard.

paste Inserts, at the current selection, whatever information is currently in the clipboard.

accept Puts the value, rule or label into the cell, depending upon how the rule/value/label button is currently set.

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Error checking is performed as well. For example, if the value button had been selected and an invalid value were typed in, a Confirmer would ask you if you intended this to be a rule:

Illegal Value -- would you like to accept as Rule?	
yes	no

Or conversely, if the rule button had been selected and an invalid rule were typed in, a Confirmer would ask you if you intended this to be a Value:

Illegal Rule -- would you like to accept as Value?	
yes	no

cancel Sets the contents of the command bar back to what it was after the last **accept** was used.

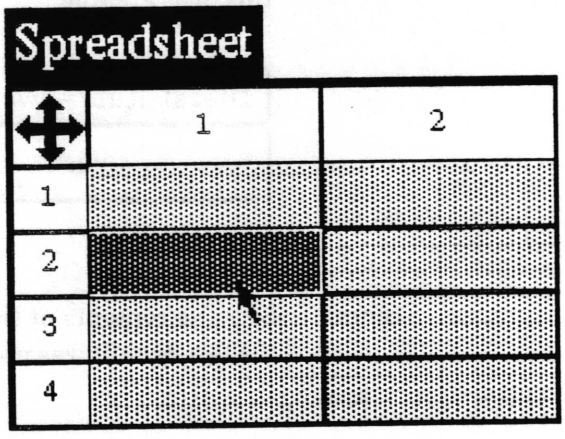
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Using the spreadsheet

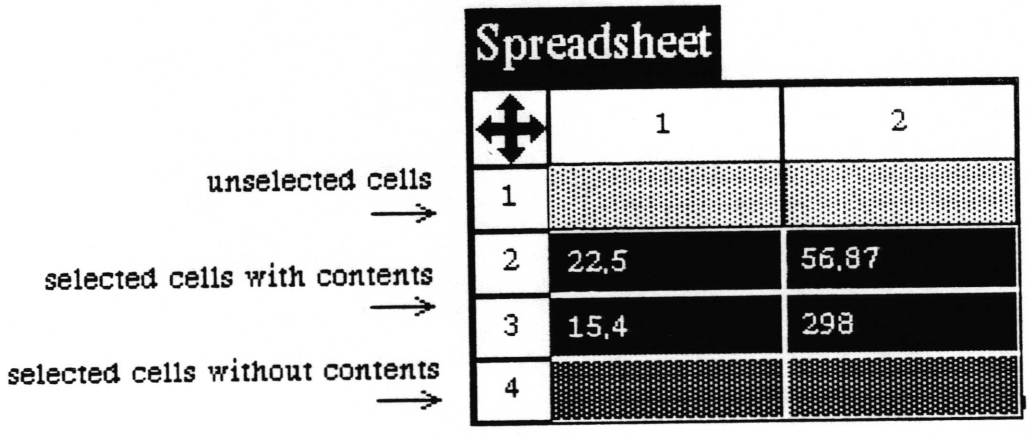
After becoming familiar with the Spreadsheet window layout, the next step is to learn how to manipulate it.

Selecting a cell

A cell or group of cells must first be selected before you can do anything to them, such as adding values or rules, or moving them around.



To select a single cell, place the mouse within the cell and click the left button. If the cell has no contents, it will turn a darker gray to signify that it has been selected. If the cell has contents, it will show in reverse video (white characters on a black background). The command bar will be empty (if the cell was empty), or some value will appear (if the cell had contents).



You can also select an adjacent group of cells. To do this, find the upper left (or lower right) corner of the group to be selected, press the left mouse button, and drag the cursor to the bottom right (or

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upper left) corner of the last cell in thr group you want to select. Release the mouse button. It is an action like framing a window.

A group can also be selected by beginning at the lower right corner of the cell of the group and moving the cursor to the upper left corner, or you may select vertically from top to bottom or horizontally from left to right.

Updating a cell

Double clicking the left mouse button on a cell will force an update of the value of the cell. This feature is useful for cells which initiate user queries. Alternatively, you may select the cell and select **update** from the cell's middle mouse button menu.

Opening items linked to cells

If the cell contains an Information Center item (such as a database or a picture), double clicking the left mouse button will open the item.

Selecting an entire row or column

An entire row or column can be selected by clicking the left mouse button over the row or column index. If it is already selected, it can be deselected by clicking over the index. Multiple rows or columns may be selected by pressing down the left mouse button over the index of the first index, moving to the last index, and then releasing the mouse button.

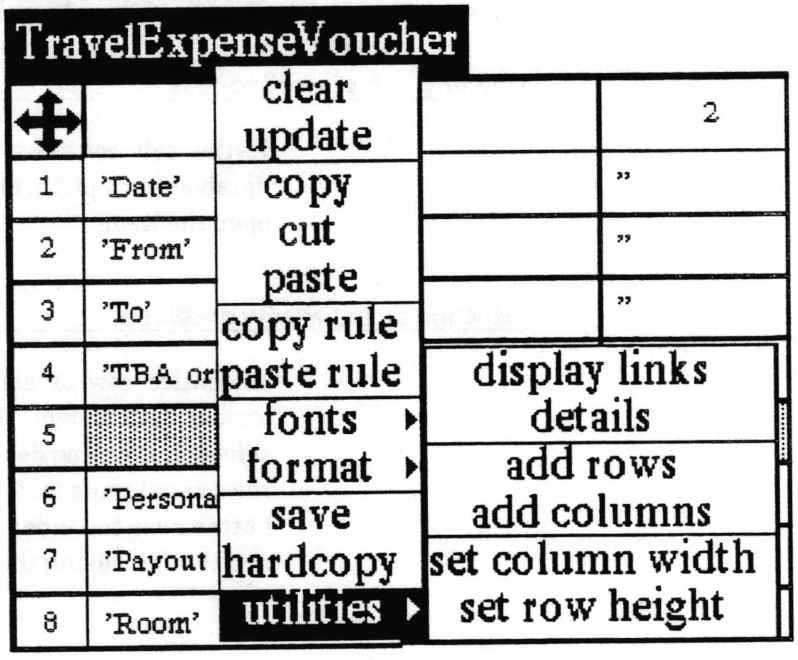
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Changing row or column size

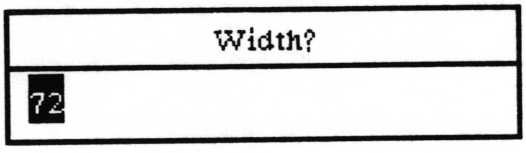
There are 2 ways to change the height of a row or width of a column.

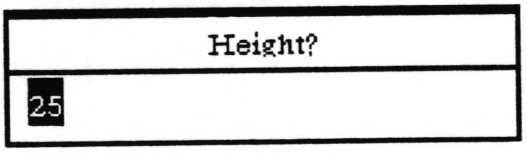
cell middle mouse button menu

The cell's middle mouse button items **utilities> set column width** and **utilities> set row height** can be used to specify the width and height in pixels. Refer to the "Cell middle mouse button menu" section of this document for complete details on **set column width** and **set row height**.



After selecting either **set column width** or **set row height** from the menu one of the following two prompters will appear, asking the new width or height in pixels.

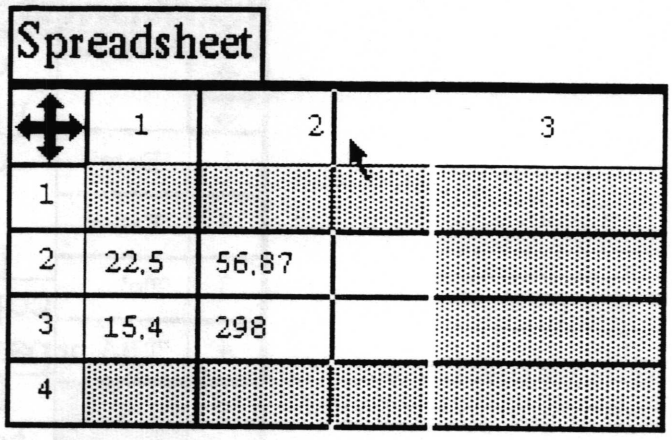




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row and column indices

The height and width can also be changed by using the horizontal and vertical lines (cell boundaries) which deliniate rows and columns. They are accessible through the row and column indices along the left side and at the top of the sheet.



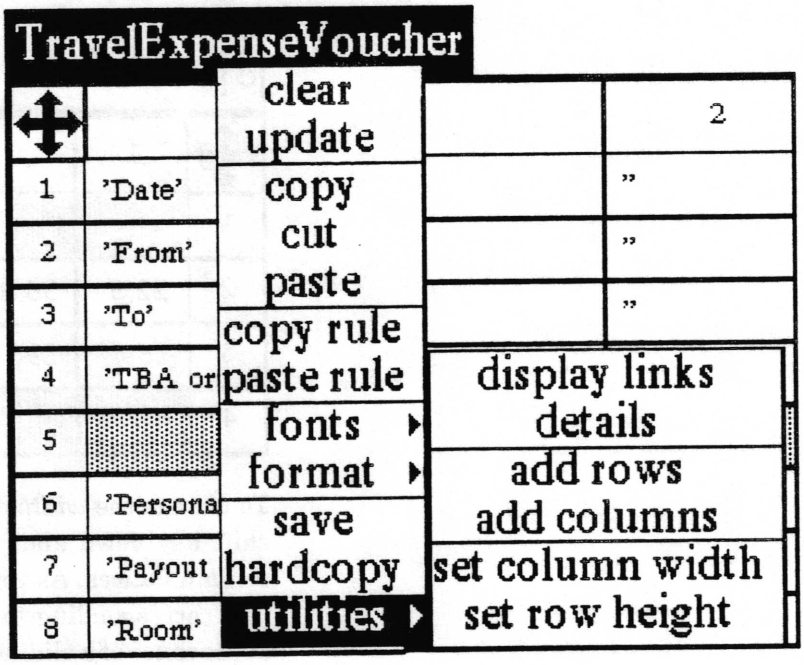
To change the *width* of a column (as shown above), hold the Left shift key down and press the left mouse button in one of the column indices. As you move the cursor left or right, the vertical line corresponding to the column will move with it; it has the appearance of a sliding bar. You cannot make the column smaller than 20 pixels on a 72 pixel per inch display, or about one-third of an inch. When you release the mouse button, the Spreadsheet will redisplay itself to match the new width.

To change the *height* of a row, hold the Left shift key down and press the left mouse button in one of the row indices. As you move the cursor up or down, the horizontal line corresponding to that row will move with it – it has the appearance of a sliding bar. You cannot make the row shorter than 20 pixels on a 72 pixel per inch display, or about one-third of an inch. When you release the mouse button, the Spreadsheet will redisplay itself to match the new height.

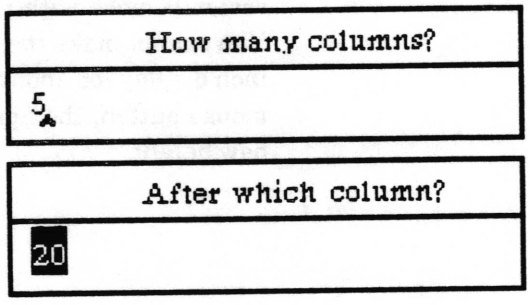
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Adding rows or columns

If you want to change the number of a rows or columns in an existing Spreadsheet, you can use the **add rows** or **add columns** from the **utilities>** branch of the cell middle button menu.



After selecting either **add rows** or **add columns** from the menu the following two Prompters will appear. The first asking for how many rows or columns you want to add and the second asking after what existing row or column you want to insert the new rows or columns.

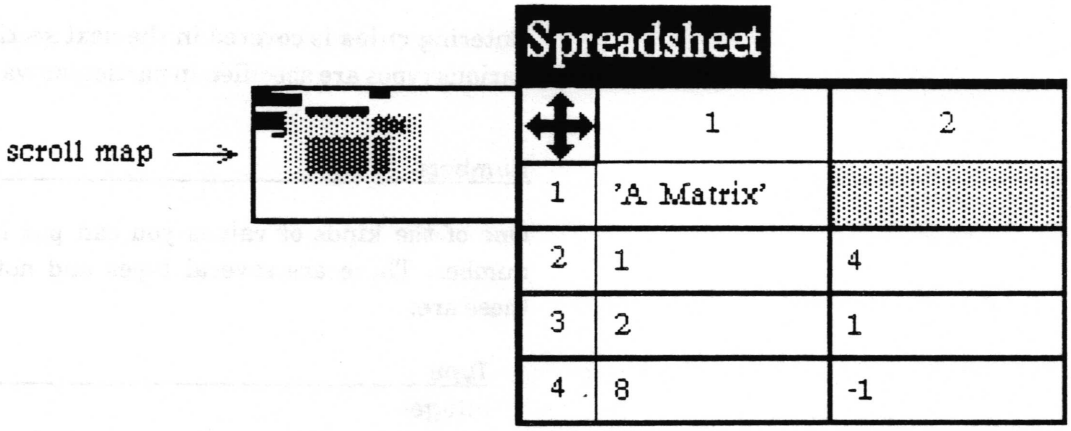


Note: After the addition of rows or columns into the middle of an existing Spreadsheet it would be wise to recheck the cells referenced by all rules to insure that they are still pointing to the cells you want. A suggested way to view the intercell relationships is using the **display links** choice on the **utilities>** branch of the cell middle button menu.

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Scrolling around the sheet

Not all of the Spreadsheet may be visible in the displayed window. You can, of course, reframe it to a larger size. If the Spreadsheet is especially large or you simply want to see another part of it while keeping the same frame size, use the scroll map:



Click the left mouse button in the scroll button to make the scroll map appear. The rectangle that makes up the map represents the entire Spreadsheet, while the light gray rectangle (the window marker) within the map represents what part is visible in the window when the scroll button was clicked.

Move the window marker around by pressing and holding the left mouse button and moving it around the scroll map. When you release the mouse button, the window will redisplay itself to accommodate the new location.

At times you may want to select a group of cells that are larger than the window. In this case, if you want to keep selecting cells that are out of the window, continue dragging off the edge of the window. The window will scroll itself in order to get the desired cells onto the screen. When you eventually reach the cell you want, release the mouse button.

Entering values and labels

You will probably want to enter and change values in the cells quite often, and may want to give the cell a label to tell the user what the contents value is, without displaying it. This is done by selecting a cell, typing the desired value, and setting the **value/rule/label** button to **value** or **label**. The cursor can either be in the cells or in the command bar when you type. Once you have typed in the value, you must store it. There are three ways to do this:

- Press the <return> key, which accepts the value and moves the selection down one row.

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- Press the ESC key, which accepts the value and moves the selection right one cell.

- Selecting **accept** command from the middle mouse button popup in the command bar accepts the value but doesn't move the selection.

Entering **rules** is covered in the next section, "Rules". Values of various types are specified in particular ways.

Numbers

One of the kinds of values you can put into Spreadsheets is a number. There are several types and notations available, and these are:

Type	Examples
Integer	-3, -2, -1, 0, 1, 2, 3
Float (the real numbers)	1.1, 38.8945, 2.0, 3.14159
Fraction	(-2/3), (1/4)
Scientific notation	10e36
Pi	Float pi
Base (other than 10)	2r101, 16rFF

These numbers are entered just as displayed above in the Examples.

The mathematical functions which can operate on these numbers are listed in the subsection "More complex math functions" in this document.

Strings

Numbers are not the only kinds of values that the Spreadsheet can handle. Strings are collections of characters in sequence. They are useful for labelling areas of a sheet, giving additional information such as units of measurement, and many other similar tasks.

Strings can be specified by typing an apostrophe (') before and after the characters you want in the string. If the string needs an apostrophe inside it, use a pair of apostrophes instead. Do not use the quotation mark character, even though they may appear identical on the display. They are different characters. Here are some examples:

'This is a string!' (an ordinary string)
'here''s another' (a string with an apostrophe)

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There are ways to test and manipulate strings in the system. You will find more information on them in the subsection "String functions" under "Writing rules".

Entering other values

The Spreadsheet can handle many different kinds of objects. The following are examples of values usually arrived at by using rules. They are covered in detail in the next section.

Boolean values are values that are either **true** or **false**, and are specified by typing either the word "true" or "false." They are useful for lots of decision-making procedures, in that you can test them and decide on actions with them. This is illustrated in the section titled "If-Thens, or Doing Things Sometimes."

charts are simple business graphics that can be built into cells. They need large cells to display nicely. How to build a chart is described in the "Other Interesting Functions" subsection.

databases are the user created Analyst databases that can be placed into cells. Inserting databases into cells allows large amounts of data to be accessed from a Spreadsheet without requiring that a large number of cells be used to hold the individual values.

Information Center items such as forms or pictures, outlines, documents and so forth can be referenced from cells. Double clicking the left mouse button on the cell will open the item. Folders should *not* be placed into cells because they cannot be referenced from a cell.

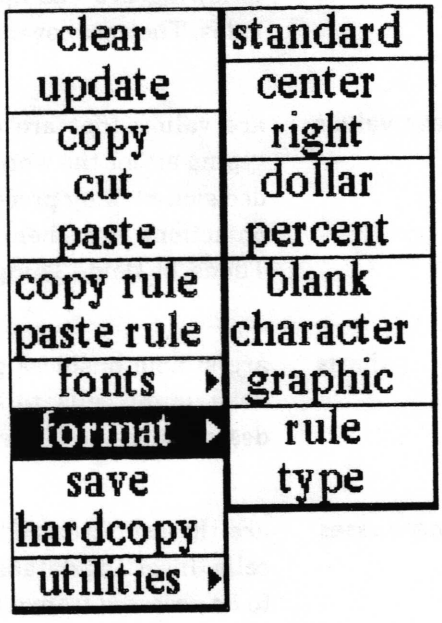
Instructions are the procedures the user of the Spreadsheet is to follow, or other helpful information. Double clicking on the cell containing Instructions pops up a Notifier containing the text which was entered as the value.

points are x–y pairs that can be treated as vectors as well. They are described in the subsection on "Other Interesting Functions." You specify them by typing a number, followed by the symbol "@," followed by a number. An example is "3@4," which means "x=3" and "y=4."

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Formatting the cells

The Spreadsheet can dislay the contents of the cells in many different formats. Some are more appropriate than others, depending on the data to be displayed. Others are simply a matter of personal taste. Formatting changes are easily applied with the cell middle mouse button menu.



Text can be centered in the cell, or left or right justified. The **dollar** format prints a number to 2 decimal places, right justifies it, and places a dollar ($) sign in front of it. The **percent** format also rounds to 2 decimal places, right justifies the number and places a percent (%) sign after it.

Blank format displays nothing in the cell, although the cell still has contents. It could be used, for example, in Spreadsheet cells containing Databases or Stats. If you wanted to hardcopy the sheet showing only the results of querying those cells, you could **blank** format the cells containing "SSDatabase" and "Stats" so that the user would see only the results printed or displayed on the sheet.

Character and **graphic** allow you to display cell contents as strings or as graphics. The **rule**, rather than the value, can be displayed in the cell. Or, you can choose to display only what **type** of contents the cell has: value, rule, or label.

For complete explanations of these **format>** menu items, refer to the alphabetical listing in the "Cell middle mouse button menu" section.

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Rules

The rule facility in Spreadsheets is complex, but very powerful. One of the major things that makes a Spreadsheet a creative tool is the ability to make the value of some cell depend on the value of another cell.

This is done by specifying a rule by which the cell can update itself whenever one of the cells it depends upon changes. The rule can be simple, such as stating that a given cell is always equal to the value of some other cell, plus one. Or it may be much more complex. With rules, you can do all sorts of useful calculations without having to learn how to program a computer.

Spreadsheet rules must follow a specific syntax which is described in the following subsections. "Cell reference" will cover several methods of how to specify the cell or cells receiving a rule. Under "Writing rules," the correct way to enter Instructions (procedures written by you for your user) are covered. In the next subsection, the simple and complex mathematical functions which can be used in rules will be listed. Following that, the functions which operate on textual material as strings are discussed. Examples for specifying the Smalltalk objects contained in the Analyst such as Charts and Databases conclude this section.

Entering rules

A rule is entered in much the same way a value is, but with the **value/rule/label** button set to **rule** and by using the popup **accept** command. The ESC or <return> keys do not work to accept rules in the command bar.

A shortcut method to use when the **value** button is turned on is to type the rule into the command bar, beginning with an equals (=) sign. Type the rule as usual, and when <return> is pressed, the system removes the equals sign and attempts to evaluate the rule. If what you have typed cannot be evaluated as a rule, it will be accepted as a value.

Cell reference

Absolute address mode

There is a simple way to refer to a cell when building a rule, using the **absolute** address mode for the cell. When the cell you want to reference can be seen on the screen, hold down the shift

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key and click the left mouse button over the cell. The reference for the desired cell will appear in the comand bar and will look something like this: {**R1C2**}. There is a similar way of selecting groups of cells, which will be discussed later.

The notation {**R1C2**} is the most basic reference that can be made concerning a cell. The "R1" stands for "row number 1," and the "C2" stands for "column number 2." Enclosed in braces in a rule, what this notation says is, "the value of the cell at row 1 and column 2." (Remember that "rows" are the horizontal bands of cells, and columns are the vertical ones, and that the indices tell you which row or column each cell is in.) This type of reference is called the **absolute** address mode, since it points at row 1 column 2 as itself.

Relative address mode

More frequently, however, you will want to reference other cells in some relationship to the cell for which the rule is being written, because of some dependency. For instance, you might want to take the values of three cells and add them together, using the sum to do something in the selected cell.

For this kind of referencing, use the **relative** address mode, which looks something like this: {**R – 3C + 2**}. It says "the value of the cell three rows up and two columns right of the cell for which this rule is written." (Remember that the row and column indices begin their numbering from the upper left corner of the Spreadsheet, so that numbers increase as you move to the right and down the sheet.) For example, if the cell for which the rule is being written has the absolute address {**R8C4**}, the cell with the relative address {**R – 3C + 2**} would be {**R5C6**}.

The notation {**R0C – 1**} points at a cell on the same row, but one column left of the cell it appears in. {**R – 1C0**} points at a cell on the same column, but one row up.

A reference may also be *mixed*. The mixed reference {**R5C + 2**} points to the cell in row 5 that is two colums to the right of this cell.

Single cell referencing without address

Instead of specifying a cell's absolute or relative address, you may simply want to say "this cell." Such a rule could then be copied elsewhere and always refer to the correct cell. {**R0C0**} is the notation for "this cell." {**R0C1**} means "this row, the cell in column 1," and {**R1C0**} means "this column, the cell in row 1."

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columnNumber and rowNumber (xcell and ycell)

Previously called xcell and ycell respectively, columnNumber and rowNumber are used to refer to the specific cell in a special way. The purpose is to reference a sequence of cells one cell at a time. These functions are used in rules operating on OrderedCollections, and in combination with simple math functions. OrderedCollections are discussed in the "Database functions in a Spreadsheet" subsection. The functions xcell and ycell can be used interchangeably with columnNumber and rowNumber in rules.

For example, consider an OrderedCollection in {R1C1} having the value '(Tom Dick Harry)'. Entering a rule into cells {R3C2}, {R3C3}, and {R3C4} which says {**R1C1**} **at: columnNumber** – 1 would look at the OrderedCollection (Tom Dick Harry), and look at what the column index number was for itself and subtract 1. The remainder would be used to find which element of the OrderedCollection to assign as the value of the cell. Upon evaluation in {R3C2}, the rule would see the cell column index 2, subtract 1, and use the remainder 1 to take the first element "Tom" as the value for the cell. The rule evaluated in {R3C3} would use the remainder 2 to insert the second element "Dick" into that cell, and {R3C4} would use the remainder 3 to insert the third element "Harry" as the value for {R3C4}.

Groups of cells

It is often necessary to work on groups of cells in a Spreadsheet. You may need to sum up all the elements in a group of cells, find the mean or standard deviation of the group, or work with a matrix of some sort.

{R1C1:R3C4} is a group reference of absolute addresses. It says "the values of the rectangular group of cells with a top left corner at R1C1 and lower right corner at R3C4." The notation {R0C0:R+5C+2} is a group reference of relative addresses. It says "the values of the group starting at this cell as the top left corner and ending with the lower right corner 5 rows down and 2 columns across." To obtain references like these automatically, do the following:

- Set the **value/rule/label** switch to **rule**, the address mode set to **absolute** or **relative**, and then select some cell.
- Hold down the shift key, press the left mouse button, and begin selecting cells in any direction from the starting cell.
- When you reach the last cell in the group you want to select, release all the buttons. The relative or absolute address of the group you selected will appear in the command bar.

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Cells on other sheets

The last major area to understand about references is how to reference cells in other sheets. This enables you to have a hierarchy of Spreadsheets. For instance, you might have a set of regional sales sheets all linked to a national sales sheet, and the national sales sheet linked to a corporate-wide balance sheet, and so on.

To reference a cell on another sheet, you simply have to put the name of the sheet, followed by a semicolon (;), into the beginning of the reference. Only absolute references can be used. For example, {**eastSales;R2C3**} and {**westSales;R1C1:R6C7**} are both valid references to other sheets. It is important that inter-sheet links go in only one direction, otherwise the effects may be rather unpredictable. Thus, if **nationalSales** depends on some information in **westSales**, **westSales** should *not* depend on any cells in **nationalSales**.

Writing rules

Following are subsections describing different kinds of rules for inserting values into cells, with lists of available functions and examples.

Instructions

A Spreadsheet can contain Instructions for the user which could provide information about reading or filling in the Spreadsheet. This on-line help is available by double clicking the left mouse button in the cell containing the Instructions.

With the **value** button toggled, and the cell which is to receive the Instructions still selected, either type the text into the command bar, or use **copy** and **paste** to bring the text into the command bar from elsewhere. Instructions must begin with the function **Instructions on:** followed by whatever text you compose entered as a string. That is, the text of the Instructions must be surrounded by single quotes. Select **accept** for the text to become the value. With the **rule** button toggled, select the cell which is to receive the Instructions and enter {**R0C0**} **display** (or some other absolute or relative address or group of cells) in the command bar. Have the rule accepted by the Spreadsheet.

