Waltz Quick Start
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1 Introduction

The Waltz Quick Start document describes by diagrams the important functions of the Waltz Visualization System [Rob95]. Waltz is a tool to visualize three dimensional data and reads special reference files containing details of the data file, path name, dimensions and aspect ratios of the data. Waltz (as the name suggests) contains three parts: *Generalization*, *Specialization* and *Abstraction*. For a more detailed explanation of the facilities and functions of the Waltz visualization system refer to the Waltz User Manual [Rob96].

- The Generalization Process splits the data into spatially connected groups.
- A specialization is formed from a subset (selection) of these groups.
- The results are displayed in multiple abstract views of the same data. These abstractions are formed by losing or augmenting the data to facilitate in the understanding of the data.

Waltz implicitly connects the abstractions together as Linkages. By default most of the Linkages between the different abstractions are switched on; they are turned off by using the Linkages Form.

1.1 Starting a Waltz Session

A Waltz session is started by typing the command:

```
% waltz
```

1.2 Finishing a Waltz Session

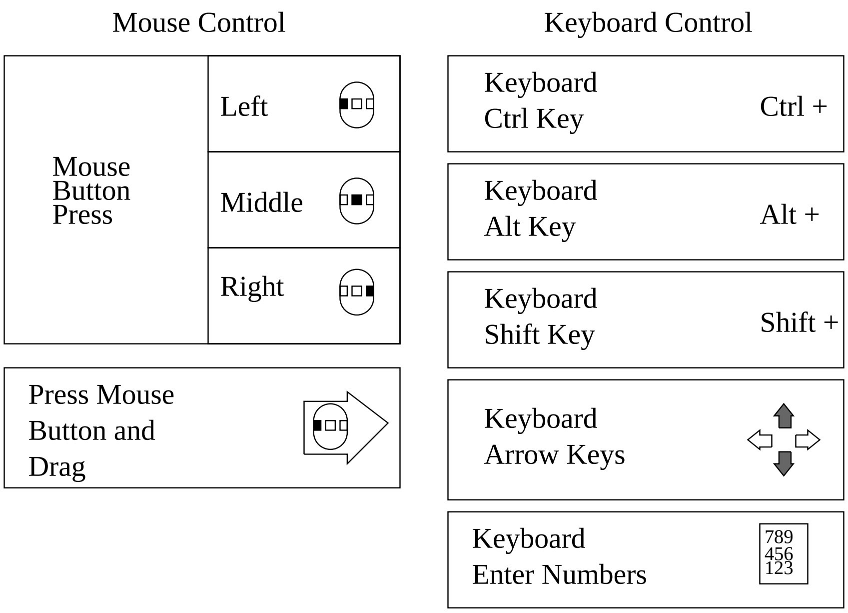
The session is ended by selecting the **Quit** option from the **File** menu at the top of the Waltz canvas; or by typing **Alt q** (the hot key configuration of the menu command).

1.3 User Hints

The *Specialization* process encourages a tree hierarchy. Waltz provides the layout and 'data exporting' to support this process. There are two main methods of using Waltz either (1) the data is grouped into a few groups, some of these are selected and exported to the following level and the data is further generalized and specialized; or (2) the data is grouped into many groups and small subsets of this generalization are specialized into multiple Grouped Abstraction Child modules.