For example, these instructions tell the reader which rows of an expense sheet to fill in and which ones to leave for Accounting.

Instructions on: 'Update information in rows 1 through 6 every week. Accounting will update rows 7 through 12.'

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Simple math

A travel expense voucher form is a good example of using simple math in a Spreadsheet. The rules needed to make an expense form would probably use only the four basic math operations:

+ plus
– minus
* times
/ divided by

Cell references are used in writing rules by telling them to do things like adding themselves. For instance, the rule {**R1C1**} + 1 says "make this cell's value equal to the value of the cell at row 1 column 1, plus one."

The rule always evaluates from left to right, so things may be a little different from what you are accustomed to. **1 + 3 /{R1C1}** evaluates the addition first: 4/{R1C1} and then the division. In other words, it does not evaluate to 1 + (3/{R1C1}).

Use of parentheses

Parentheses can be used to group the computations together. For example, **{R3C4} / 3 + (2 * {R – 1C + 2})**. If the cell at {R3C4} has a value of 3, and the cell at {R – 1C + 2} has a value of 8, the rule evaluates to 17. Without the parentheses, the rule evaluates to 24.

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More complex math functions

Up until now, the rules being described involved *binary* functions. A Spreadsheet can also handle *unary* functions. It's important to understand how unary functions work within rules, and how they are different from binary ones. Like binary operations, they evaluate from left to right, but they are *always* evaluated before any binary operations are done.

For instance, there is a unary function named **squared**. It multiplies a number by itself. The rule 3 + 4 **squared** evaluates to 19. If rules were always evaluated left to right without regard for evaluating unary operations first, it would have evaluated to 49: (3 + 4) squared, rather than 19, 3 + (4 squared).

There is one other type of function called the *keyword*. There may be several numbers in the operation, or only one. The thing that makes this different is the fact that it has a colon (:) in it. **raisedTo:** is a keyword message that raises one number to the power of another. Keyword operations are *always* evaluated after all the unary and binary operations.

Here is an example **2 raisedTo: 1 + 1** evaluates to 4. If things were always done left to right, it would evaluate to 3, that is, (2 raisedTo: 1) + 1. The rule evaluates to 4, or 2 raisedTo: (1 + 1) because the keyword function is performed last. Here is a more complex example: **2 + 1 negated raisedTo: 2** evaluates to 1.

Below is a list of some of the functions available in Smalltalk which can be used in Spreadsheets:

Function	Rule example	What it does
squared	33.2 squared	square
sqrt	33.2 sqrt	square root
raisedTo:	3.2 raisedTo: 8	raise to the given power
negated	1 negated	negative value
ln	33.2 ln	natural logarithm
exp	33.2 exp	exponential
log:	10 log: 3	log to the given base
sin	33.2 sin	sine of angle in radians
cos	33.2 cos	cosine in radians
tan	33.2 tan	tangent in radians
arcSin	12.8 arcSin	inverse sine
arcCos	12.8 arcCos	inverse cosine
arcTan	12.8 arcTan	inverse tangent
degreesToRadians	3 degreesToRadians	convert degrees to radians
radiansToDegrees	3 radiansToDegrees	convert radians to degrees
truncated	33.2 truncated	nearest integer less than
rounded	33.2 rounded	nearest integer
abs	33.2 abs	absolute value

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Use of parentheses

As with simple math, parentheses can be used to group together complex math functions to force evaluation in a particular order.

Group functions

Groups of cells can be treated two ways – either as simple lists, or as matrices. If you treat them as a list, then you have a set of functions for doing some statistical manipulations on them. If you treat them as a matrix, you can use some matrix manipulation functions on them. Either way, they can be very helpful in lots of different problems.

Here are some things you can do to groups:

Groups as lists:

Function	Rule example	Value returned to cell
sum	{R1C1:R3C4} sum	the sum of all the elements
mean	{R1C1:R3C4} mean	the mean of the elements
median	{R1C1:R3C4} median	the median of the elements
mode	{R1C1:R3C4} mode	the mode of the elements
standardDeviation	{R1C1:R3C4} standardDeviation	the standard deviation of all the elements

Groups as matrices:

Function	Rule example	Value returned to cell
invert	{R1C1:R3C4} invert	inverse of the matrix
determinant	{R1C1:R3C4} determinant	determinant of the matrix
*	{R1C1:R2C2} * {R2C3}	multiply by number or matrix

String functions

Strings can be treated in several different ways. When you write rules concerning strings, you can treat each one as a sequence of characters, or as one whole string. For instance, you can ask a string what character is at a given spot, how long the string is, or whether it contains some other string or character. You can paste them together, or operate on small sections of them.

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Here are some of the functions and the values returned to the cell:

Function	What it does
,	put strings together
at:	character at a position
copyFrom:to:	get part of a string
indexOf:	position of a character
size	size of a string
findString:startingAt:	position of a string

Here are some examples using the string "two".

Function	Rule example	Value returned
,	'two',' parts'	'two parts'
at:	'two' at: 2	$w
copyFrom:to:	'two' copyFrom: 2 to: 3	'wo'
indexOf:	'two' indexOf: $o	3
size	'two' size	3
findString:startingAt:	'two' findString:'w' startingAt: 1	2

And some additional functions and examples:

Function	Rule example	Value returned
acronym	'Office of Management and Budget' acronym	'OMB'
asUppercase	'Hi There' asUppercase	'HI THERE'
asLowercase	'Hi There' asLowercase	'hi there'
contractTo: *number*	'antidisestablishmentarianism' contractTo: 10	'anti...ism'
stripLeadingAndTrailingBlanks	' hello . ' stripLeadingAndTrailingBlanks	'hello .'
copyUpTo:	'hi there' copyUpTo: $t	'hi '
match:	'xyz' match: 'Xyz'	true
match:	'x#z' match: 'x@z'	true
match:	'x*z' match: 'x whyNot? z'	true
match:	'*x' match: 'xx'	true

Functions for arrays or collections

Arrays or collections may contain either numbers or strings. The array made from a Database is called an OrderedCollection and is discussed later in this section. Here are some functions which operate on any kind of array, for example, the collection of numbers specified as "#(1 2 3)" as a value of the cell {R1C1}.

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Function	Rule example	Value returned
select:	{R1C1} select: [:x | x < 3]	(1 2)
collect:	{R1C1} collect: [:x | x + 1]	(2 3 4)
reject:	{R1C1} reject: [:x | x < 2]	(2 3)
detect:	{R2C2}#(1 2 4 6 8) detect: [:x | x even]	2
isEmpty	{R1C1} isEmpty	false
includes:	{R1C1} includes: 3	true
asSortedCollection	{R3C3}.#(1 2 3 1 5 1 1) asSet asSortedCollection asArray	(1 2 3 5)

If-thens, or doing things sometimes

There are times when you want to specify things to be done only under certain conditions. This is often called an "if–then" construct. It allows an action to be taken only if some condition is true. In the Analyst, the way to specify this is with the "ifTrue:ifFalse:" construction. Here is an example:

{R1C1} = {R2C3} ifTrue: ['hello'] ifFalse: ['goodbye']

What it says is that if {R1C1} is equal to {R2C3}, then the value of the cell containing this rule is "hello," otherwise it is "goodbye."

There are several additional tests you can apply to the values of cells. Below is a list of operands in addition to equal:

=	equal
>	greater than
> =	greater than or equal to
<	less than
< =	less than or equal to
~ =	is not equal

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User interface functions

Cells can also contain rules which will popup menus or Prompters for the user, so that the user enter can some value to the cell.

A simple rule which brings up a popup menu when the user double clicks on the cell, and then inserts the choice made into the cell would be:

{R1C1} PopupMenu on: #('choice one' 'choice two' 'choice three') title: 'Make a choice'

Another rule making use of Smalltalk methods is the following, which asks the user to confirm the default date or time to be inserted into a cell whenever cells in a particular group are updated. The cell containing this rule is not in the range specified in the rule.

{R11C1:R11C8}. (User request: 'What date?' default: Date today printString) asDate

Note: the period after the cell reference means "when updated."

Date and time functions

Following are date and time functions which could be used in rules for the user interface, to assign values to a cell when something is updated, or to count.

Function	Rule example	Value returned
asDate	{R1C1}. '29 – MAR – 60' asDate + 30	28 April 1960
daysInMonth	{R1C1}. '1 January 1960' asDate daysInMonth	31
daysInYear	{R1C1}. 'January 1, 1960' asDate daysInYear	366
daysLeftInYear	{R1C1}. 'Jan. 1, 1960' asDate daysLeftInYear	365
previous: 1960	{R1C1}. '31 March 1960' asDate previous: #Tuesday	29 March
weekday	{R1C1}. '3/29/60' asDate weekday	Tuesday
asTime	{R1C1}. '15:30' asTime	3:30:00 pm
addTime	{R1C1}. '15:30' asTime addTime: '3:50' asTime	7:20:00 pm
subtractDate	{R1C1}. '29 – MAR – 60' asDate subtractDate: '1 Feb 1960' asDate	57
subtractTime	{R1C1}. '15:30' asTime subtractTime: '3:50' asTime	11:40:00 am

Other interesting functions

Besides mathematical functions, functions which work on strings, and the use of if–then constructs, there are other functions which can be used in rules operating on various data types.

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Boolean logic Functions include logic and testing:

Function	What it does
and:	disjunctive AND
&	conjunctive AND
or:	disjunctive OR
|	conjunctive OR
xor:	exclusive OR
not	NOT
ifTrue:	if true
ifFalse:	if false

For example, **{R2C3} not** returns the opposite of {**R2C3**} if it has a Boolean value of true or false. Thus, a true becomes a false, and vice versa. If {R2C3} has any other value, an ERROR is returned by the rule.

The ifTrue:ifFalse: construct can also take a boolean and decide the value for the cell based on that outcome. For instance, if {R2C3} is the boolean true, then the following example would evaluate to "That is true."

{R2C3} ifTrue:['That is true'] ifFalse:['That is not true']

charts Often a chart will enhance the impact of a Spreadsheet. You can build a business chart into a cell using the following kinds of rules:

BarChart new title: 'My Title' labels: {some group of cells} data: {another group}

LineChart new title: 'My Title' labels: {some group of cells} data: {another group}

For example:

BarChart new title: 'Yearly Sales' labels:{R1C1:R5C1} data: {R1C2:R5C2}

forms Forms can be inserted into Spreadsheets through rules, and there are simple ways for the user to take an image from the screen and then magnify, shrink, or display it in reverse video.

Function	Value returned
Form fromUser	Origin Cursor prompts user to frame form
Form fromUser magnifyBy: 2@2	after framing, magnify by 2
deepCopy shrinkBy: 1.5@1.5	shrink the form in the cell by 1 1/2
Form fromUser reverse	display the form in reverse video
({R4C5} deepCopy magnifyBy: 2@2) reverse	take the form in R4C5, magnify it by 2, and then display it in reverse video

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points The functions you can perform on points allow you to look at the x and y value, and treat them as vectors or other things. Below are some examples:

Function	Rule example	Value returned	
x	(2@3) x	2	the x value of a point
y	(2@3) y	3	the y value of a point
r	(2@3) r	3.60555	distance of a point from 0@0
theta	(2@3) theta	0.982836	angle of a point from 0@0
=	(2@3) + (4@5)	6@8	vector addition
-	(2@3) - (4@5)	-2@-2	vector subtraction

Database functions in a Spreadsheet

Data from a database can be used in a Spreadsheet. To do this, one cell of the Spreadsheet needs to contain an "SSDataBase" object that references the database. To make this object, select the database item in an Information Center folder and **copy** it. Then go to the cell in the Spreadsheet and select **paste**. You should see a value appear that looks something like "SSDataBase on: 'mydatabase.db - +1'.

In the examples below, {R1C1} is a reference to the cell containing an SSDatabase object as its value. The Database functions used here are the Smalltalk functions used in the Analyst's Database tool.

Function	Rule example	Value returned to cell
fieldNames	{R1C1} fieldNames	the names of the fields in this database
getFieldName	{R1C1} getFieldName	the field name selected from popup menu
getQuery	{R1C1} getQuery	a query string for the database
field: *#fieldname*	{R1C1} field: #Name	an OrderedCollection containing the values for field *fieldname*
field: *#fieldname* from: queryString	{R1C1} field: #Name from: 'Name contains "Joe"'	an OrderedCollection containing the values for field *fieldname* meeting the requirements of the query
	{R1C1} field: #Name from: getQuery {R1C1}	an OrderedCollection containing the values for field *fieldname* meeting the requirements of the query

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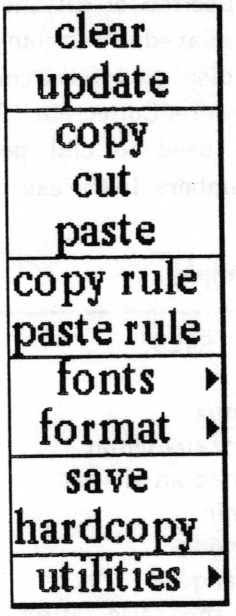
Functions for arrays of numbers

When a Database is queried from a Spreadsheet, the object returned is called an OrderedCollection. Its value is an array or collection of all the hits from the query. The value can be displayed in the command bar and the term "OrderedCollection" is displayed in the cell. In the example below, {R4C6} contains an OrderedCollection. There are several functions which can then be used to add protocols to OrderedCollections containing numbers. In the examples, {R6C7} contains a Stats object.

Functions	Rule example	Value returned to cell
Stats on: {cell}	Stats on: {R4C6}	a Stats object accessible by statistical functions
max	{R6C7} max	the range of elements in the Stats
mean	{R6C7} mean asFloat	the mean of elements in the Stats
median	{R6C7} median asFloat	the median of elements in the Stats
min	{R6C7} min	the range of elements in the Stats
mode	{R6C7} mode	the mode of elements in the Stats
range	{R6C7} range	the range of elements in the Stats
standardDeviation	{R6C7} standardDeviation	the standard deviation of elements in the Stats
sum	({R6C7} sum) + {R8C7} + {R7C7}	the sum of elements in the Stats

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Cell middle mouse button menu

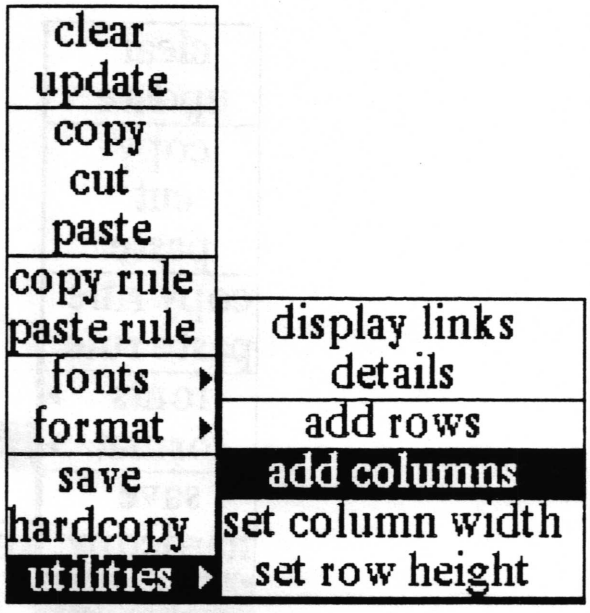


When the cursor is located anywhere within the cell area of the Spreadsheet window this mouse middle button menu is available to the user.

Following in alphabetical order is a detailed description of each of the functions available in the middle mouse button menu.

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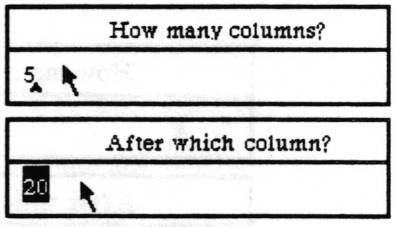
add columns



Concept Allows the addition of more columns to an existing Spreadsheet.

Procedure Select **utilities> add columns** from the cell middle button menu.

After selecting **add columns** from the menu the following two Prompters will appear. The first asks how many columns you want to add and the second asks after what existing column you want to insert the new columns.

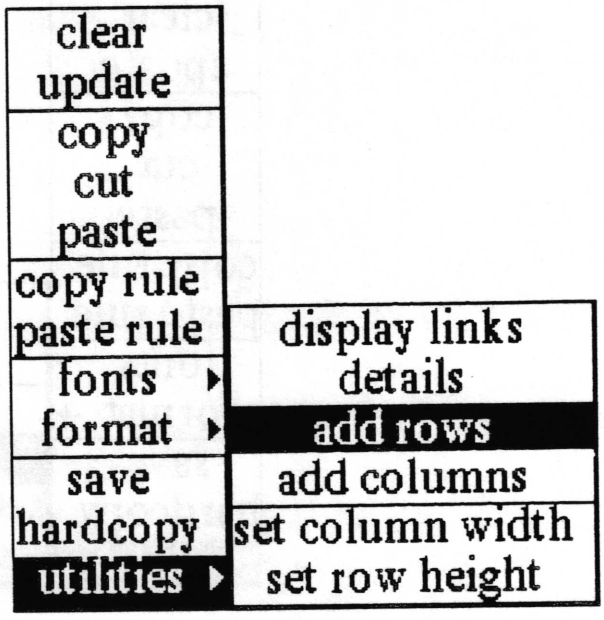


Effect The number of requested columns will be added to the Spreadsheet after the specified column. All existing columns of cells beyond the specified column will appear after the new blank columns.

Note: After the addition of new columns into the middle of an existing spreadsheet, it is suggested that you use **utilities> display links** to recheck the cells referenced by all rules to insure that they are still pointing to the cells you want.

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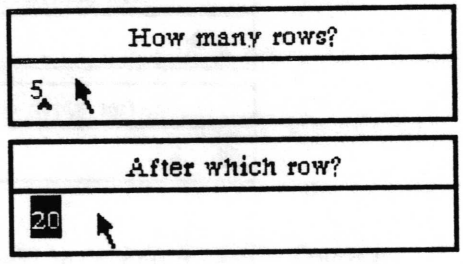
add rows



Concept Allows the addition of more rows to an existing Spreadsheet.

Procedure Select **utilities > add rows** from the cell middle button menu

After selecting **add rows** from the menu the following two Prompters will appear. The first asks how many rows you want to add and the second asks after what existing row you want to insert the new rows.

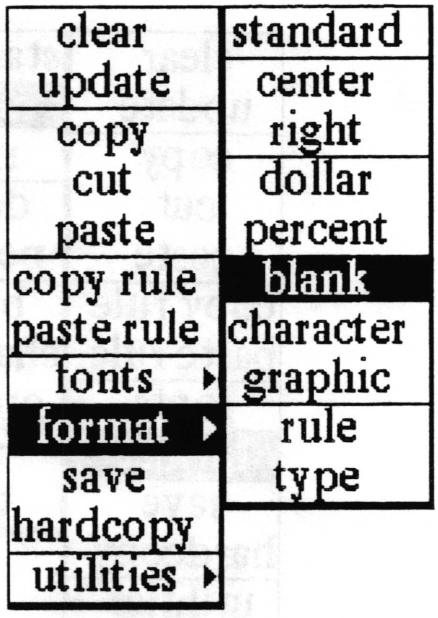


Effect The number of requested rows will be added to the Spreadsheet after the specified column. All existing rows of cells beyond the specified row will appear after the new blank rows.

Note: After the addition of new rows into the middle of an existing spreadsheet, it is suggested that you use **utilities > display links** to recheck the cells referenced by all rules to insure that they are still pointing to the cells you want.

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blank



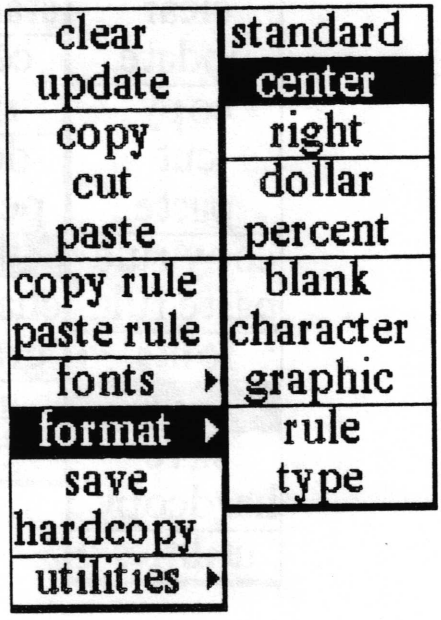
Concept Allows you to assign some contents to a cell but not to display it or hardcopy it.

Procedure Select the cell or cells whose contents you do not want to display or hardcopy and select **format> blank**.

Effect The cell will be white on the Spreadsheet display, indicating a "hidden" contents.

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center



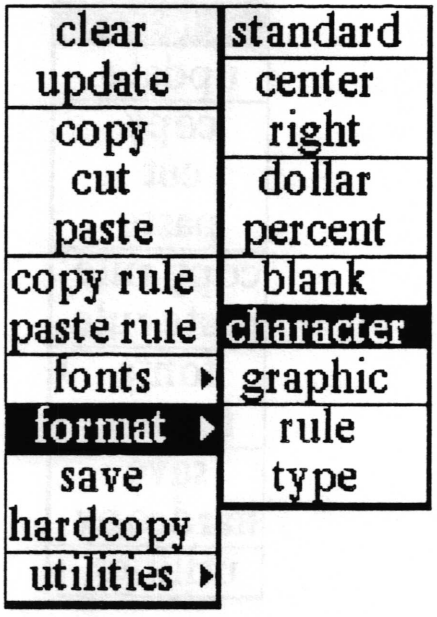
Concept Allows you to center textual contents of a cell within the boundary lines.

Procedure Select the cell or cells and select **format> center**.

Effect Moves the character string so that it is centered within the cell boundaries. The cell must have a value; empty cells do not remember any formatting.

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character



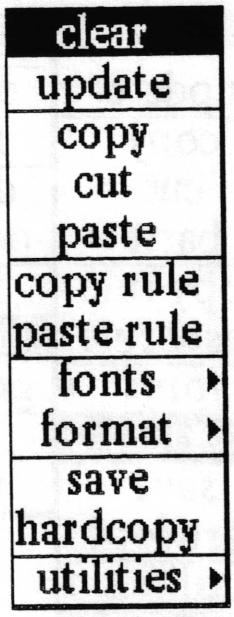
Concept Attempts to display the contents of a cell as alphanumeric characters.

Procedure Select the cell or cells whose contents you want displayed alphanumerically and select **format> character**.

Effect If possible, alphanumeric characters will be displayed in the cell. If the value of the cell is a graphic, "a Form" will be printed in the cell. If the value of the cell is a database, the filename of the database will be displayed as the character string.

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clear



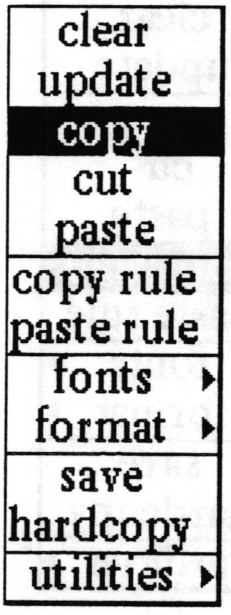
Concept Sets the value of the cell to empty and eliminates the rule.

Procedure Select the cell or group of cells whose contents you want to eliminate and select the **clear**.

Effect The selected cell or cells will have their contents and rules erased and they will be redisplayed in the light gray color indicating that these cells are now empty. The contents is *not* placed in the clipboard, as is the case with **cut**. A possible side effect of clearing a cell may be that some other cell in the sheet that is using the value of the cleared cell in a rule may now be in an error condition.

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copy



Concept Duplicates the selected cell or cells contents and places it into the clipboard.

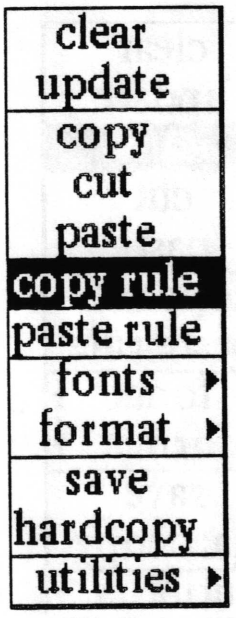
Procedure Select the cell or cells and select **copy**.

Effect The selected cells will be placed in clipboard.

If you **copy** a single cell and **paste** to a selected group of cells, the cell will be duplicated in each. If you **copy** a group of cells and **paste** them into a smaller group, then the selected first group will be "clipped." If the second group is larger than the selected group, no cells will be clipped, and the cells left over will be unaffected. If you **copy** a group and **paste** it into a single cell, the single cell will be set to the cell at the top left corner of the copied group. (Please refer to the documentation on **paste** for a complete explanation.)

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copy rule



Concept Allows you to place a duplicate of a rule in the clipboard.

Procedure Select the cell that you want to copy the rule from by pointing to it with the cursor and clicking the left mouse button. Select **copy rule** from the middle mouse button menu.

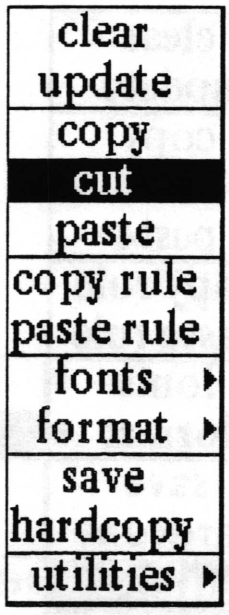
Effect The rule from the selected cell will be placed in the clipboard.

Copying and pasting rules works somewhat like the **copy**, **cut**, and **paste** for cells in general, except that only one cell and one rule may be copied at a time. If a group of cells are selected, the rule from the top left selected cell (the lowest row and column indice) will be copied into the clipboard. You may use **paste rule** to insert the rule into one cell or a group of cells, and all the cells selected will get the rule. Once the rule has been pasted, all the cells that just received it will evaluate the rule and update themselves.

Note: If you accidentally select **paste** instead of **paste rule** following **copy rule**, the cell will receive the value of the previous **copy** or **cut**, not the rule you intended to paste into the cell.

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cut



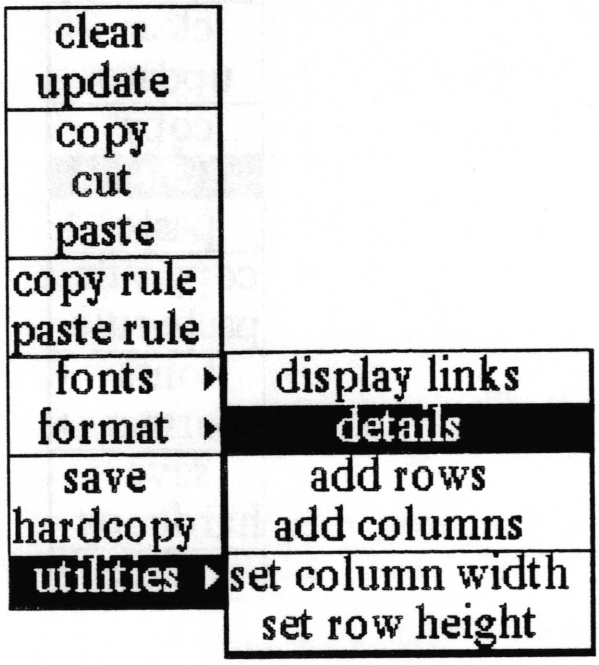
Concept Allows you to delete the contents of a cell or a group of cells.

Procedure Select the cells whose contents you want to cut from the Spreadsheet and select **cut** from the middle mouse button menu.

Effect The selected cells will be cleared of their contents and redisplayed in the gray color of an empty cell. The contents of the selected cells will be placed in the clipboard in case you want to **paste** them into another location of the spreadsheet. If the selected contents are textual, they can also be pasted into another text item in the Analyst.

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details



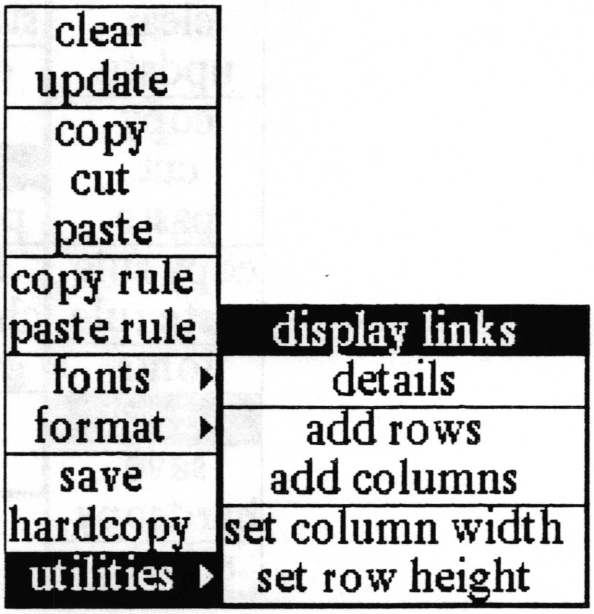
Concept Opens the Spreadsheet upon which the selected cell's value is dependent.

Procedure Select a cell and select **utilities > details**.

Effect The Spreadsheet connected to the selected cell will be opened on the display screen for the user. If there is no Spreadsheet connected to the selected cell the cell will flash in reverse video once.

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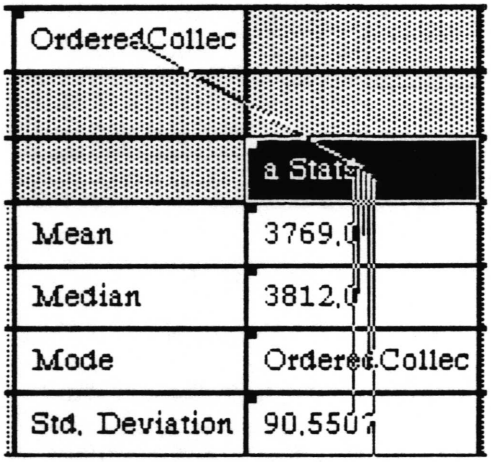
display links



Concept Draws lines to all cells that either depend on the selected cell or supply data to it. This is how to find all of the cells associated with a given cell if you want to move it or change it.

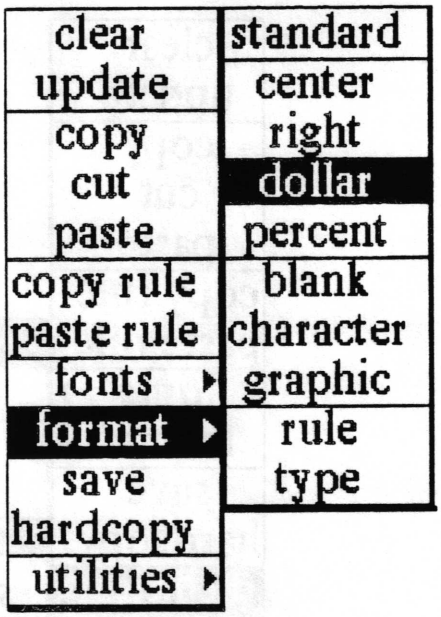
Procedure Select the cell or cells for which you want to display the associated cells. Select **utilities> display links**. The links will be displayed until the user clicks any mouse button in the Spreadsheet window.

Effect Lines will be drawn between the selected cells and the other cells on the sheet that depend on the selected cells. If no cell has first been selected when this option is used, the sheet will display the links among all the cells.



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dollar



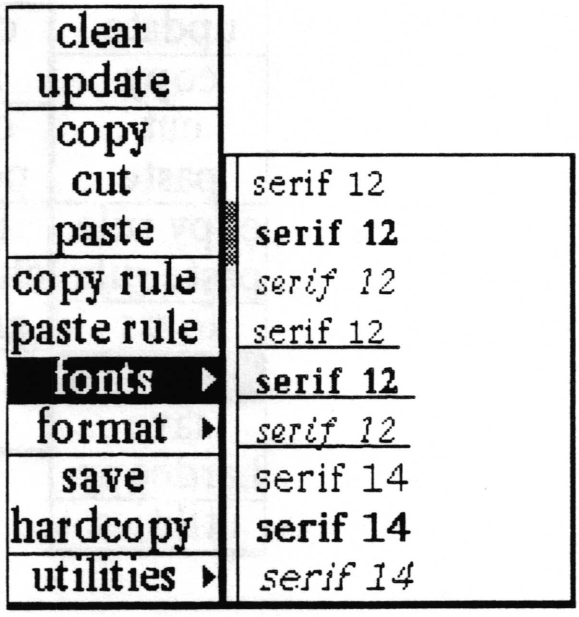
Concept Displays the values of a cell as dollars and cents.

Procedure Select the cell or cells and select **format> dollar**.

Effect The numeric values of the cells will be converted to dollars and cents, preceded by a dollar sign ($) and right justified in the cell boundaries. Whole numbers will be converted to whole dollars. Decimal numbers will be converted to dollars and cents. Negative numbers will display as negative dollar values. If a textual or graphic selection was made, they will simply reprint as they were with no error message.

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fonts>



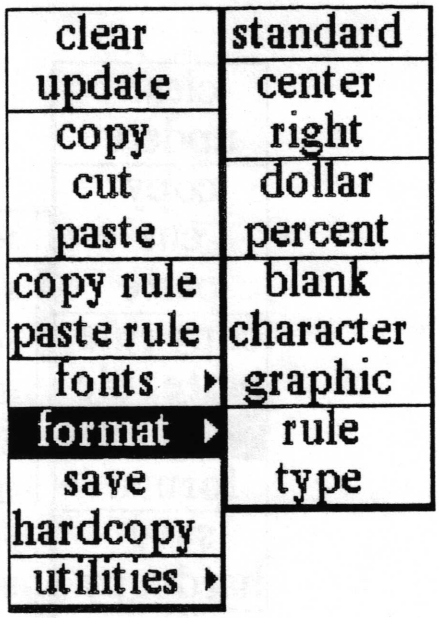
Concept Enables you to change the character looks of selected text.

Procedure Select text to be changed and use the **fonts>** tree to have a new font looks applied to your selected text. Please refer to the *Simple Text* section of this manual for a complete explanation of this menu.

Effect The selected text's font looks are changed.

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format>



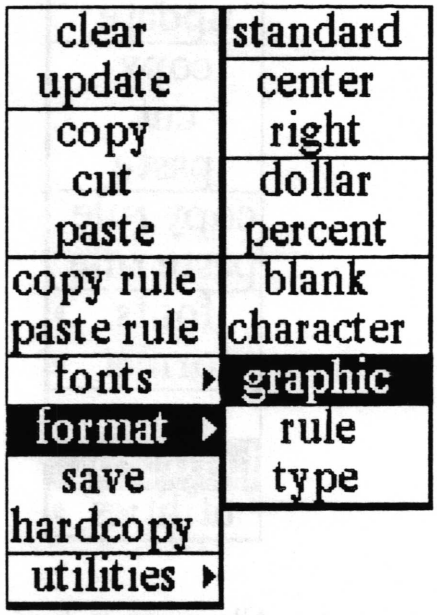
Concept Ten different ways of displaying the contents of the cells are provided.

Procedure Select the cell or cells and use the middle mouse button to bring up the **format>** menu tree. Slide off to the right to choose among: **standard**, **center**, **right**, **dollar**, **percent**, **blank**, **character**, **graphic**, **rule** and **type**. Each of these selections is documented in alphabetical order in this section of the manual.

Effect **Standard** format is the logical format for the value of the cell; graphics are displayed as graphics and strings are displayed as alphanumeric characters, left justified. **Center** and **right** refer to the justification of textual material in the box which deliniates a cell. **Dollar** and **percent** attempt to display numeric values as dollars and cents or as percentages. **Blank**, **character** and **graphic** hide the value, display the value as a character string, or display it graphically, if possible. **Rule** and **type** print the user–defined rule, or tell which of the three parts of the cell (value, rule, or label) the Spreadsheet has been told to display.

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graphic



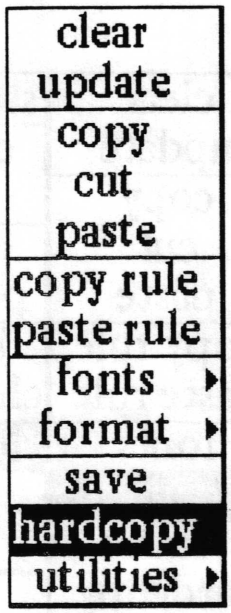
Concept Attempts to display the contents of the cell graphically.

Procedure Select the cell or cells and select **format> graphic**.

Effect If possible (that is, if the value is a Form, BarChart or other Image), the value will be displayed graphically in the cell. If this is not possible, the message **#Undisplayable#** will appear in the cell.

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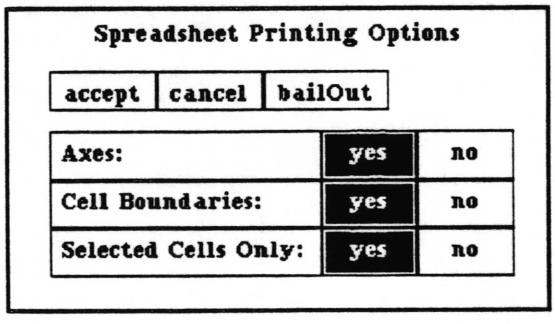
hardcopy



Concept Allows you to hardcopy the Spreadsheet, or make a printer format file ready for printing later by saving it in an Information Center.

Procedure Select the area of the spreadsheet you wish to hardcopy by highlighting those cells. If no cells are selected the whole sheet will be hardcopied. Select **hardcopy** and select the options you want in the **Hardcopy** QBox. The standard hardcopy QBox items are documented in the *System Interface* chapter of this manual.

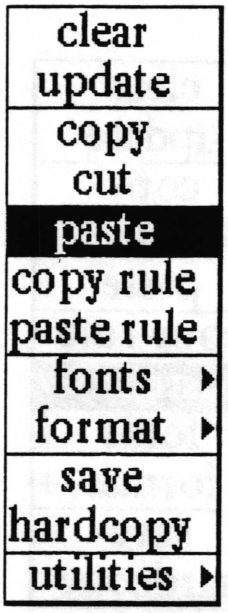
After accepting the Hardcopy QBox, the **Spreadsheet Printing Options** QBox will ask you whether or not to print the **Axes** (the horizontal and vertical cells which indicates the index location), the **Cell Boundaries** (the lines which separate the cells from one another, and **Selected Cells Only**, or the entire sheet.



Effect Your Spreadsheet will be sent to the printer. If the Spreadsheet is too big to fit on one page the system will make as many pages as are required to print all of the indicated cells.

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paste



Concept Allows you to insert the contents of the clipboard into the selected cells of your Spreadsheet. The textual contents of Spreadsheet cells can also be inserted into other Analyst text windows.

Procedure After moving a selection to clipboard with **copy** or **cut**, select the destination cells in the Spreadsheet and use the **paste** choice from the cell middle mouse button menu.

Effect Copying a single cell's contents and inserting it into a selected group of cells will duplicate the cell in each destination cell.

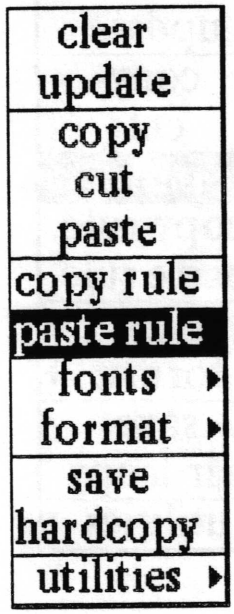
Copying a group of cells and pasting them into a smaller group, will cause the selected first group to be "clipped" when pasting. For example, if 6 cells have been selected for **copy** and only 2 cells have been selected for **paste**, only the contents of the first 2 cells will be inserted into the destination cells. Further, if the cells selected for **copy** are in the same Row but different Columns, and the cells selected for **paste** are in different Rows but the same Column, only the contents of the first cell will be inserted into the first destination cell.

When the second group is larger than the selected group, no cells will be duplicated or clipped; the cells left over will be unaffected.

If you copy a group of cells and **paste** it into a single cell, the entire group will be inserted into cells beginning with the single selected cell, and *overwriting* the values of cells in the Row or Column (depending on what was selected with **copy**) adjacent to the selected cell, moving from smaller to larger Row or Column number.

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paste rule



Concept This will allow you to insert the contents of the clipboard into the selected cells of your Spreadsheet as a rule.

Procedure After copying a rule from another cell, or some text which you want to become a rule into the clipboard, select the destination cell or cells in the Spreadsheet and select **paste rule**. You may **paste rule** a rule into one cell or a group of cells, and all the cells selected will get the rule.

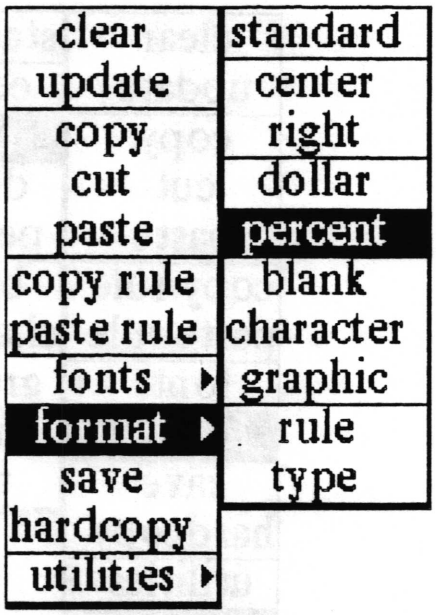
Effect The selected cell or cells will have the rule as their contents. Once the rule has been pasted, all of the cells that just received it will evaluate the rule and update themselves.

Copying and pasting rules from one cell to another works somewhat like the **copy**, **cut**, and **paste** for cells in general, except that you may copy the rule of only one cell at a time (see **copy rule** documentation in this section). If a group of cells are selected for **copy rule** only the rule of the top left selected cell (lowest Row and Column number) will be available to **paste rule.**

Note: If you accidentally select **paste** instead of **paste rule** following **copy rule**, the cell will receive the clipboard contents of the previous **copy** or **cut**, not the rule you intended to paste into the cell.

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percent



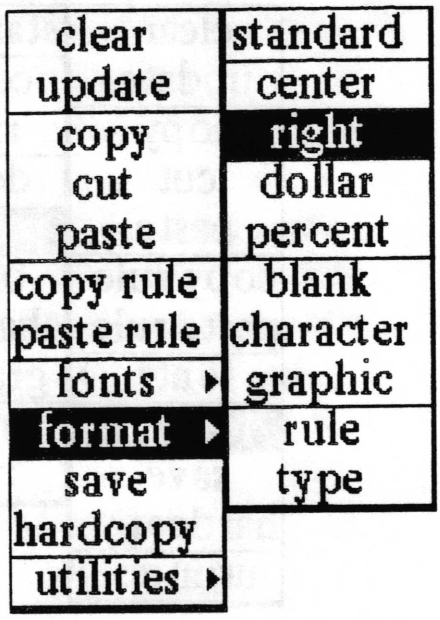
Concept Displays the contents of the selected cell as a percentage.

Procedure Select the cell or cells to be formatted and select **format> percent.**

Effect For numeric values, right justifies the contents of the cell and prints is as a percentage, followed by the percent sign (%). Whole numbers are treated as multiples of 1 or 100%. For example, 4 is formatted to 400.0% Negative selections are printed as negative percentages. Fractions are computed to 2 decimal places; for example 1/3 is formatted to 33.33%. If textual or graphic contents are selected the values are simply reprinted in the cells.

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right



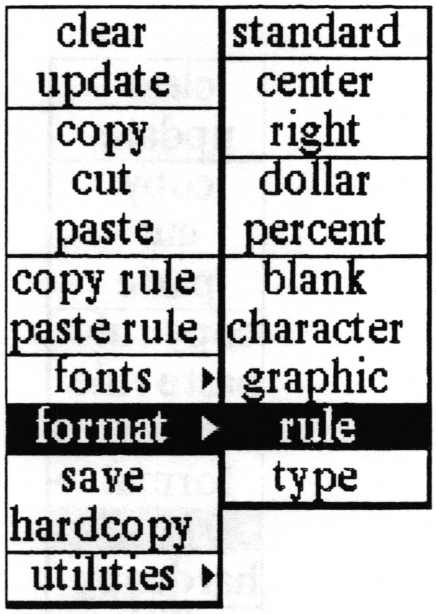
Concept Allows you to right justify the textual contents of the cell within the cell boundaries.

Procedure Select the cell or cells and select **format> right**.

Effect Moves the characters to the right of the cell. The selected cell must have a value; empty cells do not remember their formatting.

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rule



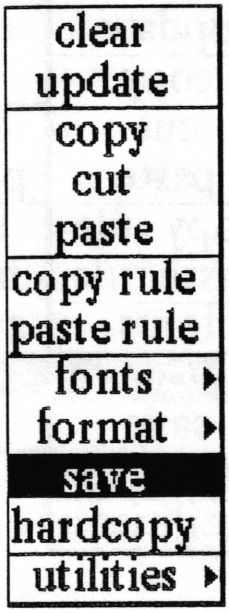
Concept Displays the rule, rather than the result of its evaluation, in the cell.

Procedure Select the cell or cells and select **format> rule**.

Effect The rule used to produce the value will be printed in the cell.

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save



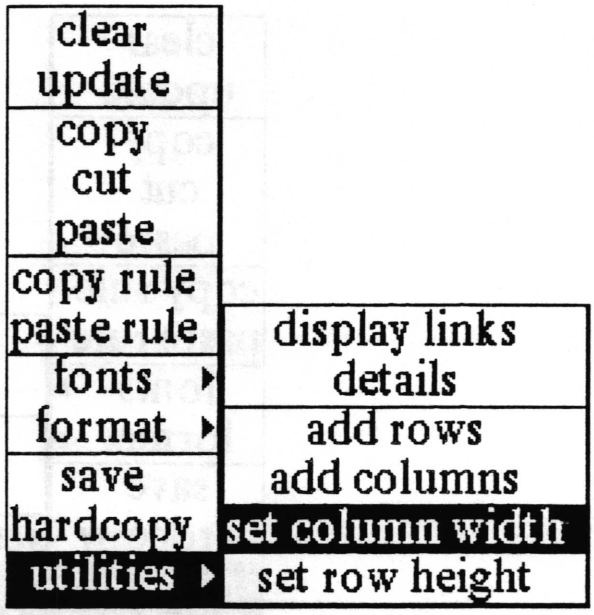
Concept Stores the Spreadsheet, with all present rules and values, onto the disk.

Procedure Choose **save** from the cell middle mouse button menu.

Effect The Spreadsheet, with all its present rules and values will be written onto the disk.

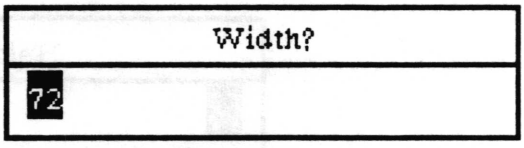
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set column width



Concept Allows you to set the width of the cells in a column in pixels.

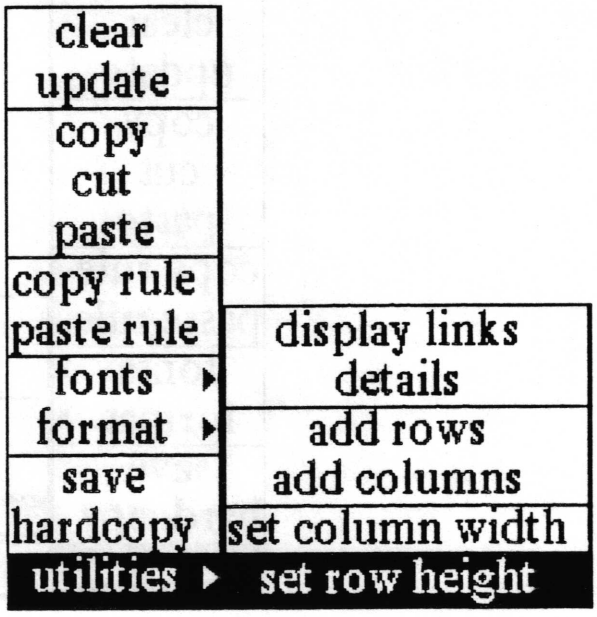
Procedure Select any cell in the column and select **utilities> set column width**. A Prompter will open with the current width in pixels highlighted. Enter the new width and press <return> to enter the new value.



Effect The boundaries of the cells will be changed to make each cell in that column the new width. The columns to the right of the selected column will also be redisplayed correctly.

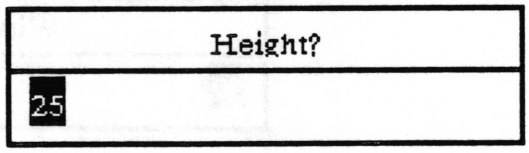
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set row height



Concept Allows you to set the height of the cells in a row in pixels.

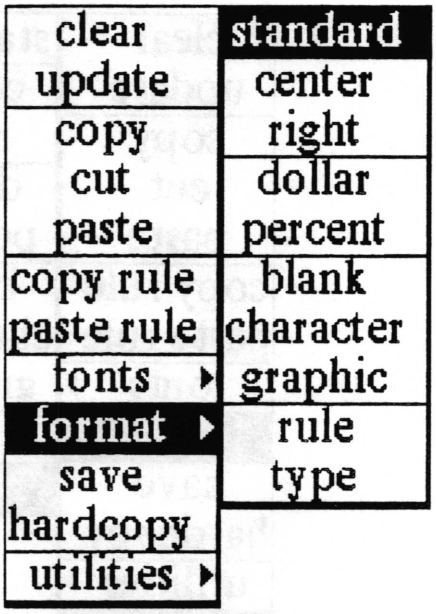
Procedure Select any cell in the row and select **utilities> set row height.** A Prompter will open with the current height in pixels selected. Enter the new height and press <return> to enter the new value.



Effect The boundaries of the cells will be changed to make each cell in that row the new height. The rows below the selected column will also be redisplayed correctly.

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standard



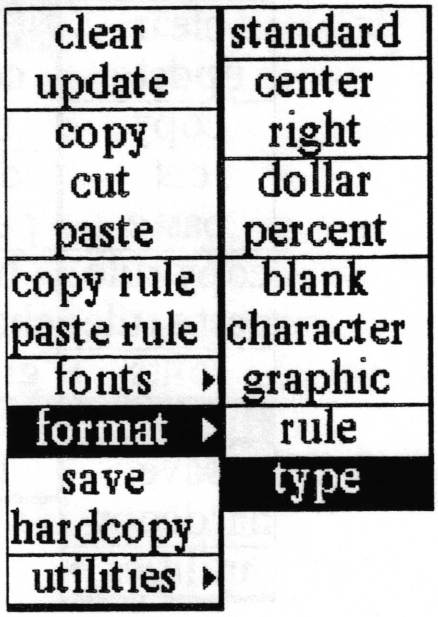
Concept Displays the contents of the cell as either a graphic or a string (alphanumeric characters), depending on what was put into the cell. Useful if you have been experimenting with different formats and want to return to the original format but do not know what it was.

Procedure Select the cell or cells and select **format> standard**.

Effect Returns the contents of the cell to the character string or graphic image, according to the value of the cell. The standard format is left justified.

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type



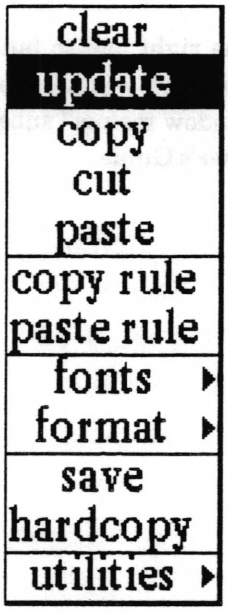
Concept Tells the user which of the three parts of the cell (value, rule or label) the Spreadsheet has been told to display.

Procedure Select the cell or cells and select **format> type**.

Effect The contents of the cell will be replaced with either "value," "rule" or "label."

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update



Concept Tells a selected cell to evaluate its rule and display the result.

Procedure Select the cell that you want to recompute and then select **update** from the cell mouse middle button menu.

Effect The rule for that cell will be evaluated and the cell will redisplay itself with the new value, as long as the **auto update** control button has been selected. If the **no updates** control button was selected, the cell will flash and will not update its contents. When the **auto update** is selected, all of the cells whose contents were changed will be updated, as well as all of the cells that depend on the changed cells.

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Right mouse button menu

The right mouse button in the Spreadsheet panes brings up the standard window popup menu fully described in the "Analyst window menus" subsection of the *System Interface* section of this User's Guide.

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Glossary

absolute — See cell reference

address mode — One of three buttons under the cell area on the Spreadsheet. The default mode is an absolute reference between cells. Relative reference can also be selected.

axes — The numbered boxes displayed horizontally and vertically along the top and left edges of a Spreadsheet. Used to display column and row indices, one per box.

binary operation — A mathematical function operating on two numbers. Addition, subtraction, multiplication, and division are binary operations.

boolean — A type of object whose values are either **true** or **false**.

cell — The basic element of a Spreadsheet arranged into a two dimensional array indexed by row and column. Cells contain values that can be computed dynamically from user – specified rules that may reference values from other cells.

Each cell of a Spreadsheet can hold any Smalltalk – 80 object, including images, databases, popup menus, and files. New functionality added to the software system is automatically accessible by Spreadsheets without modification to the Spreadsheet application software.

cell boundary — A horizontal or vertical line in the Spreadsheet which separates one cell from another.

cell reference — Address mode of the cells to which rules are referred. There are three modes: *absolute*, where both the row and column value of the cell are given as a absolute number; *relative* where both the row and column values relate to the value of another cell indexed from the cell in question; and *mixed* where the row [or column] has an absolute address and the column [or row] has a relative address

classification bars — Bands displayed horizontally across the top and bottom of a Spreadsheet, displaying the required degree of protection assigned to the item in white lettering on a black background when the window is active.

column — Vertical array of cells in a Spreadsheet.

column indices — Sequence of numbers which are in the first unnumbered row beneath the heavy border on the top of the Spreadsheet; designates the column reference number.

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columnNumber A function used in writing Spreadsheet rules to return the column number of the cell the rule is in.

command bar The pane at the very bottom of the Spreadsheet window, used for displaying, specifying, and editing the value, label and rule of the selected cell. It is very much like a typical text window in that you can do some of the usual text editing things with the middle mouse button popup menu.

control buttons Under the Spreadsheet cells are three rectangular control buttons that are set to the default words "value," "absolute," and "auto update." **"value"** refers to the *value/rule/label button.* **"absolute"** refers to the *address mode button.* **"auto update"** refers to the *update mode button.*

float The designation for the value a real number.

if - then A decision making procedure based on boolean, true or false test(s) of the form equal (=), greater than(>), greater than or equal to (>=), less than (<), less than or equal to (<=)or is not equal to(~=).

label One of the three options for the type of contents of a cell. Description of the cell or Spreadsheet.

matrix A group of cells into a two dimensional aray upon which matrix mathematics such as invert, determinant, multiply can be performed.

OrderedCollection An array of items returned to a Spreadsheet from a query of an Analyst Database. The term displayed in the cell which indicates that the contents has come from a Database query.

relative See cell reference

row Horizontal array of cells in a Spreadsheet.

row indices Sequence of numbers which are in the first unnumbered column to the right of the heavy border on the left side of the Spreadsheet; designates the row reference number.

rowNumber A term used in writing Spreadsheet rules to return the row number of the cell the rule is in.

rule One of the three options for the type of contents of a cell. One or more Analyst functions entered by the user into the comand bar. Upon acceptance, the function is evaluated and returns a value to the cell to display as its contents. Especially useful to make the contents of one cell depend upon the contents of another.

scroll button The set of four crossed arrows in the upper left corner of the Spreadsheet.

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scroll map A small window displayed outside the Spreadsheet's heavy lines and to the upper left, after the scroll button is clicked. The representation is 1/15 scale of the entire Spreadsheet. Gray areas indicate data on the sheet. Used to scroll from one section of the sheet to another.

Stats The object returned to a cell by a rule using the function **Stats on: {cell}**, where {cell} contains an OrderedCollection of numbers. The object is in turn accessible by statistical functions.

string Strings are collections of characters in sequence. They are useful for labelling areas of a sheet, giving additional information such as units of measurement, and many other similar tasks.

title tab Attached to the top left corner of a window, it displays a name identifying the information displayed in the window.

unary operation A mathematical function operating on a single number.

update The process of revising the cell values based on all of the inputs to the Spreadsheet since the last revision.

update mode User selectable toggle button which tells the system when you want everything to update. If the system is currently on **no updates**, it will not cause any update to occur until the system is set back to **auto update**, then it will update everything at that point.

value One of the three options for the type of contents of a cell. The information that a cell holds: numbers, strings, points, charts, databases.

xcell **See columnNumber**

ycell **See rowNumber**

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System Administration

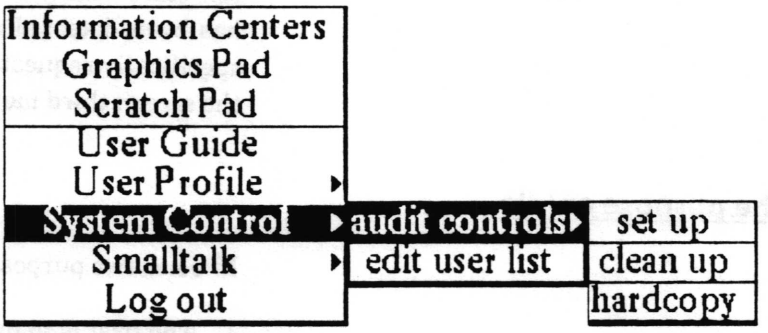
This chapter is meant to provide the information that might be needed by someone serving as a System Administrator to one or more users using Analyst.

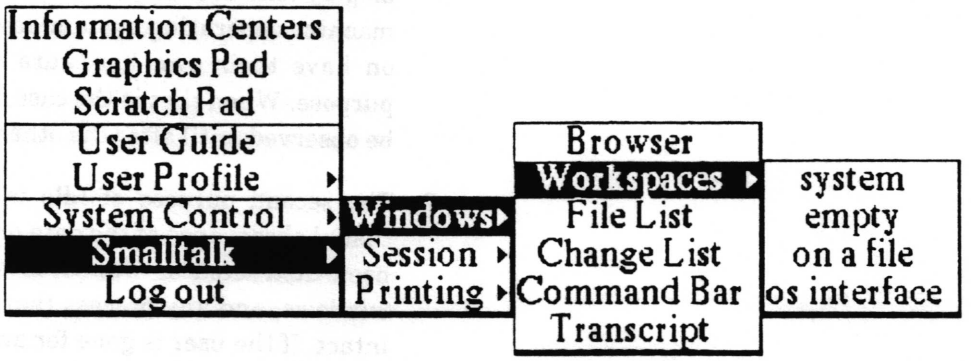
It is not at all necessary to be a programmer to be a System Administrator, but it is necessary to have some knowledge of the operating system environment (Unix, Finder, Tajo) Analyst runs in and to be somewhat familiar with the Smalltalk environment (File List, workspaces, text editing).

Which users have System Administrator privileges within Analyst is defined in the Analyst users file. The person who initially installs Analyst on a workstation will provide or modify this file.

Privileges of an Analyst System Administrator

An Analyst System Administrator has access to two additional sub–menus on the screen middle mouse button menu, **System Controls>** and **Smalltalk>**. Together these menus provide access to the list of Analyst users (including who has System Administrator access), auditing features, and the complete Smalltalk/Analyst programming environment.





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Version Information

A window containing information about which version of Analyst you have can be found by selecting **version info** on the screen third mouse button menu. In the text of the window are the details of what Smalltalk platform it was created on top of, who did it, any major options that were included, and the date and time of every logged out save.

The contents of this window can be edited or added to. It is recommended that anytime you make a change in Analyst that will require you to save the Analyst image, you make a notation at the bottom of the contents of this window and select **accept** in the middle mouse button menu. Then when you save the image, your name and the date and time will be appended on the end, providing a log of what has been done.

Of course anyone who saves the image afterwards can purposely mess up the information in this log, but the fact that that has been done is also informative.

Idle

Idle is the Analyst state where the screen is blackened and an image (bitmap) floats around on it. Whenever a properly logged out and saved Analyst is started up, it will immediately enter the idle state. Analyst will also enter the Idle state if no user activity has been detected after a certain period of time, or if the user specifically requests that idle start by selecting **idle start>** from the screen third mouse button menu.

The purpose of Idle

Idle has two purposes.

1. The first is to protect the screen from being burned by a static display (one that stays the same for a long time). Some of the machines/operating system environments that Analyst runs on have their own hardware or software features for this purpose. When that is the case, the Analyst idle state will not be observed until after the other has been terminated.

2. The second purpose of Idle is security related. It prevents casual observance of the data on the screen when the user has been distracted or wandered off for awhile, but leaves the windows, and any process that take a long time to complete, intact. If the user is gone for an even greater amount of time,

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or specifically requested that idle start with forced login, the user will be required to log in again upon trying to stop idle.

How Idle works

Saving the screen

When Analyst enters the Idle state, it makes and installs a new screen bitmap to display the idle image floating around on. It keeps the entire current screen around for continued use by any active processes that might be writing to it (for instance, map drawing) and to restore the screen when idle is stopped. However, if calculations indicate there is insufficient memory to safely make a whole new screen bitmap, Analyst will instead enter a *low space idle*. A low space idle will suspend all the active processes and not leave the existing screen bitmap intact. When a low space idle is stopped, everything on the screen has to be redisplayed, which may be a problem if it was left with a QBox or other non – window prompter active.

Idle image

The idle image is whatever happens to be the last idle image that was set. This means that the initial idle image seen when Analyst is started up is whatever the idle image was when the image was saved. When a user logs in, Analyst checks for an idle image file corresponding to the user's name. If one exists, its contents become the new idle image.

Behavior parameters

Idle behavior varies depending on how it was started, and/or the amount of time that has passed since it was started. There are three time parameters involved.

Drift delay time When no one is logged in, the idle image will float continuously. When someone is logged in, it will move more haltingly. This *drift delay time* is necessary to allow user processes (such as map drawing) to have time to do anything when idle is active, because idle is a higher priority process. By definition, when no one is logged in, no such process may be active.

Watch time The second time parameter is the approximate number of minutes after the last user activity has been detected before idle will start automatically. This is called the *watch time*. Any cursor movement, mouse click, or key pressed is counted as user activity.

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Second timeout The third time parameter is called *second timeout*. This is the approximate length of time from the start of idling activity before the user will be required to log in again. Prior to the second timeout, simply moving the mouse will wake Analyst up directly the former screen display. After second timeout, only mouse clicks or key strokes will stop idle, and then the logged in user must log in again – a feature known as the *away too long login*. Other users are not allowed to log in and mess with the original users data – only a System Administrator and the original user may log in.

How to modify Idle

User's idle image

The standard way to change a user's idle image is to use **User Profile > idle image** on the screen middle mouse button menu to change the logged in user's idle image. Whatever is in the clipboard when that menu option is selected will become the user's idle image.

The System Administrator's cheating way to change a user's idle image is to delete or replace the user's idle image file with a different file (any image, chart, map, or other user's idle image file will work). This can be done in the operating system environment or from the File List.

Initial Idle image

To change the idle image which is displayed when Analyst is first started up (before anyone logs in), you must change the idle image and then do a log out save. To change the idle image, either change your user idle image, or replace the filename in the following expression and then evaluate it.

"Idle idleForm: (Form readFrom: 'filename')"

See the sections "Recommended procedures for changing and saving" and "Saving image in logged out state".

Behavior parameters

Drift delay time is hardcoded to 2 seconds when a user is logged in, 0 seconds when no one is logged in. You can change it temporarily until you log out by replacing numberOfMilliseconds in the following expression and evaluating it.

"Idle driftDelayTime: numberOfMilliseconds"

To change it permanently, you will need to change the code in LogInOut class > > startUp, and of course save Analyst.

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Watch time has been initialized by the creator of Analyst to 5 minutes. You can change it by replacing numberOfMinutes in the following expression and evaluating it.

"Idle watchTime: numberOfMinutes"

This will remain in effect until Analyst is quit – unless you save Analyst before then.

Second timeout is set to 30 minutes every time someone relogs in. The menu option **idle start> forced login** is implemented by setting the second timeout down to 0. To change the 30 minute time, you would need to change the code in LogInOut class> >reLogIn, and also replace numberOfMinutes in the following expression and evaluate it.

"Idle secondTimeout: numberOfMinutes"

This will remain in effect until Analyst is quit – unless you save Analyst before then.

Preventing Idle start temporarily

Evaluating the expression

"Idle noIdleDuring: aBlock"

with a proper substitution for aBlock, prevents from starting until the evaluation of aBlock is finished. (Unless aBlock is provided to you, you will need to know some Smalltalk programming to use this).

Killing off Idle

Idle can be killed off entirely by evaluating the expression: "Idle killWatcher".
This will last until Analyst is quit.

Idle is restarted by evaluating: "Idle installWatcher".

Idle is automatically killed just before Analyst is saved via a logged out save and reinstalled when Analyst is started up again. This means that even if you kill it and save Analyst correctly, unless you change the code in LogInOut class> >quit, it will be reinstalled the next time you start Analyst up.

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Logging in/out

The Analyst feature that requires a user to login serves three purposes. One purpose is to provide some degree of security. The second purpose is to identify separate users so that the system can be somewhat customized via a user profile and for users to be able to send data to one another. The third purpose is that logging out provides the opportunity for the system to check that all the user's files have been properly saved (or consciously closed without saving) and the Information Center structures saved.

Analyst user names and passwords

Analyst requires the user to login by specifying a user name and password. All the names and passwords of users who may log in are kept in the Analyst users list file located in the current working directory when Analyst is started from the operating system. The user list file may be named either *AnalystUsers* or *ANALYST.USR*, depending on the file naming scheme in use.

When Analyst is delivered, a default user list is provided. The default user list contains two default names: user *system* with password *system* and user *demo* with password *demo*. Logging in as user *system* provides access to the Smalltalk – 80 programming environment and to System Administrator functions. Logging in as user *demo* allows you to interact with Analyst only.

See the "Adding/changing user names and passwords" section for details on modifying the user list.

Logging in sequence details

When Analyst is first loaded from the operating system, its first actions are:

a. Restart the Idle process.

b. Read the network information file (or write a default file if none exists). (See the section "Network information")

c. Check for the existance of the expected source code changes file (SourceFiles at: 2) and if it is not found, set SourceFiles to nil so that **compute it** will not blow up and programmers can see automatically decompiled code. (See the section "Source code files")

d. Sets the Idle drift delay time to 0 and starts Idle.

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When the user hits a key or mouse button, the **Analyst Log In** QBox is displayed. After the user fills it in and accepts, the system:

a. Checks for the presence of the user list file. If it is not found, a notifier appears and the log in attempt is terminated.

b. Looks for the user name in the user list. If is not found, a notifier appears and the log in attempt is terminated.

c. Checks the password provided against the password in the file for that user. If is not found, a notifier appears and the log in attempt is terminated.

d. Determines whether the user has System Administrator status.

e. Checks whether the user is to be audited, and if so, notifies the Auditor to begin auditing.

f. Sends the user name and password to the network login handler.

   f1. If this is not on a Xerox machine and the net login type is not NoNetPassword, then set it to NoNetPassword and write out the default file.

   f2. If the net login type is NoNetPassword, do nothing more here.

   f3. (At this point, it must be a Xerox machine). If the net login type is AutoSetNetPassword, then try to log in to an XNS clearinghouse using the same user name and password the user just used for logging into Analyst. If the net login type is AskNetPassword, then display the **Log in to remote host** QBox. If the user accepts this QBox, try to use the name and password provided to log in with an XNS clearinghouse. If the user bails out of this QBox, just ignore logging into the net and continue the log in sequence.

g. Search the *<AnalystWorkingDirectory>* for Information Center structure files in order to create the list of available Information Centers. This step tends to take the most amount of time, and on Xerox machines particularly, the time taken grows linearly with the number of center files.

h. Check the Classification scheme. If no Classification scheme file can be found, one will be written from the scheme currently in memory. If the Classification scheme file contains a different scheme then whatever is currently in Analyst memory (kept in the DCM), it will read and initialize Analyst from the scheme in the file.

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i. Make the Analyst user name and System Administrator status available to the rest of Analyst.

j. Read the user's configuration file and set the user profile parameters accordingly.

j1. oit menu (if you don't know what it is, forget about it)

j2. screen color (default gray or light gray)

j3. idle image (it will read the user's Idle image file if it exists, otherwise it will leave whatever is already in memory alone).

j4. system font (default is serif 10)

j5. printer name (default is first printer on list from the network configuration file, and if there are none in it, it is left as whatever is was)

j6. file server name (default is to leave it unchanged)

j7. clock list (default is to require user to initialize it by editing the default clock list if and when it is needed)

j8. clipboard status in terms of single, LIFO, or FIFO, and hide or show (default is single, hide)

j9. scroll menu scroll speed (default is 80).

j10. tree menu auto sub – menus (default is enabled)

j11. tree menu accelerate cursor (default is enabled)

j12. tree menu startup position (default is cursor inside)

j13. pop up menus default font (default is serif 18)

k. Notes to the Auditor that it is logged in by the user name at the current date and time.

l. If it is on a Xerox workstation, the net login type is not NoNetLogin, and an Analyst error log file exists, it sends the file to the current printer and has the file removed if it is believed the printing was successful.

m. Displays the greeting message at the top middle of the screen.

n. Sets the Idle drift delay time to 2 seconds.

Logging out sequence details

When the user selects **Log out** from the screen middle mouse button menu, the following sequence occurs:

a. Checks for any open serial port (RS232, VM) windows, andif it finds any asks the user to confirm they are logged out. If the answer is no, the log out is aborted.

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b. Requests the user to acknowledge that all windows must be closed and confirm logging out. If the user selects no, the log out sequence is aborted.

c. Requests each window that remains open on the screen to close. Any window may ask the user to confirm closing without saving. If any window can not be closed, the log out sequence will be stopped.

d. If the state of the clipboard is different from what is in the user configuration file, then that is updated.

e. The user configuration file is compressed. This means that if it has changed it is rewritten, removing any superceded portions.

f. Any Information Centers which are still in memory are saved and removed from memory.

g. The user name is cleared out of memory.

h. The clipboard is cleared.

i. Any network passwords are cleared from memory.

j. The user configuration file is closed and the information removed from memory.

k. The user is asks whether to "really quit".

l. The auditor is shutdown, writing out the current date and time if auditing was active for the now previously logged on user.

m. If the left shift key is down, the logged out save sequence is entered. Otherwise, if the user requested quitting, Analyst is quit and control returned to the operating system. If quitting was not requested, Idle drift delay time is set to 0 and Idle is started.

What could be wrong?

Damage or unreadability of any of the files required during startup and log in (network information, Analyst users list, Classification scheme, user configuration file, user idle image file) can cause logging in to either be unsuccessful or blow up. Remember that on Unix based machines, the user logged into Unix must have permission to read the system files and to read and write the Analyst user files. Files may be damaged do to direct editing and/or linefeeds being introduced into the file in place of, or in addition to, carriage returns. (See "Carriage return vs. linefeed" section).

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Adding/changing user names and passwords

Analyst requires the user to login by specifying a user name and password. All the names and passwords of users who may log in are kept in the Analyst users list file located in the *<AnalystWorkingDirectory>*. The user list file may be named either *AnalystUsers* or *ANALYST.USR*, depending on the file naming scheme in use.

When Analyst is delivered, a default user list is provided. The default user list contains two default names: user *system* with password *system* and user *demo* with password *demo*. Logging in as user *system* provides access to the Smalltalk–80 programming environment and to System Administrator functions. Logging in as user *demo* allows you to interact with Analyst only.

The Analyst users list file cannot be edited directly in a File List or other editor because its contents are scrambled. Edit is using the following procedure.

1. Log in as *system* or some other user with System Administrator privileges.

2. Select the **System Control> edit user list** command on the screen middle mouse button menu. Frame the resulting editing window on the list of users.

3. Add or change user specifications as appropriate. To add a user, enter a new line of the form *name\password\t\20* or *name\password\f\20*, where the *t* switch grants the user access to Smalltalk and system administrator functions and the *f* switch denies the user those accesses. Entries should be separated by a carriage return. (Since access to this file is not very secure, the user passwords should probably not be the same as the Unix or other system passwords)

4. When you are finished editing the list, select **accept** from the middle button menu in the window.

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Changing and saving Analyst

It should only be necessary to snapshot the Analyst if you have changed or added Smalltalk code because Information Centers, the data items within them, and user profile choices are all saved in separate files from the virtual image.

If you are going to change and save the Analyst virtual image, you will be much better off in the long run to keep it clean, to keep track of what you change, and to save it logged out.

Every activity in Analyst, but particularly debugging, has the potential for leaving garbage around in memory, some of which may be harmful. If you are planning to use a particular copy of Analyst for a long time, it is best to save your changes in a file, quit, restart, file in the changes and save it with a minimum of testing or debugging in between. It is also a good idea to always garbage collect before saving.

The version info function provides a convenient place in the image for you to make notes about what changes you have made.

All snapshots of the Analyst should be in a logged-out state, so that subsequently starting-up the Analyst image will require an Analyst user name and password before allowing access, and all the Analyst data structures will be kept up to date.

Saving Analyst logged out

To snapshot The Analyst in the logged out state, do the following:

Select the **Log out** command on the system middle mouse button menu.

You will be asked a series of yes/no questions to confirm logging-out. When you get to the question '*Do you really want to quit the Analyst (tm)?*', hold down the Smalltalk left-shift key while answering *no* with the left mouse button. At this point it will bring up the fill-in-the-blank for the image name. Unless you wish to save it under a different name (for which you should be sure you have enough disk space) simply type a carriage return. When it has finished saving, it will go to the idle state. You may then either log-in or select bailout to quit the image.

Note: On the Apollo, the Smalltalk left-shift key is not the standard keyboard's shift key on the left side, but is instead, the key in the very bottom left-hand corner of the keyboard. The ParcPlace Systems' release notes for the Apollo contains a keyboard map.

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Carriage return vs. linefeed

As Smalltalk/Analyst is moved to an increasing variety of machines and operating system environments, the dilemma of what to do about interacting with files used outside of Smalltalk/Analyst by the operating system and/or other programs grows. One particular area of difficulty has been the usage of the carriage return character and/or the line feed character.

Smalltalk/Analyst has traditionally used the carriage return character (ascii value 13) to break lines of text (moving both to the left side of the window and down a line) and as a convenient delimiter character in general. The Unix environment, however, uses the linefeed character (ascii value 10) for these purposes – and will not accept a carriage return in its place.

Out of a desire to be able to usefully create and edit files from and for those environments outside of Smalltalk/Analyst that use linefeeds instead of carriage returns, the two primary Smalltalk vendors have made different changes to the Smalltalk environment. Unfortunately, both approaches cause major headaches to Analyst, and so it has made further changes to permit a coexistence and still keep Analyst as similar as possible on all the platforms on which it is implemented.

Direct editing of files

If you will be editing any file used by Analyst through use of the File List window or any other editor not specifically designed for editing the file, you need to be aware of the potential line ender choice conflict and how to deal with it.

The format of most Analyst files requires that no conversion of carriage returns with line feeds be done, either because the code which parses them is specifically looking for a carriage return or because they are partially binary data. Still, sometimes it is desirable to be able to edit these files, or other data files, directly and without corruption. On the other hand, when editing files that are going to be, or were, used by Unix, UTek, or some other program you may truly wish to allow the conversion.

On the implementations in which this conflict exists, the File List window has been changed in Analyst to require the user to specify whether the data is to be converted on **get** and **put** of file contents. When you select **get contents**, **get**, or **put** in the File List, a confirmer will appear asking you whether to do the conversion. When putting the contents, selecting *yes* is equivalent to requesting that all carriage returns in the text in the window be replaced by linefeeds in the file. When getting

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contents, selecting *yes* is equivalent to requesting that all linefeeds in the file be replaced by carriage returns in the text in the window. Selecting *no* in either case will cause transfer of data from or to the file to occur in binary mode so that nothing will be changed.

So, when editing Unix, UTek or VI files, selecting *yes* will allow you to not worry about whether you typed line ends using the return or linefeed keys, but when editing an Analyst data or control file, always be sure to use the *return* key and select *no* on *put* in a File List.

File transfers via ftp

You will need to be careful when transferring files via ftp from or to a machine with a Unix based operating system. Many of the ftp implementations try to help you out by changing or adding carriage returns or linefeeds in files being transferred in *ascii* mode. How they are modified differs depending on the direction of transfer and the specific ftp implementation. Analyst data files will not tolerate this messing about, so you should always be careful to transfer Analyst files in *binary* mode.

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OS interface

In most Analyst implementations, the **os interface** option on the **Smalltalk> Windows> Workspaces>** branch of the System Administrator's screen middle mouse button menu provides access to some device for interfacing with the operating system of the machine.

On ParcPlace Systems' Unix based platforms, this will open a window on a Unix C–Shell. On the Macintosh, it will bring up the same menu of desk accessories which is available from the Apple symbol in the top left hand corner of the screen. On Xerox machines, it will open an XDE Interface window. This window allows sending any command to the Tajo executive, and also provides a batch file transfer to and from file servers (via ftp commands it will piece together for you). On the Tektronix 4310, the menu option is not currently linked to anything.

In many Analyst implementations, the **suspend** option on the **Smalltalk>Session>** branch of the System Administrator's screen middle moue button menu provides the ability to suspend execution of the Smalltalk process.

On ParcPlace Systems' Unix based platforms, this will suspend the Smalltalk process and return control to the environment from which Analyst was started. On the Macintosh, multifinder must be in use. On Xerox machines, the user will be returned to Tajo and Smalltalk will be changed into a tiny icon. On the Tektronix, a UTek shell is entered – exit is used to return to Analyst.

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Files used by Analyst

Smalltalk/Analyst platform files

Analyst is built on top of the Smalltalk provided by several vendors. A Smalltalk platform has three basic components – the virtual machine, the virtual image, and the source code.

Analyst is an extension of the virtual image and source code. Simply put, Analyst is built by starting up Smalltalk as provided by the vendor, filing in lots of code, and saving it. Depending on the machine involved, the initial process of filing in the code takes anywhere from a couple to twelve hours. The code filed in is somewhat differently depending on the machine and Smalltalk platform. The intent is to have the end result to basically look and function the same way on each machine, but still take advantage of machine or vendor specific special functionality or facilities.

Virtual machine

The *Smalltalk Virtual Machine* or Smalltalk *interpreter* reads a Smalltalk Virtual Image file and interprets (executes) the code in it. It operates as an application or tool in the operating system environment (Unix, Macintosh, Tajo). It is written in one or more languages other than Smalltalk (assembly, C, microcode, Mesa).

This file is specific to the type of machine. That is, there are different versions for example, for each of the Sun 2, Sun3, Sun 4, Macintosh, Tektronix 4315, Xerox 8010/1108, and Xerox 6085/1186.

Virtual image

This is a file containing Smalltalk objects, including all the Smalltalk compiled code. It is essentially a "snapshot" of the state of the Smalltalk environment in memory at a particular point in time.

When Smalltalk or Analyst is saved, this is the file it is saved to. Traditionally, this file is named with '.im' as a suffix, and most implementations automatically append it on to the name the user provides when saving. There is no requirement that is be named that way, however, and in fact, Tektronix leaves the suffix off.

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Source code files

Smalltalk and Analyst can operate just fine without the source code files unless the user wants to program. The source code files simply contain the ascii format text of every Smalltalk method. Each compiled Smalltalk method in the virtual image keeps track of a file number and a file position which is supposed to correspond to the location of its source code. This means that if the source code files are to be useful, they must go along everywhere a virtual image file goes.

There is a global variable in Smalltalk named SourceFiles which holds onto the source code files. It usually contains an Array of FileStream objects, one for each source file.

There is always one, but there may be more, read only *source* files. (SourceFiles at: 1) refers to the primary source file. Analyst has an additional read only source file located in the third position of the Array. These read only source files are traditionally named with a suffix of '.sources', but they do not have to be, and in fact, Textronix does not.

There is also always a read and write source code file known as the *changes* file. It is always located at (SourceFiles at: 2). Every time code is compiled in the virtual image, it is written out to the changes file. Traditionally this file is named with a suffix of '.changes', but it does not have to be.

If SourceFiles is set to nil, then Smalltalk will not bother with either trying to read source code or write out changes. If the user selects a method in the browser when there are no source files, the compiled method will be decompiled – resulting in all the temporary variables being named t1, t2, ... tn, and no comments.

Analyst file naming schemes

The various machine platforms that Analyst functions on impose a variety of restrictions on allowable file names. In the beginning, Analyst was developed on Xerox workstations whose file systems do not differentiate between upper and lowercase letters and had maximum file name length restrictions varying from 34 to about 100 characters. It was next fully ported to Sun 2/3 workstations, encountering Unix. This required changes for Unix based versions to recognize that upper and lower case characters result in different file names. With the movement to the Macintosh, the maximum file name length had to be reduced to 31 characters. The file names used and created by Analyst on all these machines are now fully compatible with one another – except that two uniquely named files on a Unix workstation may be the same file name on a Xerox workstation. This file naming

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scheme has come to be known as the "regular", traditional, or primary file naming scheme.

With the port to the Apollo workstation and its strange file name restrictions (max 31, upper case counts double – apparently this restriction will be removed with the next system software release), and the expectation of porting to machines using the DOS file system, a second "MSDOS" scheme was developed which limits the file names to eight or fewer characters, followed by a period, and then up to three characters in the suffix.

With Analyst 3.0, all the Analyst system, user, and data file naming basics have been centralized into the class DataControl and its new subclass DataControlMSDOS. The global variable DataMaster is an instance of one or the other of these classes, depending on which file naming scheme is in use. The DataControlMSDOS class contains a set of utility methods for converting files and Information Centers from one scheme to the other.

Changing the file naming scheme

Although Sun 2/3, Macintosh, Tektronix, and Xerox workstation versions of Analyst are delivered using the "regular" scheme, if you are running a mixed network with machines such as the Apollo or Sun 386i which will need to use the more restrictive "MSDOS" scheme, you will probably find it advantageous to have Analyst use that scheme on all machines. (Although, in order to conserve resources, the Xerox version is not delivered containing the DataControlMSDOS class, it can be filed in and will work just fine).

To switch to the "MSDOS" file naming scheme, simply execute "DataControlMSDOS initialize". To change it to the regular scheme, execute "DataControl intialize". Of course, if you want to keep the change, you will need to save the virtual image after doing this.

Converting existing data and Information Center files to a different file naming scheme can be quite painful because several of the files have internal references to other file names. The utility methods in the class side of DataControlMSDOS handle the majority of such cases. There are three primary top level methods there to look at, each of which creates a log file containing one line for each converted file consisting of the old name, followed by a slash, followed by the new name. In the case of data files which refer to other files, it will make a new file with the references changed to the expected new names of those files. The log files can be used to create command files for moving the files.

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convertNamesOfSystemFilesToNaming:
results in a file named 'SCONVERT.LOG' which simply provides the name conversions. No system file currently refers to another file by name.

convertNamesOfFilesForUser:toNaming:
results in a file named 'UCONVERT.LOG' which contains the name conversions for the specified user. References to other files are not currently possible.

convertInfoCentersNamed:toNaming:
results in a file named 'CCONVERT.LOG' which contains the name conversions for the all the files in the specified Information Centers, including the Information Center structure files. Where it had to make a new file, the same name will be listed on both sides of the slash in the entry in the log.

There is still one method used in the creation of new file names which is outside of DataControl. That method is located in FileDirectory and is used by String>>asFileName to insure a valid file name for the type of file system in use. This can result in the file name of the converted center name being too long for a DOS file system. If this happens, simply rename it, preserving the new suffix.

File permissions

Numerous problems arise with file permissions when users with different Unix or UTek userids try to share the same Analyst files. New files are created by Smalltalk to allow writing only by the owner. Unless each Unix/UTek user uses a separate directory (the recommended procedure, shared read only files need only be linked), or all Analyst users log in to Unix as the same user, you will likely find it necessary to use chmod to give all users permission to write to all the files, and to repeat the process when new files have been created.

Analyst system files

There are a number of Analyst system files which are shared by every Analyst user in a particular *<AnalystWorkingDirectory>*. These files are maintained and may require some setup by the System Administrator.

Analyst users list

The names, passwords, access level and auditing control of everyone allowed to log in to Analyst are located in an Analyst users list file located in the *<AnalystWorkingDirectory>*. The

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user list file may be named either *AnalystUsers* or *ANALYST.USR*, depending on the file naming scheme in use. The file is scrambled to prevent it's contents from accidentally being divulged to non–System Administators. It is edited from within Analyst through the options on the **System Control>** branch of the screen middle mouse button menu that users logged on as System Administrators will see.

The non–scrambled file format is a line for each user as follows:
username\userpassword\a\n <cr>
where:

username is the Analyst login name of the user

userpassword is the Analyst login password for the user

a is the character 'f' for regular users, or the character 't' for a system administrator

n is the number '20' for a user not being audited or the number '66' for a user being audited.

<cr> is a carriage return (be sure to put one on the last line of the file too)

\ is the backwards slash character.

Here is an example set of entries:
system\system\t\20
demo\demo\f\20
user\dummy\f\66

Network information

The *network information file* is a file which contains non user specific information about network facilities for the use of Analyst. It must be located on the *<AnalystWorkingDirectory>* at the time the Analyst is started from the operating system environment. If no file is found, a default file will be created.

The exact name of the network information file depends on the file system in use. Currently, on Sun, Macintosh, Tektronix, and Xerox workstations, the file name is *networkinfo*. On Apollo workstations (and any other workstations using a DataControlMSDOS DataMaster) the file is named *NETINFO*.

For more information and details of the format of this file, see the "network information file" section of the "Moving files around – Terminology" section of this chapter.

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Classification scheme

The file named either 'Classifications' or 'CLASSIFS', depending on the file naming scheme in use, defines the classification schema that will appear in Analyst. If it does not already exist on the *<AnalystWorkingDirectory>*, a default version will be created when the first user logs in.

For more details on the Classification scheme, see the "Classification scheme" section of this chapter.

On - line user guide

The on-line User Guide which is accessed in Analyst by selecting **User Guide** on the screen middle mouse button menu is expected to be in two files in the *<AnalystWorkingDirectory>*. These files are named either *ReferenceManual.manual* and *ReferenceManual.manual.txt* or *REFERENC.UG* and *REFERENC.UGT*, depending on the file naming scheme in use.

These files are actually just the two files of an outline data item, renamed to the special file names the User Guide software looks for. This means that if you wish to alter the on-line user guide, all you need to do is copy the two files to the proper names for an outline data item (see the "Analyst data files" section), recover the item in the Scavenge center, and edit it like any other Outline data item. Once it is changed to your satisfaction, simply copy the modified files back over the files used by the User Guide.

Third button menu help

The text that comes up when a user selects **help** in the third button menu of many windows in Analyst comes from two files on the *<AnalystWorkingDirectory>*. One file contains the text and the other is an index into it. The files are named either *help.data* and *help.index* or *HELP.DAT* and *HELP.IND*, depending on the file naming scheme in use.

Error log

When users of Analyst generate error reports (by selecting **no** in response to "Do you want to debug?" and **yes** in response to "Do you want to generate an error report?") the report information is written out to a file on the *<AnalystWorkingDirectory>*. That file is named either *AnalystError.log* or *ANLSTERR.LOG*, depending on the file naming scheme in use.

If users make a habit of generating error reports and they are collected, they can be a valuable aid in finding bugs and determining problem patterns. System Administrators should

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check this file now and then if for no other reason than to save disk space by deleting it if it gets really big. (On Xerox machines on a network, Analyst will try to automatically send this file to a printer each time a user logs in, and then delete it if successful).

For more information on the contents of this file, see the "Error log" section of this chapter.

Audit trail

When a user is being audited, the audit information is written to a file on the *<AnalystWorkingDirectory>*. This file is named either *AuditTails* or *AUDIT.LOG*, depending on the file naming scheme in use.
Because this file will tend to get quite long, when a user is being audited the System Administrator should check and cleanup this file frequently.

For more information about the auditing feature, see the "Auditing user activity" section of this chapter.

Analyst user files

There are several Analyst user files which help to personalize Analyst for a specific user. One or more of these files will exist for each user who has logged into Analyst on a particular *<AnalystWorkingDirectory>*. These files are only created as needed by the actions of the user. They can be backed up and restored by a user from and to any workstation in a network which has been configured by a System Administrator to allow it (see the "Moving files around" section).

User configuration

This file basically contains all the user's choices from the **User Profile>** branch of the screen middle mouse button menu (except usually not the idle image), plus the clock list. It contains a user's choice for background screen color, system font (default text typein font,) clipboard settings, clock time zones, default printer and file service names, menu activity preferences, and in a one variation of Analyst, the labels and auto login sequences for its VM interface. It may also contain the name of an idle image to be used if no idle image file is found in the *<AnalystWorkingDirectory>*.

The name of this file is created from the user's Analyst login name concatenated with the suffix *-configFile* or *.CNF*, depending on the file naming scheme. If the user name is so long that the total file name would be too long, the user's name will be truncated. It is located on the *<AnalystWorkingDirectory>* and

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will be created if it does not already exist. Changes made to it during the course of a user session are generally not written out to the file until the user logs out.

Idle image

If this file exists, it contains the idle image of the user whose name is a part of the file name. The name of this file is created from the user's Analyst login name concatenated with the suffix *.idleImage* or *.IDL*, depending on the file naming scheme. If the user name is so long that the total file name would be too long, the user's name will be truncated. The file is located on the *<AnalystWorkingDirectory>* and, if it does not already exist, will be created the first time the user sets the idle image using the screen middle mouse button menu option **User Profile> idle image**. This file's format is identical to the format of Sketch Editor files.

Scratch pad

If this file exists, it contains the scratch pad of the user whose name is a part of the file name. The scratch pad is accessed by a user from the screen middle mouse button menu option **Scratch Pad**. The name of this file is created from the user's Analyst login name concatenated with the suffix *.notepad* or *.PAD*, depending on the file naming scheme. If the user name is so long that the total file name would be too long, the user's name will be truncated. The file is located on the *<AnalystWorkingDirectory>* and, if it does not already exist, will be created the first time the user saves the Scratch Pad. This file's format is identical to the format of Simple Text files.

Function keys

This file contains the definitions a user has made for his function key lists that are used in the RS232 interface. It is useless without a corresponding user configuration file. The name of this file is created from the user's Analyst login name concatenated with the suffix *–FunctionKeyDefs* or *.FNK*, depending on the file naming scheme. If the user name is so long that the total file name would be too long, the user's name will be truncated. The file is located on the *<AnalystWorkingDirectory>*.

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Analyst data files

All Analyst data item files are named by taking the original label requested by the user (or a hardcoded temporary name), deleting illegal or undesirable characters, truncating it sufficiently to be sure it will fit into length constraints, attaching a suffix determined by the type of data item, and then incrementing an attached index until the name is a file name which is not already in use on the *<AnalystWorkingDirectory>*. For data item types that require more than one file, the other file names are generally created by tacking another suffix on the end of the primary file name.

Generally the user does not see these names, just the data item label which is stored in a header field in the file of most data item types. Looking at the file names can be misleading because when a data item is renamed in an Information Center, only the label is changed, not the file name. To determine the true name of a data item's file(s), select the item in an Information Center folder and then select **maintenance> file name list** from the folder middle mouse button menu. If a folder is selected, this menu option will give the file names of all the items in that folder and any folders within it.

Information center structure files

An Information Center is kept in a file on the *<AnalystWorkingDirectory>* which has a name consisting of the name of the center followed by the suffix *.center* or *.CTR*, depending on the file naming scheme in use. This file does not contain any of the data items, just references to them. It contains the name of the user who created it (the owner), the password (if any), the classification scheme the items in it are classified under, and the entire structure of the center – the link types and how all the items are linked together, the label and file name of each data item.

Regular suffixes

When using the "regular" file naming scheme, Analyst makes sure the files have a unique name on the *<AnalystWorkingDirectory>* on which they are created by appending after the suffix a *–n* where *n* is an integer that will make the file name unique.

Currently existing suffixes are:

.text A Simple Text file.

.docs A Document file. When the Document is open and being edited, it may have a backup file which has the same

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name except for the suffix *.Bdocs*, and/or a changes file which has the suffix *.Cdocs*.

.outline An Outline file containing the outline's structure. The text is contained in a file of the same name with the additonal suffix *.txt*.

.bb A Report file. This is an obsolete data type (you can no longer create new ones). This file contains the text. A file by the same name with the additional suffix *.lis* contains a list of images used by the picture pane.

.eform An Analyst Form file.

.db The primary data file of a Database. A file of the same name with the additional *.queries* suffix contains any saved query or report formats and a record entry form if one has been saved by the user.

.ss A Spreadsheet. Note that Spreadsheets must be uniquely named by the user, Analyst is not allowed to make the label different from the file name.

.image The bitmap of a Sketch (image or picture).

.chart The bitmap of a Chart. The chart data is currently kept in a file by the same name with the additional suffix *.dat*.

.map The bitmap of a Map. There must be a file of the same name with the additonal *.control* suffix which contains the coordinates of the area mapped and the base of the file names containing the vector data. The files containing the vector data have suffixes of *.mapData* and *.mapHints*.

.bimage A Graphic file. Currently this data type is left undocumented because it is not yet generally useful or readily created without Xerox hardware and special software.

.interpress An Interpress printer format file.

.postscript A PostScript printer format file.

.pv A Preview file. This is an obsolete data type. This file contains the structure and list of other (image, map, chart) files used by it. The text is in a file by the same name with the additional suffix *.txt*.

.pvp A portrait Preview file. See "*.pv*".

.pvl A landscape Preview file. See "*.pv*".

.pkg a Package file.

.icon An Icon set. These are not available to customers yet.

.rules An Assistant rule set.

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MSDOS suffixes

When using the "MSDOS" file naming scheme, Analyst makes sure the files have a unique name on the *<AnalystWorkingDirectory>* on which they are created by incrementing an integer just in front of the suffix.

Currently existing suffixes are:

.NT A Simple Text file.

.DC A Document file. When the Document is open and being edited, it may have a backup file which has the same name except for the suffix *.BDC*, and/or a changes file which has the suffix *.CDC*.

.OL An Outline file containing the outline's structure. The text is contained in a file of the same name with the additonal suffix *T*.

.RP A Report file. This is an obsolete data type (you can no longer create new ones). This file contains the text. A file by the same name with the additional suffix *L* contains a list of images used by the picture pane.

.EF An Analyst Form file.

.DB The primary data file of a Database. A file of the same name with the additional *Q* suffix contains any saved query or report formats and a record entry form if one has been saved by the user.

.SS A Spreadsheet. Note that Spreadsheets must be uniquely named by the user, Analyst is not allowed to make the label different from the file name.

.IG The bitmap of a Sketch (image or picture).

.CH The bitmap of a Chart. The chart data is currently kept in a file by the same name with the additional suffix *D*.

.MP The bitmap of a map. There must be a file of the same name with the additonal *C* suffix which contains the coordinates of the area mapped and the base of the file names containing the vector data. The files containing the vector data have suffixes of *.MPH* and *.MPD*.

.BI A Graphic file. Currently this data type is left undocumented because it is not yet generally useful or readily created without Xerox hardware and special software.

.IP An Interpress printer format file.

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.PS A PostScript printer format file.

.P A Preview file. This is an obsolete data type. This file contains the structure and list of other (image, map, chart) files used by it. The text is in a file by the same name with the additional suffix *T*.

.PP A portrait Preview file. See "*.P*".

.PL A landscape Preview file. See "*.P*".

.PK a Package file.

.IC An Icon set. These are not available to customers yet.

.RL An Assistant rule set.

Setting up for printing

Analyst hardcopy creates fully formed PostScript (or Interpress) files ready to be sent to a printer that understands PostScript (or Interpress). Implementations of Analyst on Xerox workstations do not include PostScript printing due to resource limitations – but it can easily be added if requested. All the other implementations of Analyst currently contain capability to create either type file, with a default setting of PostScript. (Interpress is included primarily for Xerox users who are willing to go to the trouble to transfer the file by hand to a device which can send it to an Interpress printer). Which type of file is created can be switched by selecting the type in the QBox obtained by selecting **set hardcopy type** on the **Smalltalk> Printing>** branch of the System Administrator's screen middle mouse button menu. Unless the virtual image is saved, this change will go away when Analyst is quit. It can also be changed automatically each time Analyst is started from a particular *<AnalystWorkingDirectory>* by indicating the printer file type in the network information file (see that section for details).

On Unix platforms, Analyst will attempt to send a PostScript file via the Unix command *lpr*, using the printer name specified in the QBox as the name of the printer (Unix) or mdqs queue (UTek). This means you need to set up the various control files so that lpr will be able to successfully send the file to a PostScript printing device. See the release notes for further details.

On the Macintosh, a PostScript file is sent by the ParcPlace printFile SystemCall, which is implemented in the virtual machine. Because the SystemCall has no support for specification of the number of copies or printer name, those options on Analyst's hardcopy QBox will have no effect– –you will always get one copy and the printer is whatever is specified within the

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standard Macintosh os. During the actual sending of the file to the printer, the primitive takes over and you must wait for it to finish (unless you are using MultiFinder). If you are using Apple's OS 6.0, you may find a blank sheet of paper is printed after each print job. This is a result of the use of the Print Manager to send the file rather than a problem in the file.

On Xerox workstations, the Interpress file is sent via a primitive which uses the Tajo executive. The file will not be sent if you are not properly logged into a clearinghouse on the network.

Classification scheme

The Analyst contains a feature for keeping track of classifications of data. Every type of Analyst data item may be classified. Some of them, such as Documents, Outlines and Databases also keep track of the classification of each sub–part such as paragraphs, sections, and records. An Information Center folder derives its classification from the classification of the folders and items within it.

Users set the classification of something through use of a **Classification** QBox, or a classification section of another QBox.

The *abbreviated* words displayed in the QBox, in the classification bars of item windows, in folders, and on item sub–parts, correspond to unabbreviated words or phrases which are used on hardcopy output. These two sets of words, the order in which they appear, and rules which specify relationships between them are all contained in a Classification Scheme which is set up by a System Administrator.

Only one Classification Scheme may be in use at any one time in Analyst. It is kept in memory in a global variable named 'DCM'. Each time a user logs in, Analyst initializes DCM from a file it expects to find on the *<AnalystWorkingDirectory>* which is named either 'Classifications' or 'CLASSIFS', depending on the file naming scheme in use. If the file is not found, Analyst will create a file containing a simple default scheme. Unless a System Administrator has altered the Classifications schema file, this simple default is what will be used. To assist a System Administrator in creating a more suitable Classification Schema file, Analyst contains a Classification scheme editing window.

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Levels and modifiers (controls)

A scheme for classifying data in the Analyst has three major parts, the *levels*, the *modifiers* (also known as *controls*), and the *rules*. The first two parts, levels and modifiers, specify exactly what terms can be used to specify classifications.

The levels are terms which describe the general level of sensitivity of the data. They are generally mutually exclusive. For instance, Unclassified, Confidential, Secret, and Top Secret are classifications used by the US Government to classify data. They are mutually exclusive, meaning that, for instance, a piece of data cannot be both Confidential and Secret at the same time.

The modifiers are terms used to further define the nature of the data. In general, they are not mutually exclusive (there can be several modifiers simultaneously), nor are they exclusive of levels (they can be activated at any security level). There are exceptions to this, which we will discuss a little later. A good example of a modifier might be 'Draft', a modifier specifying that this data represents uncompleted work. 'Draft' would apply as well to a secret document as it might apply to an unclassified document.

Rules

As mentioned above, there are probably certain cases where modifiers supercede one another or cannot be activated unless a certain level is in effect. You can specify these particular constraints by specifying rules. Rules tell the system when any modifier is disabled. A disabled modifier cannot be turned on unless the conditions which disabled it are removed. This may be hard to understand at first, but it's really pretty simple. Let's look at an example:

> Suppose you have three levels: Unclassified, Personnel, and Private Data.
> Suppose you have four modifiers: Internal Use Only, Draft, Note, and Memo.
>
> You want the 'Internal Use Only' modifier to be available only for unclassified data. Since the rules specify when modifiers are disabled, you have to cast this sort of rule by saying:
>
> 'Internal Use Only' is disabled when 'Unclassified' is not on.

Every one of your rules will specify the case when a particular modifier is disabled. By definition, levels are never disabled, and only one can be in effect at a time. We will discuss the exact

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wording of the rules a little later, but it's important to understand that:

1. There is at most one rule for any modifier.
2. The rule specifies when the modifier is disabled.
3. There are no rules for levels.

Editing the classification scheme

To edit the classification scheme presently in use, execute the following code:

```
ClassificationCompiler openOn: DCM
```

This will open a window with three panes, called the Levels pane, the Modifiers Pane, and the Rules pane. Each of the panes is labeled for your convenience. Each is used to specify one of the components of the classification scheme. We will examine each in detail.

Classification Editor

Levels:	Modifiers:
, Unclassified, Unclass Personal, Pers Private Data, Priv	Internal Use Only,IUO Draft, Draft Note, Note Memo, Memo
Rules:	
IUO ← Unclass not. Draft ← nil. (Note Memo) ← '' & Draft.	

Specifying levels

One pane of the Classification Editor Window is used to specify the levels of classification available. Each line specifies one level. The topmost line must be the least sensitive level, and the bottommost line the most sensitive. The level should be specified as the unabbreviated form~ of the level, followed by a comma,

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followed by an abbreviated form~ of the level, followed by a carriage return. If you want to have a level of classification that appears blank, use a single comma followed by a carriage return. The levels for the system used above might look like:

```
,
Unclassified, Unclass
Personal, Pers
Private Data, Priv
```

Specifying modifiers

A second pane of the editor, labeled Modifiers, is used to specify the number of available modifiers. It works exactly like the Levels pane, i.e. each line specifies one modifier. The modifier should be specified as the unabbreviated form of the modifier, followed by a comma, followed by an abbreviated form of the modifier, followed by a carriage return. Again, taking the example above, we might enter:

```
Internal Use Only,IUO
Draft, Draft
Note, Note
Memo, Memo
```

Specifying rules

The rules about when modifiers are disabled are specified in a compact form based on the abbreviated forms of the levels and rules.

Each rule specifies how one or a group of modifiers can be disabled. The general form of a rule is:

<ModifierOrList> ~ <expression>.

The <ModifierOrList> is either the name of a modifier or a list of modifiers surrounded by parentheses. Notice that a period must follow every rule.

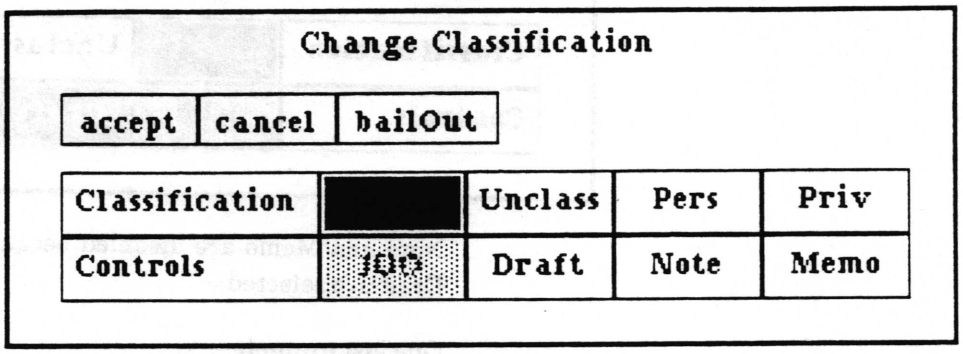
The <expression> is more complex. The expression can contain names of modifiers or levels which can disable the <ModifierOrList>, along with & (and), / (or), and *not*. Parentheses can be added to change the order of evaluation. Here is an example:

We want the 'Internal Use Only' modifier to be disabled unless the 'Unclassified` level is in effect. We could specify this rule as:

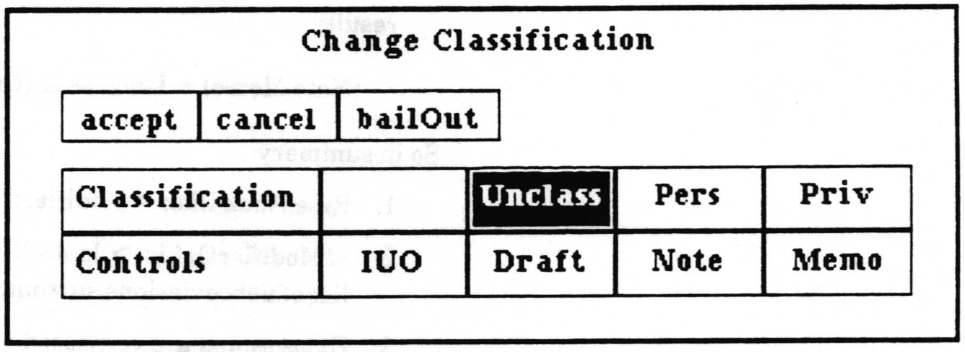
```
IUO ~ Unclass not.
```

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Notice we used the abbreviated form for both the modifier and the level, and that we used *not* to specify that IUO is disabled whenever Unclass is not the level.



IUO is disabled because Unclass is not in effect.



Unclass is selected, so IUO has been enabled for selection.

Now for a more complex example:

We want the Note and Memo modifiers to be disabled only when the empty level is in effect and Draft is turned on. We can specify this as:

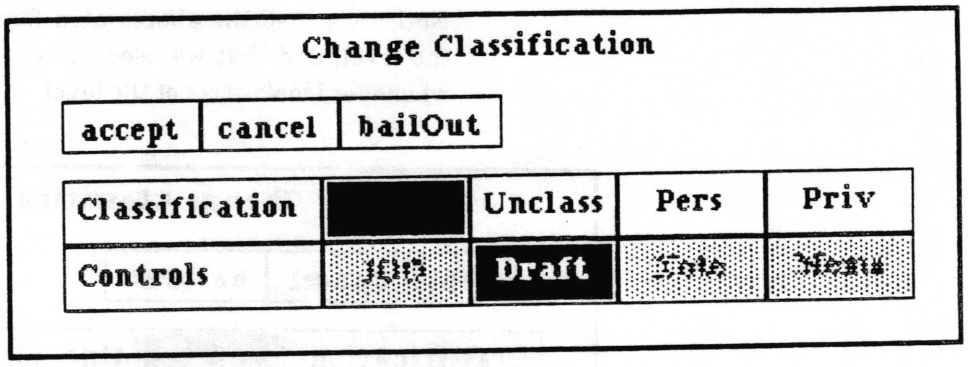
```
Draft ~ nil.
(Note Memo) ~ '' & Draft.
```

Notice that first we specify a rule for Draft. A modifier can not be used in an expression until it has had a rule explicitly defined for it. Assigning nil explicitly defines an empty rule for Draft.

Notice that a list is used, thus giving the same rule to both Note and Memo.

Notice that in order to specify the empty level, we used two single quotes. This is to tell the rule compiler that there is a level there, rather than just a couple of extra spaces. You will also need to use single quotes around any abbreviated form with spaces in it. You can use them around any modifier if you want, but they are only needed in the two cases just mentioned.

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Note and Memo are disabled because both the empty level and Draft are selected.

One last example:

Assume we want Note and Memo to be disabled whenever the level is Unclass and either Draft or IUO is in effect. The result:

(Note Memo) ~ Unclass & (Draft | IUO).

So in summary:

1. Rules look like: <ModifierOrList> ~ <expression>.
2. <ModifierOrList> looks like a modifier abbreviation or a list of abbreviations surrounded by parentheses.
3. Expressions are composed of modifier abbreviations, &, |, and not.
4. Parentheses can change the order of execution.
5. A modifier must have an explicitly defined rule before it can be used in an <expression>.
6. Empty levels and abbreviations with spaces in them must be surrounded by quotes.

Accepting, testing, and saving

Once you have specified (or altered) classifications, you need to accept them by using the accept command in the Rules pane. If you have changed the number of levels or modifiers, you must specify a new ID for the scheme when asked. The old ID will appear as a default, but you will be required to modify it. Otherwise, it will allow you to use the old ID. In general, the names of levels and modifiers and the rules may be changed without changing the scheme ID (in fact there is some advantage to this, see the next section for details), but if the number, order, or meaning of levels or modifiers is changed, you should change the scheme ID to a unique name that's never been used before. Incorporating the date in the ID is a very good idea.

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To test the scheme you have just accepted, use the test command from the Rules pane. This will bring up a standard Q-Box for testing your rules.

If the scheme meets your standards, you can make it into a classification scheme file by using the save command. This will ask for a file name, with a default of 'Classifications', which is the file Analyst will read automatically to get the classification scheme when using the "regular" file naming scheme. If you want this to be the default, simply accept or type a carriage return. If you want to save it as a different name, for MSDOS naming, or so it won't be the default, type the new name and then accept.

To use the new scheme on another machine, just put the new 'Classifications' or 'CLASSIFS' file on it. It will take effect with the next login to Analyst.

Automatic data conversions from old scheme to new

Information Centers, databases, outlines, and documents contain knowledge about the classification scheme in use when they were last saved. Basically, they know the scheme name, and the abbreviated and full name of each level and modifier used with a correspondence to the position it held in the scheme's level and modifier lists. The classification levels and modifiers of each data item, folder, database record, outline section, or document paragraph is kept only in terms of their list positions.

When one of these data types is opened, the name of the scheme it was saved under is compared to the name of the scheme currently in the system. If they are the same, it is assumed that the scheme did not change, and therefore the level and modifiers of each classification will be in the same position in the level and modifier lists as before. At a minimum, if the scheme ID is not changed, the number of levels and number of modifiers must be the same or errors (blow ups) will occur.

If the scheme names are different, the system will convert each classified entity (data item and folder, database record, outline section, document paragraph) by looking for the old abbreviation of each level or modifier in the new scheme. If the level or modifier abbreviation is found in either the abbreviations or full names in the new scheme, it will be used. If it is not found, it will look for the old full name of the level or modifier in the new scheme. A level which can not be found in the new scheme will be substituted for with whatever is the lowest level. An unmatched modifier will be dropped from the classification. Any and all linking information (rules) is ignored in this process.

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Data item types which do not contain knowledge of the classification scheme under which they were saved usually have a header field on their data file containing the abbreviated level and modifier names for their classification. This information is in addition to references to them from information centers. (Printer format files are the exception, they have no such header and rely on connection to an information center for retension of classification information). Usually, the classification information held in the data file will override the classification in an information center reference if they are different – on the assumption that they are different because the classification was changed through a reference to the file in a different information center (thus this reference is out of date and needs to be updated). However, if the abbreviated level and each modifier in the file header classfication cannot be matched in the current classification scheme, the classification in the information center reference will be retained – on the assumption that the difference is due to a classification scheme change and because the information center has more information at its disposal for converting the classification it is more likely to be correct.

Auditing user activity

Analyst contains an auditing feature which allows a System Administrator to monitor a users activity. The auditing is not complete. Only those things which a programmer has thought would be useful to know are logged, but it is a start, and it is easy for a programmer to add more data points. Some of the things noted in the log are the date and times of: user log in, user log out, idle start, idle stop, titles of windows opened and windows closed, some Information Center manipulations (centers opened, closed, items created, modified, cut), status of Background Printer, Outline manipulations. When auditing is in progress, the user may notice some decrease in the speed of the system.

Auditing is controlled by the options in the **System Control> audit controls>** branch of the System Administrator's screen middle mouse button menu. The user(s) to be audited are most easily designated by selecting **setup** from this menu. A list of all the users in the Analyst users list appears in a Q–Box. The user names which are selected (darkened) will be audited. Those which are not selected will not be. The **cleanup** menu item empties the audit log file. The **hardcopy** menu item will send the audit file to whatever the currently set printer name is. (It will not necessarily show up in the Background Printer, it takes a shortcut when it can).

When a user is being audited, the audit information is written to a file on the *<AnalystWorkingDirectory>*. This file is named

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either *AuditTails* or *AUDIT.LOG*, depending on the file naming scheme in use. This file will tend to get quite long when one or more users are being audited. This means that the System Administrator should check and cleanup this file frequently and that it may be painfully slow (or not possible on a Xerox workstation) to view the contents of the log in a File List. (On Xerox workstations, a file must be less than 64K long to be viewable in a Smalltalk FileList – use Tajo.)

Error log

The Analyst error log is a tool which can be a valuable aid in finding bugs and determining problem patterns when there are non–programmer users of Analyst. For the great majority of errors, users soon discover that they can either just try again or approach whatever they were doing a bit differently. So, generally, if something goes wrong and an error occurs, a user would much rather try to continue on than look for someone to tell about it who would either just write it down or spend a bunch of time debugging. The error log feature is a quick and convenient way of making a note about the problem.

If Analyst encounters a problem and presents a user with the question, "Do you want to debug?", non–programmer users should select *no*. At that point Analyst will ask about generating an error report. If *yes* is selected, a fill–in will appear to take input of a comment about what they were doing. After accepting that, the date and time, user name, the comment, and the full Smalltalk execution stack are written out to a file on the <AnalystWorkingDirectory>. That file is named either *AnalystError.log* or *ANLSTERR.LOG*, depending on the file naming scheme in use.

If lots of errors occur and users make a habit of generating error reports for them, this file could become quite large unless it is checked regularly and moved or deleted. If it has become very large, viewing the contents in a FileList may be painfully slow (or not possible on a Xerox workstation). (On Xerox workstations, a file must be less than 64K long to be viewable in a Smalltalk FileList – use Tajo. However, if the machine is on a network, Analyst will try to automatically send this file to a printer each time a user logs in, and then delete it if successful).

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Here is an example of one report in an error log file:

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
user: ellersieck    (15 October 1988 9:49:31 pm )
comments: I tried to compute (3 and: [4]) to produce this sample of an error report.
Stack:
Signal> >noHandler
Signal> >signal:
SmallInteger(Object)> >error:
SmallInteger(Object)> >mustBeBoolean
UndefinedObject> >DoIt
Compiler> >evaluate:in:to:notifying:ifFail:
StringHolderController> >doIt
StringHolderController(MouseMenuController)> >performTreeBackwards:
StringHolderController(MouseMenuController)> >performYellowSelections
StringHolderController(MouseMenuController)> >yellowButtonActivity
StringHolderController(ParagraphEditor)> >processYellowButton
StringHolderController(ParagraphEditor)> >processMouseButtons
StringHolderController(ParagraphEditor)> >controlActivity
StringHolderController(Controller)> >controlLoop
StringHolderController(Controller)> >startUp
StandardSystemController(Controller)> >controlToNextLevel
StandardSystemController(Controller)> >controlActivity
StandardSystemController(MouseMenuController)> >controlActivity
StandardSystemController(Controller)> >controlLoop
StandardSystemController(Controller)> >startUp
[] in ControlManager> >activeController:
[] in BlockContext> >newProcess
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

Usage of multiple disk directories

Analyst was originally designed on a machine which did not truly have any concept of multiple disk directories and/or multiple concurrent users on the same data, and it has not yet overcome those beginnings. Analyst basically expects all its data files to come from one directory or folder on the disk, the *<AnalystWorkingDirectory>*. There is also little protection from conflicts if more than one processor running Analyst is using the same *<AnalystWorkingDirectory>* at the same time. (There are plans to do something for both problems in future versions).

For these reasons, it is highly recommended that if users will be logging in from different processors simultaneously, each user run Analyst from their own directory, thus utilizing a different <AnalystWorkingDirectory> than the other users. This will also prevent problems with file permissions. (See "File permissions" section of this chapter). On Unix or UTek platforms, system and platform files which have fixed names and are truly

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read only (such as source code, on–line user guide, map data and hints, Analyst user list when not System Administrator), may reside in one location with soft–links to them from many places.

All the Analyst 3.0 implementations allow users to send files to one another through sub–directories/folders of a designated *<MailServerName>* directory, and to back up files to a different directory/folder. Details of setting up for use of these capabilities can be found in the "Moving files around" section of this chapter.

Moving files around

This section explains the facilities that Analyst has for assisting the movement of files to and from the *<AnalystWorkingDirectory>*, from and to other directories/folders, possibly on remote machines.

Terminology

always/update

The term *always/update* means to only move or copy a source file if it does not already exist at the destination (make sure it is *always* there) or has a newer modification date than the destination (*update*).

<AnalystWorkingDirectory>

<AnalystWorkingDirectory> is the directory, sub–directory, or folder where Analyst generally finds and creates all it's data files. In general, this means it is the directory, sub–directory, or folder in which the Analyst virtual image was started.

For example, on Unix, if your current working directory is '/ufs/demo/' when you issue the command to start up Analyst, that will be the *<AnalystWorkingDirectory>* until the time you quit Analyst, (regardless of whether you subsequently change the working directory while Analyst is running) unless you take extraordinary measures to change it (by carefully setting the global Disk to something else).

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<FileServerName>

<FileServerName> is used to specify a root location the users of Analyst may use to conveniently backup their data files and/or transmit data files to one another.

On Xerox machines, it must be the fully qualified name of an XNS file service, or the name of a Pup Server immediately followed by a percent sign.

On other machines, it must be the full path name of a directory, including the appropriate path separator character at the end.

<MailServerName>

<MailServerName> is a *<FileServerName>* defined in the *network information file* as the location to automatically be used for sending and retrieving files among users via **send selection** and **fetch new files**.

network information file

The *network information file* is a file which contains non user specific information about network facilities for the use of Analyst. It must be located on the *<AnalystWorkingDirectory>* at the time the Analyst is started from the operating system environment. If no file is found, a default file will be created.

The exact name of the network information file depends on the file system in use. Currently, on Sun, Macintosh, Tektronix, and Xerox workstations, the file name is *networkinfo*. On Apollo workstations (and any other workstations using a DataControlMSDOS DataMaster) the file is named *NETINFO*.

The network information file contains the type of network login, XNS domain, XNS organization, a list of *<FileServerName>*s, a optional setting of printer type (Interpress or PostScript), a list of *<PrintServerName>*s, and an optional *<MailServerName>*.

The file can be edited in any editor which will not alter the formatting or contents of the file on its own. The best way to insure this is to use a File List in Analyst. Each line must end with a carriage return (decimal ascii value 13), so depending on the platform Analyst is built on (Sun, Apollo, Tektronix), you will need to be careful to answer any questions regarding the conversion of linefeeds or line end characters that appear on **get** or **put** of the file so that *no* conversion occurs.

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file format

Here is the basic file format:

\\loginType
xns domain
xns organization
<list of <FileServerName>>
\\
<default print file format>
<list of <PrintServerName>>
\MAIL\
<FileServerName>

where:

each line ends with a carriage return

\ is the backwards slash character

loginType defines what should be done to try to log the user in on a Clearinghouse on an attached XNS network. Since this currently is possible only on Xerox machines, on any other machine, *loginType* should be NoNetPassword.

On a Xerox machine it may also be either AutoSetNetPassword or AskNetPassword. The possible values have the following meanings:

\\AutoSetNetPassword
The user will be logged into the network with their Analyst user name and password.

\\NoNetPassword
Nothing will be done. Use it either if the machine is not on a network, or the user will be sure to always log in properly in the Profile Tool or use **User Profile> network login** before trying to print or access the file server from Analyst.

\\AskNetPassword
Each time someone logs in, they will be presented with a second Q–Box to log in for the network. This is useful when the network name and/or password differs from the Analyst password. As a convenience, bailing out of the Q–box for this is equivalent to not setting the password.

xns domain the default XNS network domain of a user. This is specific to Xerox machines. On any other machine, the contents do not matter, but there must at least be a placeholding blank line. Unfortunately, this currently (September 1988) is not made use of by Analyst because there is no way to communicate this information to XDE from

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Smalltalk, which means it must be set correctly by the user.cm or in the profile tool.

xns organization the default XNS network organization of a user. This is specific to Xerox machines. On any other machine, the contents do not matter, but there must at least be a placeholding blank line. Unfortunately, this currently (September 1988) is not made use of by Analyst because there is no way to communicate this information to XDE from Smalltalk, which means it must be set correctly by the user.cm or in the profile tool.

<list of <FileServerName>> an optional list of *<FileServerName>*s which the user will be able to pick from in the **File Server Name** QBox. Each name in the list must be on a separate line (ie. separated by a carriage return).

<default print file format> this optional line may contain the word Interpress or the word PostScript. (For old software, it may contain Press). Use of this option will make sure that Analyst versions which can handle more than one printing type will be set to use the specified type.

<list of <PrintServerName>> an optional list of *<PrintServerName>*s which the user will be able to pick from to specify which printer to send hardcopy output to. Each name in the list must be on a separate line (ie. separated by a carriage return).

\MAIL\
<FileServerName>
these two lines are optional. If they exist, *<FileServerName>* will be used for sending an Information Center selection to another user and for fetching new files in the Scavenge Center. If this option is not used the user will be asked to select the service to send to/retrieve from).

path separator character

The path separator character is the character between portions of the path of a complete file name. For instance:

on Unix machines, the path separator character is a slash (/)
on Macintosh, the path separator character is a colon (:)
on Xerox machines, the greater than sign (>) is accepted by the XDE environment for both Pup and XNS servers, and for local subdirectories.

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<PrintServerName>

<PrintServerName> is used to specify the name of a print server the users of Analyst may send hardcopy output to.

On Xerox machines, it must be the fully qualified name of an XNS print service, or the name of a Pup print server immediately followed by a percent sign.

On Unix machines, it should be a name recognizable to the lpr command.

On Macintosh, the name does not matter. Output will go to whatever printer is set in the Macintosh operating system.

UserName

UserName is the Analyst log–in name of the currently logged in user.

Set File Server Name QBox

The **Set File Server Name QBox** requests the user to specify a *<FileServerName>* (see definition above).

The list of names in **File Server Name:** comes from the *network information* file plus any other names specified since the last quit of Analyst, (see below). The default selection will be, in order of priority:

the last name used
the name set by the user in **User Profile> file server name**
the first name on the list.

The **Fully qualified name:** fill–in will become active if **other** is selected from the list of names. Here the user may enter any name which would be valid to put on the list. It will subsequently be a part of the list until Analyst is quit. To put it on the list for a longer term, the System Administrator should edit the *network information* file.

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Direct movement via menu options

There are several menu options within Analyst which cause files to be moved or copied from one specified location to another. These were originally designed to be used in an environment where only batch transfer was/is possible from Smalltalk, and by users who may have no concept of directories or files or whatever is actually going on.

backup selection

This is used to copy all or a portion of the files of an Information Center to another location, generally for backup purposes. The Information Center is saved and all the files used by the data items in the current folder selection, plus the Information Center structure file, are copied by the Information Center folder middle mouse button menu option **maintenance> backup selection**. (Map vector data files are not included).

chronology

Selection of **maintenance> backup selection** from the middle button menu of an Information Center folder:

saves the Information Center the folder is in

gathers the names of all files in the current selection

presents the user with the **Set File Server Name** QBox in order to obtain the *<FileServerName>*

attempts to *always/update* copy each file to the location:

<FileServerName>UserName>BackupData>filename

where:

the greater than sign is the appropriate path separator character for the machine in use

BackupData is a directory/folder name (which will be created if necessary) within *<FileServerName>UserName>*.

filename is the name of the file on the *<AnalystWorkingDirectory>*.

SA setting up

There are a couple of things the System Administrator needs to do to allow this option to function.

Xerox On Xerox machines, the System Administrator needs to insure that each Analyst user *UserName* who will use this facility has read, add and write access to a directory/file drawer named *UserName* on a file server volume reachable via the network from the workstation.

The fully qualified name of that file server volume should be included as a *<FileServerName>* in the *network information*

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file, and if there is more than one such server, the user should be informed which one to use in conjunction with **backup selection**.

Other On non-Xerox machines, the System Administrator needs to create a directory/folder for each Analyst *UserName* who will use this facility. The directory/folder must be named *UserName*. The complete pathname of that directory/folder upto but not including the *UserName* should be included as a *<FileServerName>* in the *network information* file. If there is more than one *<FileServerName>*, the user should be informed which one to use in conjunction with **backup selection**.

In addition, on machines which have operating systems that have logged in user based file access protection mechanisms (ie. Unix or UTek), the System Administrator needs to insure that the operating system level identity of each Analyst user has permission to write to the corresponding directory/folder.

fetch copy selection

This is used to retrieve all or a portion of the files of an Information Center which have been previously "backed up" via **backup selection** to the *<AnalystWorkingDirectory>*. This is mostly useful to recover an older version of a file that has subsequently been messed up. It is limited in its capability because the desired file(s) must still be listed in the Information Center.

chronology

Selection of **fetch copy selection** from the middle button menu of the Scavenge Center:

checks the contents of the copy buffer to make sure it is a selection from an Information Center

gathers the file names from the selection

presents the user with the **Set File Server Name** QBox in order to obtain the *<FileServerName>*

checks for, and creates if necessary, a directory/folder/sub-directory in the current *<AnalystWorkingDirectory>* named *AnalystTransport>*

attempts to copy each *filename* in the selection from the location:

<FileServerName>UserName>BackupData>filename

to the location:

<AnalystWorkingDirectory>AnalystTransport>filename

where:

the greater than sign (>) is the appropriate path separator character for the machine in use

BackupData is a directory/folder name within

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<FileServerName>UserName> (the fetch will terminate if this does not exist).

filename is the name of the file itself

automatically recovers all files of all types which are located on the *<AnalystWorkingDirectory>AnalystTransport>* directory/folder and lists them in the Scavenge Center. (This means that other files which were previously fetched, but niether refiled or destroyed, will also be recovered).

From the Scavenge Center the files may be opened, refiled, or destroyed. Upon **refile**, if a copy of the file still exists in the *<AnalystWorkingDirectory>* the user will be asked whether to overwrite that copy. If the answer is no, the file of the refiled item will be renamed, and a new data item made and filed into the Information Center(s).

SA setting up

The requirements for **fetch copy selection** are the same as those for **backup selection**, except that it is necessary for the user to have read access to the *<FileServerName>UserName>BackupData>* directory/folder.

retrieving entire Information Center

This is a hidden option for users who know what they are doing to retrieve an entire Information Center and all its files from a *<FileServerName>UserName>BackupData>* directory/folder to the *<AnalystWorkingDirectory>* with one command. It can be dangerous, however, because files of the same name which already exist in *<AnalystWorkingDirectory>* will be overwritten.

To obtain this option, hold down the left–shift key while selecting **fetch copy selection** from the middle button menu of the Scavenge Center.

chronology

Selecting **fetch copy selection** from the middle button menu of the Scavenge Center while holding down the left–shift key:

brings up a confirmer with a warning about smashing data.

if *yes* is selected, brings up a fill in the blank request for the name of the Information Center to retrieve. This name must match exactly (upper and lower case included) the name of the Information Center to be retrieved.

presents the user with the **Set File Server Name** QBox in order to obtain the *<FileServerName>*

attemps to copy the Information Center's structure file from the directory/folder *<FileServerName>* *UserName>*

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BackupData>

uses that to figure out all the file names the center uses directly

copies all the files to *<AnalystWorkingDirectory>*

checks for any files referenced by the files retrieved and copies them to *<AnalystWorkingDirectory>*

returns control to the user

If the Information Center was not already in the Information Center list, the user will need to log out and back in before it will appear. If it was already in the list, the user should use **maintenance> restore info center** on it to insure that the copy in memory matches the retrieved copy.

SA setting up

The requirements for **fetch copy selection** of an entire Information Center are the same as those for **backup selection**, except that it is necessary for the user to have read access to the *<FileServerName>UserName>BackupData>* directory/folder.

backup user

This is used to copy the user specific files which are not a part of information centers to another location, generally for backup purposes. The files (the exact names of which depend on the file system being used) are:

user configuration file
idle image file
scratch pad file
function keys file

chronology

Selection of **User Profile> backup user** from the middle button menu of the system middle mouse button menu:

presents the user with the **Set File Server Name** QBox in order to obtain the *<FileServerName>*

attempts to *always/update* copy each file to the location:

<FileServerName>UserName>BackupUser>filename

where:

the greater than sign is the appropriate path separator character for the machine in use

BackupUser is a directory/folder name (which will be created if necessary) within *<FileServerName>UserName>*.

filename is the name of the file on the *<AnalystWorkingDirectory>*.

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SA setting up

There are a couple of things the System Administrator needs to do to allow this option to function.

Xerox On Xerox machines, the System Administrator needs to insure that each Analyst user *UserName* who will use this facility has add and write access to a directory/file drawer named *UserName* on a file server volume reachable via the network from the workstation.
The fully qualified name of that file server volume should be included as a *<FileServerName>* in the *network information* file, and if there is more than one such server, the user should be informed which one to use in conjunction with **backup user**.

Other On non–Xerox machines, the System Administrator needs to create a directory/folder for each Analyst *UserName* who will use this facility. The directory/folder must be named *UserName*. The complete pathname of that directory/folder upto but not including the *UserName* should be included as a *<FileServerName>* in the *network information* file. If there is more than one such pathname, the user should be informed which one to use in conjunction with **backup user**.

In addition, on machines which have operating systems that have logged in user based file access protection mechanisms (ie. Unix or UTek), the System Administrator needs to insure that the operating system level identity of each Analyst user has permission to write to the corresponding directory/folder.

restore user

This is used to retrieve the user specific files which have previously been backed up via **backup user** from the backup location. The files retrieved (the exact names of which depend on the file system being used) are:

- user configuration file
- idle image file
- scratch pad file
- function keys file

chronology

Selection of **User Profile> restore user** from the system middle mouse button menu:

presents the user with the **Set File Server Name** QBox in order to obtain the *<FileServerName>*

attempts to copy each *filename* in the list from the location:

<FileServerName>UserName>BackupUser>filename

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to the location:

<AnalystWorkingDirectory>filename

where:

the greater than sign (>) is the appropriate path separator character for the machine in use

BackupUser is a directory/folder name within *<FileServerName>UserName>* (the fetch will terminate if this does not exist).

filename is the name of the file itself

automatically reinitializes the user environment according to the contents of the configuration and idle files.

SA setting up

The requirements for **restore user** are the same as those for **backup user**, except that it is actually only necessary for the user to have read access to the *<FileServerName>UserName>BackupUser>* directory/folder.

send selection

This is used to send copies of one or more Information Center data items to one or more users whose machines can access a common *<FileServerName>*.

All the files used by the data items in the current folder selection are copied to another directory by the Information Center folder middle mouse button menu option **maintenance> send selection**. (Map vector data files are not included).

chronology

Selection of **maintenance> send selection** from the middle button menu of an Information Center folder:

gathers the names of all files in the current selection

unless a *<MailServerName>* is defined, presents the user with the **Set File Server Name** QBox in order to obtain the *<FileServerName>*

presents the user with a QBox containing the names of all the users in the Analyst user list on the *<AnalystWorkingDirectory>*. The user may select one or more of the names, including his own.

for each selected user name, attempts to *always/update* copy each file to the location:

<FileServerName>SomeUserName>filename

where:

the greater than sign is the appropriate path separator character for the machine in use

SomeUserName is a directory/folder name within *<FileServerName>*

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filename is the name of the file on the *<AnalystWorkingDirectory>*.

SA setting up

There are a couple of things the System Administrator needs to do to allow this option to function.

Xerox On Xerox machines, the System Administrator needs to create a file drawer/directory named *AnalystSupport* on a file server volume reachable via the network from the workstation. The SA then needs to insure that each Analyst user *UserName* who will use this facility has read, write, add and remove access to that directory/file drawer. (It turns out a bug in XDE prevents writing or adding a file to a folder to which a user does not also have read access).

The fully qualified name of that file server volume should be included as a *<FileServerName>* in the *network information* file, and if there is more than one such server and *<MailServerName>* is not defined, the user should be informed which one to use in conjunction with **send selection**.

Other On non–Xerox machines, the System Administrator needs to create a directory/folder for each Analyst *UserName* that files will be sent to. The directory/folder must be named *UserName*. The complete pathname of that directory/folder, upto but not including the *UserName*, should be included as a *<FileServerName>* in the *network information* file. Unless a *<MailServerName>* is defined, if there is more than one *<FileServerName>*, the user should be informed which one to use in conjunction with **send selection**.

In addition, on machines which have operating systems that have logged in user based file access protection mechanisms (ie. Unix or UTek), the System Administrator needs to insure that the operating system level identity of each Analyst user has permission to write to the directory/folder corresponding to each *UserName* he/she will be allowed to send to.

fetch new files

This is used to retrieve Information Center data items that have been sent to the user via **send selection**.

chronology

Selection of **fetch new files** from the middle button menu of the Scavenge Center:

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unless a *<MailServerName>* is defined, presents the user with the **Set File Server Name** QBox in order to obtain the *<FileServerName>*

checks for, and creates if necessary, a directory/folder/sub–directory in the current *<AnalystWorkingDirectory>* named *AnalystTransport>*

attempts to move each file *filename* from the location:

<FileServerName>UserName>filename

to the location:

<AnalystWorkingDirectory>AnalystTransport>filename

where:

the greater than sign (>) is the appropriate path separator character for the machine in use

UserName is a directory/folder name within *<FileServerName>* (the fetch will terminate if this does not exist).

filename is the name of the file itself

automatically recovers all files of all types which are located on the *<AnalystWorkingDirectory>AnalystTransport>* directory/folder and lists them in the Scavenge Center. (This means that other files which were previously fetched, but niether refiled or destroyed, will also be recovered).

From the Scavenge Center the files may be opened, refiled, or destroyed. Upon **refile**, if a copy of the file still exists in the *<AnalystWorkingDirectory>* the user will be asked whether to overwrite that copy. If the answer is no, the file of the refiled item will be renamed, and a new data item made and filed into the Information Center(s).

SA setting up

There are a couple of things the System Administrator needs to do to allow this option to function.

Xerox On Xerox machines, the System Administrator needs to create a file drawer/directory named *AnalystSupport* on a file server volume reachable via the network from the workstation. The SA then needs to insure that each Analyst user *UserName* who will use this facility has read access to that directory/file drawer.
The fully qualified name of that file server volume should be included as a *<FileServerName>* in the *network information* file, and if there is more than one such server and *<MailServerName>* is not defined, the user should be informed which one to use in conjunction with **fetch new files**.

Other On non–Xerox machines, the System Administrator needs to create a directory/folder for each Analyst *UserName* that files will be sent to. The directory/folder must be named *UserName*. The complete pathname of that directory/folder, upto but not

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including the *UserName*, should be included as a *<FileServerName>* in the *network information* file. Unless a *<MailServerName>* is defined, if there is more than one *<FileServerName>*, the user should be informed which one to use in conjunction with **fetch new files**.

file name list

The menu item **maintenance> file name list** in the middle button menu of an Information Center folder finds the disk file names of all the data items in the current selection and opens a window on the list. The file names are separated by spaces.
This list can be edited as necessary and used as part of a command file or script to move or rename the files in ways which are not handled by the backup or send features.

Packages

The *package* type data item is simply a file which contains one or more other files. It is very useful for moving lots of files around at one time and/or keeping a related bunch of files together.

Creating packages

Package data items can be created containing data items from an Information Center through use of a menu command, or they can be created containing any list of files by sending a message to DataMaster.

From Information Center

A package data item containing all the files in an Information Center folder selection, plus the Information Center structure file, is created by holding the left–shift key down while selecting **maintenance> backup selection**. The user is asked for confirmation that a package is to be created. Answering *no* causes the normal backup sequence to be continued.

A *yes* answer will cause a question regarding the inclusion of map data files to appear. A *yes* answer will cause the vector data files of any maps included in the selection to be included in the package; a *no* answer will leave them out. Because these files are frequently very large, are not created by individual users, and are often a shared resource among many users, it is often not desirable or reasonable for each user to be backing them up or passing them around.

After the map data file question is answered, the package is created. The file and data item will automatically be named

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according to the selected item. It is not filed away into an Information Center, it is simply left in the *<AnalystWorkingDirectory>* where it can be recovered in the Scavenge Center and refiled or moved using the facilities of the operating system.

From collection of file names

A package data item may be created containing any list of files by sending a message to DataMaster. To do this:

a. Make a list of the file names, using whatever resources are available to you (File List, file name list, etc.), separating the names either by spaces or carriage returns.

b. Put single quote marks around each file name in the list.

c. Replace the dummy list in the following example with your list.

d. Replace the dummy label in the following example with your desired label.

e. Select the result of your replacements (from the start of DataMaster through the quote after the label) and evaluate it using either **do it**, **print it**, or **compute it**. If you have the Transcript open while doing this, any file which is not found will be reported.

```
DataMaster createPkgFileForFiles:
#(
'filename1'
'filename...'
'filenamen'
) withLabel: 'the package label'.
```

The resulting package data item file will be created and left on the *<AnalystWorkingDirectory>*. From there you may either recover it in the Scavenge Center or use whatever operating system tools are available to move it elsewhere.

Unpacking packages

Unpacking a package data item file means to split out the files it contains into separate files. The package file itself is not changed. If one of the files it contains is already on the disk, it will be overwritten.

To unpack a package data item file, simply **open** it in an Information Center folder. (The usual place for this would be in the Scavenge center after recovering it, which also makes it convenient to destroy it afterwards). Upon **opening** a package

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data item, the user is requested to confirm unpacking it, and then is presented with a fill-in-the-blank to enter the name of the directory to put the files into. To put the files in the *<AnalystWorkingDirectory>*, simply leave it empty and type a carriage return. If you want it on a different directory, type in a complete pathname (including the path separator character on the end) for that directory.

Font mapping in the Document System

Analyst contains a new scheme for font mapping which is different from that of Smalltalk. Currently this font mapping is used only by the Document System and printing (HardcopyMedium). This makes it fairly easy to add to, change, mix and match the fonts used by the Document System - especially which printer fonts are used by PostScript printing.

How it works

There is an instance of the Smalltalk class FontCenter in Analyst which is kept in the global variable FontMaster. It holds the various forms of fonts used for display on the screen and printing and takes care of the mapping between them. When it is initialized, it expects to find a file named 'font.map' on the *<AnalystWorkingDirectory>* which defines the mapping between:

1. Each possible rendering device type and a Smalltalk class which reads, saves and utilizes the font information necessary for use of that device. For instance, StrikeFont is used for displaying on the screen. It holds a Form containing the looks of each character, and an Array with the location of each character in the Form. PostScriptFont is used in the creation of PostScript files, it just knows what the width of each character is so the placement of characters horizontally on a line can be done correctly; the printer takes care of what they actually look like.

2. An array index used internally to get around in the map and the run arrays of the document. This index is also what is used to designate each font when the document is stored. Documents save the mapping of this index to the generic font name (see 3) so that existing Documents can be fixed up if you change the order of entries in the mapping.

3. The generic name of the font. This non-trademarked, non-device specific name is used on the menus for accessing the font and is meant to be the key name.

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4. The names of files or entries in a file containing the data necessary for each rendering device for four (currently) basic font looks: normal, bold, italic, and bold italic. The currently handled device types are Display (what is used for galley mode), Interpress (used for Xerox Interpress print files), HardcopyDisplay (what is used for wysiwyg mode), and PostScript (what is used for creating PostScript files).

In the case of the two types of Display, each name is expected to correspond to the name of a strike format font file, which must either already be in memory (either in the existing FontMaster or in a TextStyle) or be available on the disk during initialization. Interpress initialization requires a file named 'Interpress.widths', and PostScript requires a file named 'PostScript.widths'.

It is not necessary for the type sizes or faces to correspond at all with each other between the device types. For instance, you may wish to deliberately use a larger type face for Display (galley mode) than what will be printed, especially with smaller fonts which may be hard to see. Generally, the font used for HardcopyDisplay is the next smallest available font. This is because display font characters tend to be wider than the corresponding printer font characters (due to the limitations of resolution) and thus using the same size causes lots of overlap between the characters in wysiwyg.

If only PostScript, or only Interpress will be used, the lines listing the other type may be left or commented out. (A line is commented out by putting an * as the first character in the line).

How to add a font

1. Make sure you have the necessary printer widths.

   For PostScript, the current 'PostScript.widths' file contains all the necessary information for any size of TimesRoman, Helvetica, or Courier.

   If you wish to use a different type face, you will need to add its widths to the 'PostScript.widths' file. It turns out that these widths are readily available to users of ParcPlace Systems Smalltalk because they are contained in the printer width files supplied with it (AFM*). They are also easily obtained from other sources. Obtain the required AFM file, and then add its widths to the 'PostScript.widths' file by evaluating the expression: "PostScriptFont convertAFM: '<AFMfilename>'", where <AFMfilename> is the name of the file.

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For Interpress, if the current 'Interpress.widths' file does not contain the widths for the specific font face, size, and type desired, it is necessary to obtain the specific .widths file (converted with special code from an old STAR or Interpress width format file) and use the command "InterpressFont addToWidthsFile: '<AFMfilename>'". In the case where such a file is unavailable (or even if it is, if the font is not available on the printer), you must use some other font which is available.

2. Edit 'font.map'.

   Open a File List on the file. Note: It will not work with linefeeds instead of carriage returns – you must be sure not to convert them when doing your editing (see the section "Direct editing of files").

   An existing entry of a generic font can be edited in place, but if you are adding a new entry, it would be best to put it on the end of the list so that existing documents won't have to go to much trouble converting. Copy a section of a similar type face, paste it at the end of the file, change the index to the next sequential number, and fix up the sizes of the fonts for each device.

3. Initialize a new FontMaster.

   After saving 'font.map', close down any open documents and execute the following six lines of code to initialize a new FontMaster and update the other classes that use it.

   ```
   FontCenter initialize.
   DocumentEditor initFontMenu.
   DocumentEditor initialize.
   DocumentDisplayScanner initialize.
   DocumentCharacterBlockScanner initialize.
   DocumentCompositionScanner initialize.
   ```

4. You should now be able to open a Document and find that the font changes have occurred. The font menu will get ugly with font sizes larger than 18. If it is important enough, this can be remedied by creating the menu using a TextStyle with a larger line grid (the menu Form must be created with the larger gridded TextStyle, and that same grid number must be provided to the menu initialization). That would of course mean that all the menu items would be spread apart more.

5. Remember that if you quit without saving the image after making these changes, you will need to execute the initialization code in 3 again before you will be able to use documents utilizing the font changes.

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Glossary

<AnalystWorkingDirectory> *<AnalystWorkingDirectory>* is the directory, sub–directory, or folder where Analyst generally finds and creates all it's data files. In general, this means it is the directory, sub–directory, or folder in which the Analyst virtual image was started.

<FileServerName> *<FileServerName>* is used to specify a root location the users of Analyst may use to conveniently backup their data files and/or transmit data files to one another. On Xerox machines, it must be the fully qualified name of an XNS file service. On other machines, it must be the full path name of a directory, including the appropriate path separator character at the end.

<MailServerName> *<MailServerName>* is a *<FileServerName>* defined in the *network information file* as the location to automatically be used for sending and retrieving files among users via **send selection** and **fetch new files**.

bitmap An image or picture. The representation in memory for a rectangular area of pixels (screen dots). Each pixel is represented by 1 bit in memory. A WordArray.

DataMaster A global variable in Analyst which contains an instance of DataControl or DataControlMSDOS. Among other things, it handles the mapping of file name to file type.

Finder A single task operating system application which creates and maintains the Macintosh computer desktop. The name is a trademark of Apple Computer, Inc.

Interpress A printer file format developed by Xerox which is used primarily by Xerox machines. A trademark of Xerox Corporation.

interpreter The virtual machine portion of a Smalltalk–80™ platform. The interpreter reads a Smalltalk virtual image file and interprets (executes) the code in it. It operates as an application or tool in the operating system environment.

MultiFinder A multitasking operating system application which creates and maintains the Macintosh computer desktop. The name is a trademark of Apple Computer, Inc.

Package An Analyst data type which contains one or more other files. It is useful for moving lots of files around at one time and/or keeping a related bunch of files together.

PostScript A printer file format developed by Adobe Systems, Inc. The name is a registered trademark of Adobe.

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Tajo The runtime environment of XDE. The usual environment for running Smalltalk on Xerox 6085/1186 and 8010/1108/1109 workstations.

Unix An operating system available on many different computers, including those of Sun Microsystems, Inc. Unix is a registered trademark of AT&T Information Systems.

XDE Xerox Development Environment. A software environment that provides development tools for programmers to use in writing more tools and applications in the Mesa language. It is only implemented on Xerox machines.

XNS Xerox Network Systems. A system of layered protocols developed and used by Xerox for communication between computers over one or more Ethernet cable(s).

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Analyst User Guide GLOSSARY

absolute — See cell reference

accept — The first of three command choices on a QBox window. Selection of accept indicates that the user is satisfied with the settings and entered values and wants the system to proceed.

access window — The Information Centers access window provides the user access to all existing Information Centers, the Scavenge Center, and the means for creating new centers. This is the window that is opened when the user selects **Information Centers** from the screen middle mouse button menu.

active — When a looks formatting property (either character or paragraph) is active, its value will be applied to the current selection.

add column — A second level menu command from the utilities> branch of the cell middle button menu in the spreadsheet. Selection causes two prompters to appear: the first asks for the number of columns you want to add; the second asks you to specify the column after which the addition should be made.

add row — A second level menu command from the utilities> branch of the cell middle button menu in the spreadsheet. Selection causes two prompters to appear: the first asks for the number of row you want to add; the second asks you to specify the row after which the addition rows should be inserted.

address mode — One of three buttons under the cell area on the spreadsheet. The default mode is an absolute reference between cells. Relative reference can also be selected.

after — A term describing a relative position in an outline structure. The first entry below another entry at the same indentation level as that entry.

alignment — Document System: The arrangement of the lines of text between the left and right indents of a paragraph. There are four possible alignment choices: left, right, centered, or justified. May also refer to tab alignment.
Forms: Determines where the text will be displayed relative to the left and right edges of the element in one of three choices, LeftFlush, Centered, or RightFlush.

<AnalystWorkingDirectory> — *<AnalystWorkingDirectory>* is the directory, sub-directory, or folder where Analyst generally finds and creates all it's data files. In general, this means it is the directory, sub-directory, or folder in which the Analyst virtual image was started.

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animate To display a sequence of positional information on a map, thus simulating motion through time.

annotation A note, such as an editorial comment or bibliographic reference, referenced in text by an inserted annotation marker. Also a marking or notation placed on a map.

automatic scaling This chart parameter determines whether the scaling of the y–axis will be figured out automatically each time the chart is drawn. If it is false, the user will be asked to provide the scaling parameters each time the chart is drawn.

axes The numbered boxes displayed horizontally and vertically along the top and left edges of a Spreadsheet. Used to display column and row indices, one per box.

background A type of processing which allows the user to continue interacting with the Analyst while the background task is being completed. Printing is often done in the background to allow the user to continue working during the hardcopy process.

backwards link Information Centers: For each link between items, the system creates and maintains a *backwards link* so that each item can determine all the items which have links to it. The structure tree browser and some link menus allow the user to follow these links.

bail out The QBox command indicating that the user wants to abort the current action.

baseline Document System: Imaginary line through text upon which all letters without descenders appear to rest.
Forms: Where the text baseline will be placed relative to the top of the line, expressed in pixels.

before A term describing a relative position in an outline structure. An entry above another entry at the same indentation level.

binary operation A mathematical function operating on two numbers. Addition, subtraction, multiplication or division are binary operations.

bit The smallest unit of resolution in an image. One pixel (picture element).

bitmap An image or picture. The representation in memory for a rectangular area of pixels (screen dots). Each pixel is represented by 1 bit in memory. A WordArray.

body text The main body of text in a document, as opposed to the text of headings, headers, and footers.

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boolean A type of object whose values are either true or false.

border Forms: Determines whether a one pixel wide border will be displayed around the edges of the element.

brush Sketch Editor: The activity of the cursor in the edit pane which can be varied in function, shape, size, color and method of application. Used to create and edit pictures in the edit pane.

button pane Sketch Editor: The pane under the edit pane containing five buttons (Activity, Brush, Color, Grid, and Mode), each with its own middle mouse button menu, used to modify the brush.

cancel Abort the current operation without saving any changes. The QBox command indicating that the user wants to reset the QBox values to their default settings.

caret A small arrowhead used to mark an insertion point for new text. There is no caret when the selection is non-empty.

carriage return The key used by the document system to indicate the end of a paragraph.

carriage scale A measuring scale at the bottom of the paragraph menu, which is used to locate indents, margins and tabs.

cell The basic element of a spreadsheet arranged into a two dimensional array indexed by row and column. Cells contain values that can be computed dynamically from user-specified rules that may reference values from other cells.

Each cell of a Spreadsheet can hold any Smalltalk-80 object, including images, databases, popup menus, and files. New functionality added to the software system is automatically accessible by Spreadsheets without modification to the Spreadsheet application software.

cell boundary A horizontal or vertical line in the Spreadsheet which separates one cell from another.

cell reference Address mode of the cells to which rules are referred. There are three modes: absolute, where both the row and column value of the cell are given as a absolute number; relative where both the row and column values relate to the value of another cell indexed from the cell in question; and mixed where the row [or column] has an absolute address and the column [or row] has a relative address.

character face A detail of the shape of characters. Three varieties of face are available: *serif* has small attachments at the upper and lower ends of the strokes of characters, *sans-serif* does not have the attachments, and *fixed-width* has a fixed width common to all characters.

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character style A named set of character looks.

character type A detail of the shape of characters. Four varieties of type are available: **Bold**, *Italic*, Underline, and ~~Strikethru~~.

chart data window A window used to enter and/or modify the chart data.

choice A type of form element which provides a menu of the possible values of the element for the user to choose from.

classification A labelling associated with text or graphics, which signifies its required degree of protection against un – authorized disclosure.

classification bars Bands displayed horizontally across the top and bottom of a window, displaying the required degree of protection assigned to the item in white lettering on a black background when the window is active.

clear Middle button mouse command for a cell in a spreadsheet which sets the value to empty and blanks the rule for every selected cell. To implement select the cell or group of cells that you want to clear and then select the clear command from the cell mouse middle button menu.

click Press and immediately release a mouse button without moving the cursor.

clipboard The main data path in the Analyst. All copy, cut, and duplicate operations place an item, or a reference to an item, on the clipboard. During a paste, the item is removed from the clipboard and placed in a folder or center.

code Forms: A type of form element which makes something happen when it is selected with the left mouse button while in user mode. The element contains a piece of Smalltalk code which is executed when the element is selected.

column Vertical array of cells in a spreadsheet.

column break A paragraph formatting property which breaks a column either before or after the paragraph. If there is only one column on a page or it is the last column it is the same as a page break.

column indices Sequence of numbers which are in the first unnumbered row beneath the heavy border on the top of the spreadsheet; designates the column reference number.

columnNumber A function used in writing Spreadsheet rules to return the column number of the cell the rule is in.

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command bar

In spreadsheets the command bar, at the very bottom of the spreadsheet window is used for displaying, specifying, and editing the value, label and rule of the selected cell. It is very much like a typical text window in that you can do some of the usual text editing things with the middle mouse button popup menu.

In Information Center folders the command bar is the row of five selection boxes or buttons found in the top region of a folder window. Access to the in box, trash, sort keywords and direct is provided from the command bar.

command buttons

Document System: A selection of menu items from the Character Looks and Paragraph Looks menus, plus some utilities, arranged in a button pane above the text window. A button is activated by clicking the left mouse button with the cursor over the button name.

compress

To remove old versions of text from an Outline file.

concatenate

Outline: Append.

confirmer

Allows the user to reconsider a potentially destructive step and asks a *yes/no* question about whether to proceed or abort the operation.

connection

Any link or association between data items. Connections can be keywords, folders containing an item, or user specified relationships.

contains link

A type of link that links an Information Center folder to the data items and/or folders inside it. The contains links define the hierarchical structure within an Information Center.

contents list

The list of all of the data items and folders found within a folder. The icon and label of each item in the folder is displayed in the contents list.

control buttons

Under the spreadsheet cells are three rectangular control buttons that are set to the default words "value," "absolute," and "auto update." "Value" refers to the value/rule/label button. "Absolute" refers to the address mode button. "Auto update" refers to the update mode button.

copy

To place a reference to an item on the clipboard. This reference can then be pasted into another folder or any window that accepts it. A new data item is not created during a copy.

copy buffer

A copy buffer used within an outline the same way the clipboard is used by most other tools.

cross references

An item may be located in more than one folder within an Information Center and also may be in more than one Information Center. The cross references of an item are all the folders that this item is stored in.

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cursor A small pictorial shape displayed on the screen whose position is controlled by moving the mouse. It assumes a variety of shapes to facilitate user interaction and to indicate system status.

cut To remove a selected item from its folder and place it on the clipboard. If the item is not referenced elsewhere in the Information Center, it will be retained in the trash folder.

data item The basic unit of information stored in an Information Center. A data item is stored in a separate file or files and is displayed in its own window. A data item is of a particular type, such as text, image, map, document, or database.

data link A symbol in text representing a connection to the indicated item located in an Information Center.

data point Map Editor: A map location having a database record of information associated with it.

database An Analyst database item.

database link A link type provided by the system which is used only for connecting Map data items to Database data items.

DataMaster A global variable in Analyst which contains an instance of DataControl or DataControlMSDOS. Among other things, it handles the mapping of file name to file type.

date Database: A day, month, and year. It may be entered in several formats, but currently it is always displayed in the format *23 December 1987*. If no date is entered in a date field, the Database will display it as *unknown date*. Some of the forms a date may be entered in are:

day monthName year	eg. 5 April 1982; 5 – APR – 82
monthName day year	eg. April 5, 1982; apr 5 82
monthNumber day year	eg. 4/5/82; 4 – 5 – 82

decimal degrees Map Editor: A way of expressing latitude or longitude where the minutes and seconds are expressed as a decimal fraction of a degree. For example, 40 degrees, 30 minutes is 40.5 degrees.

default A setting or value used for a starting or reference point. The default brush is a square with a four pixel width.

degree Map Editor: A unit of angular measurement. One 360th of the circumference of the globe.

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delimiter Text: A pair of delimiters encloses an entire text entity which can be selected with a double click action at either end. Delimiters are spaces (for words), returns (for paragraphs), parentheses, double quotes, square brackets, angle brackets.

details Spreadsheet: Cell middle mouse button command which opens the spreadsheet upon which the selected cell's value is dependent.

direct Information Center: A command bar button which provides opening access to all of the items within the hierarchy of a center or folder by means of scrolling tree menus.

display links A cell middle mouse button menu selection from the utilities > branch which causes lines to be drawn from the selected cell to all cells that either depend upon or supply data to the selected cell.

dist/bearing Map Editor: A way of expressing the position of one data point relative to another data point in terms of a distance in nautical miles and a bearing of so many degrees on a compass.

double click Click the left mouse button twice in rapid succession without moving the cursor.

dump selection A command executed from an Information Center's trash folder that discards a data item from the center. The item is retained on the disk and is still accessible from any other center it is in, or from the scavenge center.

duplicate To create a new version of a data item that can be modified without affecting the original. The duplicate is a separate data item, and it can be pasted into any folder or center.

edit mode The Forms mode in which the form editor middle mouse button menu is available. This menu provides operations to create, modify and remove form elements.

editing pane That part of the window where an image or sketch is viewed and edited.

element An entity in a Form. A form element occupies a rectangular area on a form, known as its *box*. It has a name and some properties or parameters which determine how it is displayed and how it interacts with a user. The set of parameters is determined by the *type* of the element.

enabled Determines whether the Form element may be modified by a user when the form is in user mode.

endnote Document System: A note, such as an editorial comment or bibliographic citation, referenced in the text by an inserted endnote marker, and which may be printed at the end of the document.

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endnote marker

A sequentially assigned number shown on the display and hardcopy surrounded by a box. It is used to reference an endnote. By selecting it, a menu can be obtained to edit the endnote.

endnote window

A window with most of the features of the Document System which is used for writing and editing endnotes.

entry

A data item having a name, a position in the outline structure, and usually, one or more paragraphs associated with it.

erase

To make part or all of the bits of an image white.
A mode button setting which causes the black bits of the brush to turn the bits white in the image where it is applied.
An editing pane menu selection which may be used to erase the entire image.

esc for control

A notification which appears when the background printer has been told to work in the foreground. It can be made to work in the background again by typing the esc key.

execute

Forms: A type of form element which makes something happen when it is selected with the left mouse button while in user mode. The element contains a Smalltalk message selector which is sent to the form controller when the element is selected.

expand

Redisplay a collapsed window in its open size and location on the display screen.
Forms: To increase the area of the form available for placement of form elements.

field

A portion of a database record which has a name, length, and data type.

field label

Document System: The name of a field in the Character Looks or Paragraph Looks menus. Clicking on this part of the menu activates or deactivates the item.

field value

Document System: The current setting of a Character Look or Paragraph Look item. Selecting on this part of the menu allows the user to change the parameter setting.

FIFO

A user settable property for the clipboard, it means that the clipboard is treated as a first in first out stack, i.e. the first item copied into the clipboard will be the first item taken out during a paste operation.

file server

A storage device that is usually shared by several Analyst users. It may a Xerox file service or simply a Unix directory or Macintosh folder. A file server is used to backup data items and to send items between workstations.

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<FileServerName> *<FileServerName>* is used to specify a root location the users of Analyst may use to conveniently backup their data files and/or transmit data files to one another. On Xerox machines, it must be the fully qualified name of an XNS file service. On other machines, it must be the full path name of a directory, including the appropriate path separator character at the end.

fill Image Editor: To cause a color or pattern to occupy an enclosed area, such as a bar in a bar chart.

fill in A type of Form element which a user can type into when the form is in user mode.

Finder A single task operating system application which creates and maintains the Macintosh computer desktop. The name is a trademark of Apple Computer, Inc.

fixed – width A character face in which all characters have the same width.

float The designation for the value a real number.

flow order Document System: The sequence in which text will be printed into the body area boxes, in a page layout style.

folder A user created container for a set of data items within an Information Center.

font A complete assortment of characters of one size, one style and one design.

footer A string of characters that appears at the bottom of every page within a document.

footnote A note, such as a bibliographic citation, referenced in the text by an inserted footnote number and printed at the bottom of the page.

footnote reference A sequentially assigned number shown on the display as a superscript character, which is used to reference a footnote. This reference can be selected to obtain a menu which provides access to a window for editing the footnote.

footnote window A window with most of the features of the Document System which is used for writing and editing footnotes.

format Form and layout of document. General shape, size, type area, margins, and overall appearance of page.

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frame

The right button menu command which allows one to expand or contract the size of an application window.
The area enclosing a graphic in a document.
To enclose within a rectangle. A menu selection enabling areas on the screen to become the brush image.

galley display mode

Document System: The normal editing mode of text display on the screen. It is faster and more legible, but lacks some formatting details of the wysiwyg display mode.

global style

Document System: The lowest style in the hierarchy. A style which comes either from a style sheet or the default. The look of a global style is used when the style has not been redefined locally (for the particular document), and the look has not been changed and applied with the Paragraph or Character Looks menu.

graphics pad

Screen middle button menu choice that provides convenient access to a new sketch or chart editor.

grid

Sketch Editor: The invisible x and y (horizontal and vertical) axes in the edit pane which can be used to position images with more accuracy.

gridding

Forms: Gridding is provided to simplify editing, positioning and sizing elements. It forces all of those operations to be done in multiples of screen pixels.

gutter

Chart Editor: The distance in screen pixels between bars in a bar chart or sets of bars in a cluster bar chart.

hardcopy

Machine output in permanent form, such as paper – printed reports, listings, etc.

hardcopy tool

The tool which handles all printing in the Analyst. It supports background printing, which does not interrupt further activity by the user, or foreground printing for documents which must be printed as quickly as possible.

header

Document System: A string of characters that appears at the top of every page within a ocument.

hide

Outline: To conceal a subentry in an outline.

highlight

To display in reverse video the selected portion of the document on the display screen, or a menu selection.

hit

A database record meeting some requirement.

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hit list

Database: A list of hits. An ordered set of records in the database which meet some common requirement. The requirement may be as simple as being a nondeleted record in the database (hit list generated by show all records), or a complex combination of field values (hit list generated by queries).

holder

A temporary container for display and access to a set of data items. For example, the results of a keyword search or retrieval are displayed in a holder.

host

Any computer that is accessed by users and serves as a source of high – speed data processing for workstations with less computer power. Commonly referred to as mainframe, as opposed to workstation or service.

icon

The symbols or pictures used to graphically represent the various types of items. Each item type (folder, text, map, etc.) has its own unique icon.
Sketch Editor: A brush button menu option providing access to a list of icons.

idle

When no user activity has occurred for a period of time, or when the user wishes to cover the screen, the screen is blackened and the idle image is displayed drifting across the screen.

idle image

A user settable picture that is displayed when the system is in idle, usually a white picture on a black background.

if – then

A decision making procedure based on boolean, true or false test(s) of the form equal (=), greater than(>), greater than or equal to (>=), less than (<), less than or equal to (<=) or is not equal to (~=).

image

A type of Forms element which defines an area into which a bitmap image can be pasted.

in box

The default receiving folder for an Information Center. An Information Center's in box contains items that have not been placed in a particular folder but have been assigned to the center.

inactive

Document System: When a looks formatting property (either character or paragraph) is inactive, its value will not be applied to the current selection.

Interpress

A printer file format developed by Xerox which is used primarily by Xerox machines. A trademark of Xerox Corporation.

interpreter

The virtual machine portion of a Smalltalk – 80™ platform. The interpreter reads a Smalltalk virtual image file and interprets (executes) the code in it. It operates as an application or tool in the operating system environment.

interval

Chart Editor: The number of units between display of y – axis labels.

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invert Sketch Editor: To change the bits in an image such that all black bits become white and all white bits become black.

item The basic unit of information stored in an Information Center. An item may be a folder, a data item, or a key word.

kermit A file exchange protocol implemented on a wide variety of computer systems allowing the transfer of files from system to system.

key word A words or phrase that is significant to a data item or folder. Data items can be automatically filed into folders by matching keywords. Items can also be retrieved by keyword search.
Document System: A substantive word or phrase which can be applied to a document, and which provides access to the document when used as a search term.

keyword link A link type provided by the system which is used only for connecting Information Center items to their key words.

label Forms: A type of form element containing a text string which may be used to title or provide comment about the form or other elements within it. An area in a form defined as a label is totally passive in that it cannot be modified in user mode.
Spreadsheet: One of the three options for the type of contents of a cell. Description of the cell or Spreadsheet.

label by percent Chart Editor: A selectable option available in the "change set up" QBox obtained when changing chart parameters. When selected, a pie chart segment will be labeled as a percent of the whole volume.

landscape An orientation in which the longer dimension is horizontal. For example, the landscape orientation of an 8 1/2" by 11" piece of paper is with the 11" sides horizontal.

latitude Map Editor: Angular distance on the earth's surface expressed in terms of 0 to 90 degrees north or south of the equator.

lat/lon An x – y coordinate system used to describe the location of a point on a map in terms of degrees latitude and longitude.

lat/lon grid Horizontal and vertical lines drawn on a map with a spacing of a specified number of degrees latitude and longitude.

lead A vertical distance or space between lines or paragraphs in a document.

left mouse button The mouse button used for pointing and selecting. It is used to position the text insertion caret and to select data and menu items.

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left shift key The shift key on the left hand side of the keyboard. On some machines, however, this key is actually a different key elsewhere on the keyboard. See the release notes.

legend A display in the upper right hand corner of a chart, used to convey information about the chart. Generally it maps the chart labels to the fill pattern used in the chart.

LIFO A settable property for the clipboard, it means that the clipboard is treated as a last in first out stack, i.e. the last item copied into the clipboard will be the first item taken out during a paste operation.

line height The kind of spacing from one baseline to the next baseline. Fixed line height utilizes only the specified amount of leading, but floating line height increases the leading if necessary to compensate for type fonts that may be too large to allow use of the fixed height.

line leading Line spacing (baseline to baseline) between lines of type in running text (also called line space). It is expressed in point values.

link Something that specifies a relationship between items in an Information Center. A connection between items.

link type Each link in an Information Center has a corresponding link type indicating the nature of the relationship between the linked items. There are three system defined link types (*contains*, *keyword*, *database*) and users may define over 250 more in each Information Center.

local style Document System: A set of Character or Paragraph Looks known only to the particular document.

lock To restrict access to a data item so that only the center's owner can view it.

log in Enter the Analyst system for a session by providing your user ID and password.

log out Quit an Analyst session.

longitude Map Editor: Distance east or west on the earth's surface as measured from the Greenwich, England prime meridian. Generally expressed in terms of either 0 to 360 degrees east, or 0 to 180 degrees east or west.

looks Document System: A set of formatting properties is called a look. Paragraph looks refers to the paragraph formatting properties. Character looks refers to the character formatting properties.

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<MailServerName>

<MailServerName> is a *<FileServerName>* defined in the *network information file* as the location to automatically be used for sending and retrieving files among users via **send selection** and **fetch new files**.

map database

A database containing the minimum set of fields required by the various MapEditor database utilization functions. These fields are: *Label*, *Icon*, *lat*, *lon*, *key*, and for animation, *Date*, and *Time*.

margins

White space on each side of the printed text.

matrix

A group of cells from a spreadsheet treated as a two dimensional array upon which matrix mathematics can be performed like sum, max, min, invert, determinant, multiply.

maximum value

Chart Editor: The largest value on the y axis.

menu

Enables commands to be executed by pressing and releasing a mouse button. The actual menu displayed is determined by the location of the cursor and by which mouse button is pressed.

middle mouse button

If pressed while the cursor is inside a window, a menu specific to the window pane is displayed. If pressed while the cursor is outside of all windows, a menu with general system level functions is displayed.

minimum value

Chart Editor: The smallest value on the y axis.

minute

Map Editor: A unit of angular measurement which is one 60th of a degree.

mode

Method of operations or set of conditions under which operations are performed.

mouse

A pointing device with one to three buttons that is used for pointing, selecting, and drawing.

MultiFinder

A multitasking operating system application which creates and maintains the Macintosh computer desktop. The name is a trademark of Apple Computer, Inc.

notifier

A special window which provides warning messages and signals the user that he has made a mistake. It does not require any user input.

number

A combination of the numerals 0 through 9, up to one decimal point, and a negative sign (hyphen) in front if desired. Some examples of numbers are:
13; 145.8769; 89.0; 0.445; −0.76; −54

numbered

Outlines: In producing text or printing, a choice of numbered in the QBox causes a sequential number to be added to the title for each outline entry.

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offset Document System: The number of points above or below the baseline where the bottom of the character should appear.

OrderedCollection An array of items returned to a Spreadsheet from a query of an Analyst Database. The term displayed in the cell which indicates that the contents has come from a Database query.

orientation The type of page to be printed, either landscape or portrait.

over Sketch Editor: A mode button setting which causes the brush to be applied opaquely.

owner The Analyst user who created the Information Center. Only a center's owner can access the center without entering the password, can destroy it, or can lock or unlock data items.

Package An Analyst data type which contains one or more other files. It is useful for moving lots of files around at one time and/or keeping a related bunch of files together.

page A section of text terminated by an end of page mark sent from the host computer.

page break The place where the text on a page ends.

page layout style Document System: A named set of properties defining the layout of the text, headers, footers, classifications and page numbers on a page.

pane A rectangular sub-area of a window that is used for displaying or manipulating information that is associated with the window.

paragraph A line or group of lines set off with extra space before and after from other sets of lines. A document is composed of paragraphs.

paragraph leading Distance from the baseline of the last line in a paragraph to the top of the first line in the next paragraph.

paragraph mark A formatting symbol which denotes the end of a paragraph.

paragraph style A named set of paragraph looks.

parameter A factor used to determine the characteristics, configuration, or appearance of a chart.

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password

An access word known only to you and the system used to validate you as a user and to protect your data from others.
A word required for access to a center. If the password is non-empty, every user except a center's owner must enter the password before viewing or modifying the contents of an Information Center.

paste

Inserts, at the current selection, whatever information is currently in the clipboard. Certain data items can be pasted inside other data items.

pica

Twelve points, defined as 0.166 inch (not a continuing fraction!).

pictures

Any graphic element of a document is referred to as a picture.
Sketch Editor: A picture element. The smallest unit of resolution in an image. One bit.

pixel

Smallest addressable point of a bit-mapped screen that can independently be assigned intensity.

point

Defined as 0.01383 inch, about 1/72 of an inch.

point size

The distance from the longest descender to the highest ascender of a font. The maximum height found in a character set.

popup menu

The simplest type of menu that does not have sub-menus or scrollable lists. "Pops up" at the location of the cursor when a mouse button is pressed.

portrait

An orientation in which the longer dimension is vertical. For example, the portrait orientation of an 8 1/2" by 11" piece of paper is with the 11" sides vertical.

PostScript

A printer file format developed by Adobe Systems, Inc. The name is a registered trademark of Adobe.

press and release

Press a mouse button and hold it down for a period of time before releasing it.

preview

An obsolete Analyst data type.

printing status

A window which gives information to the user about the progress of the background printer. It indicates which document is being processed and how close to completion of printing process the document is.

profile

Document System: A set of document characteristics such as paper size for printing, the starting page number, and the starting endnote and footnote numbers for the document.

prompter

Requests a single line of text input from the user.

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QBox A tool for answering several related questions in a single window. It requests the user to provide multiple, related pieces of information to the system in order to carry out desired instructions. Also called a question box.

querier A user input device that looks like a prompter but instead of the user typing into it, inputs must be selected from middle mouse button popup menus. The choices on the menus are defined in such a way that the user is forced to make syntactically correct inputs.

query n. a logical expression used to filter records according to the data in their fields.
v. to run a query on (filter) a set of records.

ragged Lines of text that are not in alignment.

record A database entry. The basic unit of information in a database. A record consists of one or more data fields.

recover To retrieve data items from the disk that are not attached to an Information Center. These recoverable items have either been dumped from all centers, or were created without being saved in a center. This is sometimes referred to as scavenging.

referencing cells Referencing cells in other sheets permits a hierarchy of spreadsheets. For instance, you might have a set of regional spreadsheets all linked to a national spreadsheet, and the national spreadsheet linked to a continent – wide spreadsheet, and so on.

refile To move a data item from the Scavenge Center or a trash folder into one or more Information Centers.

refresh To redisplay a screen image display.

relative See cell reference

release To drop an item from a folder. Used to eliminate items from the list in the Scavenge Center.

restore To bring the backup copy of the text into memory in order to recover the original copy.

reverse Sketch Editor: A mode button setting in which the black bits in the brush invert (reverse) the sense of the bits in the image where it is applied.

reverse video Mode of displaying characters on screen opposite of normal display mode. For example light characters against dark background, as opposed to dark characters against light background.

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right mouse button If pressed while the cursor is inside a window, a menu for window manipulation is displayed. If pressed while the cursor is outside of all windows, a menu that controls the overall screen is displayed.

rotate Sketch Editor: A brush button menu option which allows clockwise rotation by 90, 180, or 270 degrees.

row Horizontal array of cells in a spreadsheet.

row indices Sequence of numbers which are in the first unnumbered column to the right of the heavy border on the left side of the spreadsheet; designates the row reference number.

rowNumber A term used in writing Spreadsheet rules to return the row number of the cell the rule is in.

rule Spreadsheet: One of the three options for the type of contents of a cell. One or more Analyst functions entered by the user into the comand bar. Upon acceptance, the function is evaluated and returns a value to the cell to display as its contents. Especially useful to make the contents of one cell depend upon the contents of another.

run - around Document System: Text flowing around (to one side or the other) an object. A paragraph look, which when applied to a paragraph with only one character in it, will cause that paragraph to allow the text of other paragraphs to flow beside it.

sans - serif A character face which does not have serifs. A font set which has sans - serif characters.

save Cause the current memory resident state of your data item to be written out to disk for long term storage.

scaling Chart Editor: Calculation of the maximum and minimum values and the interval on the y - axis. On the x - axis, scaling determines the distance between data points and a gutter width for bar charts.

scavenge The Scavenge Center is accessible from the Information Centers panel. It is used to find existing data items which are not currently in an Information Center so they can be either destroyed or refiled into an Information Center.

scratch pad A scrollable simple text window for typing notes, memos, or any other text. Contents can be saved so that the next time it is opened, it will display whatever was saved.

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screen menu A system menu that controls the overall screen display. Appears when the cursor is outside of all windows and the middle or right mouse button is pressed. The middle button menu contains Analyst system level commands. The right button menu contains commands for controlling the overall screen display.

scroll To move an image or block of text up, down, or sideways on screen, revealing new parts of image or text at top, bottom, or opposite side of screen.

scroll bar A tall narrow rectangular area that appears on the left side of a pane when the cursor is inside that pane. Used to specify which part of the available information, usually text, you wish displayed in the pane.

scroll button The set of four crossed arrows in the upper left corner of a Spreadsheet.

scroll map A small window displayed outside the Spreadsheet's heavy lines and to the upper left, after the scroll button is clicked. The representation is 1/15 scale of the entire Spreadsheet. Gray areas indicate data on the sheet. Used to scroll from one section of the sheet to another.

scroll menu Displays part of a long list of options, and provides scrolling as the means for locating the desired option in the list.

scrolling Forms: Moving the area of the form which is visable within the form window.

second Map Editor: A unit of angular measurement which is one 60th of a minute.

select To choose a menu item or a piece of text by pointing to it or drawing through it with the mouse while pressing a mouse button.

selection The area in the text, highlighted in reverse video, where the next editing function is to be applied.

serif A character face which has a short light line or stroke projecting horizontally from ends of main vertical strokes of roman letters. A font set which has serif characters.

single data Chart Editor: Data which has one value for each entry. For each label on the x – axis, there is one value on the y – axis.

sort To put the data items in a folder into alphabetical order, first by data item type and then by label.

spacing The distance in pixels between grid lines.

spawn To generate a copy of text displayed in the text editing pane.

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special item Document System: One of many types of objects which are not text but which may be pasted into a document. A special item has a position on the text, moving and flowing with the other characters as if it were just another character. A special item can usually be selected to obtain a middle button menu with options special to it. Examples are pictures, forms, data item references, footnote and endnote reference markers.

spline A line or curve passing through a series of points. an activity button menu option which causes the brush to be moved through a series of points defined by the user.

stack label Chart Editor: A label for one set of values in stacked data.

stacked data Chart Editor: Data which has more than one value for each entry. For each label on the x—axis, there is one or more y values, each of which corresponds to a stack label. stacked data is usually data which has been subdivided. An example is the automobile production of a company for a number of years, broken down by make and model, where the years are the labels and the make and model would be the stack labels.

state Set of conditions under which operations are performed.

Stats Spreadsheet: The object returned to a cell by a rule using the function **Stats on: {cell}**, where {cell} contains an OrderedCollection of numbers. The object is in turn accessible by statistical functions.

sticky point The small grey boxes located at the middle of each edge and at the center of a picture which are used for reshaping the frame which surrounds the picture. The middle sticky point is used to grab the picture and move it about on the page.

string Any sequence of characters.

structure Principle features or main parts of an outline. The list of outline entries.

structure pane Outline window pane which displays the structure of the outline.

structure text The outline entry hierarchy without any textual content.

structure tree browser A window which will graphically display the links and connections between items in an Information Center.

style sheet A document containing a collection of division styles, paragraph styles, and character styles which are saved for usage in another document.

subentry An entry indented inward from the entry above it.

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subscript Small symbol, numeral, or letter that prints below the baseline; for example, h2o.

superscript Small symbol, numeral, or letter that prints above the baseline; for example, (cm)2.

surround Sketch Editor: To enclose on all sides. A Brush button menu option for defining a new brush by drawing a line surrounding the bits to be used.

switch A type of form element which can be used as an 'on/off' button or notifier. The on state is indicated by displaying the box and its contents in reverse video.

symbol Sketch Editor: A shape used for identification.
A brush button menu option providing access to a list of symbols.

tab interval A fixed interval of empty character spaces, which is used as the default tab spacing.

tab rule A displayed ruler along which you can indicate the desired location of the tab stops.

tab stop A specified horizontal location of text alignment in lines of running text.

tab type Specifier of the pattern of text alignment at a tab. There are four tab types: left, center, right, decimal.

Tack A host based interactive computer graphics software system designed to support varied geographic data applications.

Tajo The runtime environment of XDE. The usual environment for running Smalltalk on Xerox 6085/1186 and 8010/1108/1109 workstations.

Tektronix 4014 A graphical display terminal manufactured by Tektronix Inc. which can be connected to a mainframe host.

template An attribute which can be assigned to a data item so that opening it actually causes a duplicate to be made and opened. A data item which has this attribute. A template data item is itself protected from modification while serving as the basis for the creation of new items.

text editing pane Outline window pane which displays the text of an entry or subentry selected in the structure pane.

text item window A scrollable window pane directly below the title tab where you may type and edit text, using the keyboard and mouse driven menus.

text pane Sketch Editor: The window pane directly below the title tab where you may type and edit text.

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time

An hour, minute, second, and am or pm. It may be entered in 24 hour format, but will always be displayed as hh:mm:ss am or hh:mm:ss pm. If no time is entered in a time field, the database will display it as unknown time. The form for entering a time is:

<hour>:<minute>:<second> <am/pm>

where: <minute>, <second> or <am/pm> may be omitted.

e.g. 1:59:30 pm; 8am; 15:30

title tab

Attached to the top left corner of a window, it displays a name identifying the information displayed in the window.

top level folder

The folder which is at the root of the hierarchical structure of an Information Center. The top level folder is the folder which is opened when an Information Center is opened by clicking in the Information Center access window.

transaction pane

The topmost pane in a window on a folder, found below the title tab and any classification bar. The transaction pane displays the label of any data item contained on the clipboard. It may also contain the status of any action currently going on in the center.

transparent pictures

Pictures that do not obscure underlaying text.

trash

The safety net folder attached to an Information Center that contains data items that have been cut from a center. Data items can be dumped or destroyed from the trash folder. They can also be copied and pasted, or refiled if they were cut accidently.

tree menu

Consists of a top level menu and one or more sub–menus. Commonly used when there is a long list of available functions that can be broken down into logical categories.

type

Forms: The type of an element determines the way it is displayed and its behavior. Element types are: label, border, fill in, switch, choice, execute, code, and image.

unary operation

Spreadsheet: A mathematical function operating on a single number.

under

Sketch Editor: A mode button setting which causes only the black bits in the brush to be applied. This gives the effect of merging the brush with the existing image.

Outline: A term describing a relative position in an outline structure. A subentry of an entry appearing immediately below and indented one level.

undo

Reverses the effects of the last command. For instance, if text has been deleted, undo will put it back in.

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Unix An operating system available on many different computers, including those of Sun Microsystems, Inc. Unix is a registered trademark of AT&T Information Systems.

unlock To remove the lock placed on a data item so that other users can access it.

update The process of revising the cell values based on all of the inputs to the spreadsheet since the last revision.

update mode User selectable toggle button which tells the system when you want everything to update. If the system is currently on no updates, it will not cause any update to occur until the system is set back to auto update, then it will update everything at that point.

user mode The forms mode in which the form may be filled in interactively. The Form Editor is inactive.

user profile A set of parameters for specifying user interface preferences and network access information. These parameters are stored in a user configuration file so that every time you log into the system, it will appear the way you left it. Preferences include screen color, system font, clipboard properties, and menu display options. Network access information includes printer name, file server name, and network login information.

value The information that a cell holds: numbers, strings, booleans, points, charts, databases.

vector A line from one point to another.

widow/orphan lines Undesirable splitting of a paragraph results in its last line being the top line of a page (widow) or its first line being the bottom line of a page (orphan).

window A rectangular framed area on the screen for viewing, inserting, and editing textual or graphical information.

wysiwyg The *what – you – see – is – what – you – get* mode of text display.

xcell **See columnNumber**

XDE Xerox Development Environment. A software environment that provides development tools for programmers to use in writing more tools and applications in the Mesa language. It is only implemented on Xerox machines.

XNS Xerox Network Systems. A system of layered protocols developed and used by Xerox for communication between computers over one or more Ethernet cable(s).

ycell **See rowNumber**

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