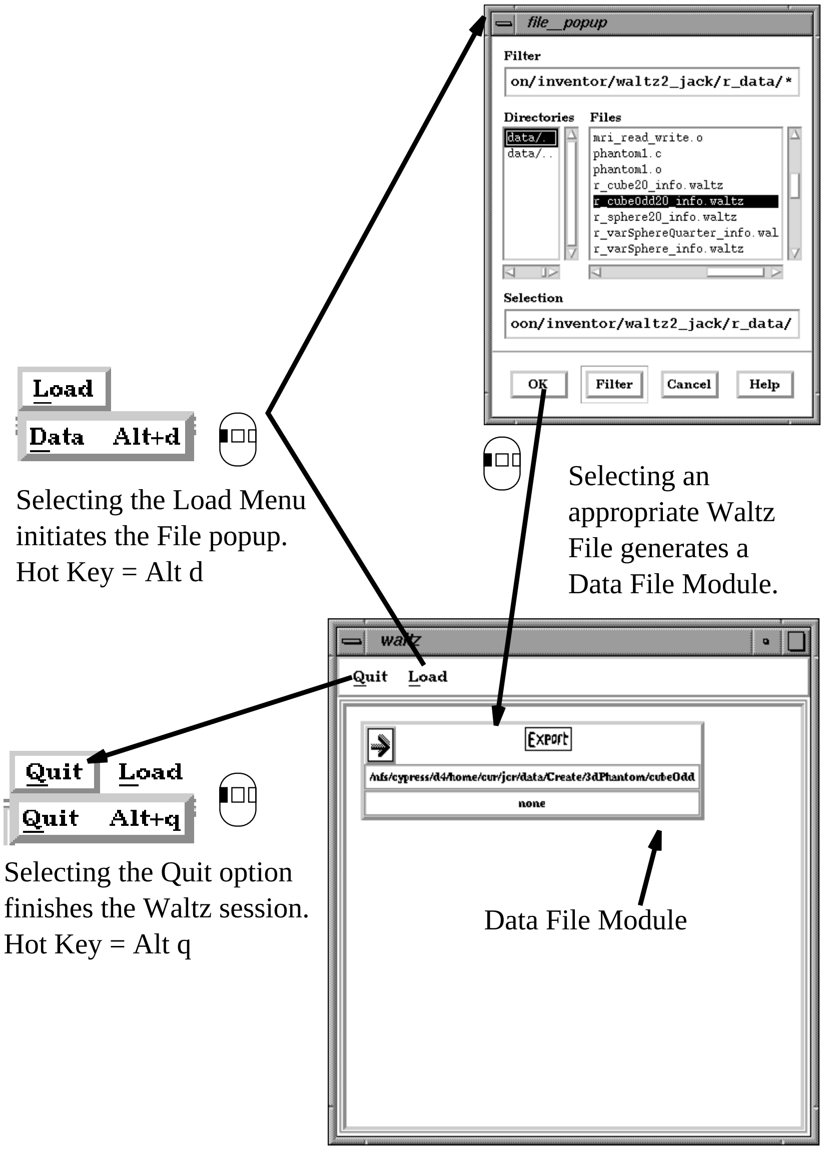
1.4 This Document

This document uses screen shots of the Waltz Visualization System with labels and icons to describe the pull-down and actions of the system. The icons are described below:



2 Loading the Data

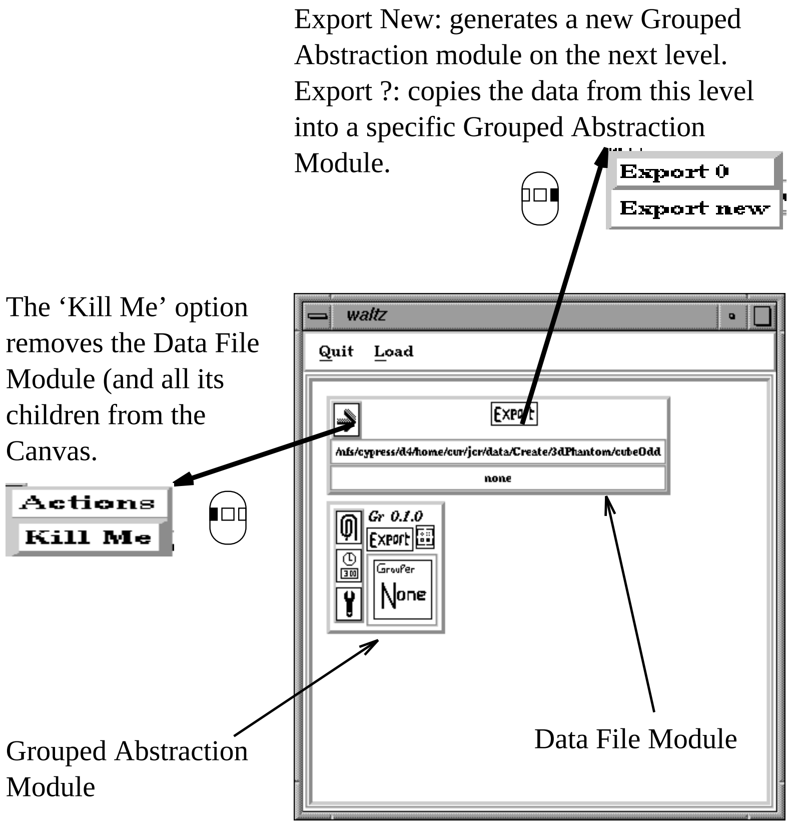
Three dimensional Data files can be loaded into Waltz using the **Data** menu pulled-down from the **Load** menu option on the top of the Waltz canvas. The Waltz system reads specific Waltz data files with a specific string **Waltz.1.0** at the top of the file. Loading a data file creates a Data File module (shown in light-pink on the Waltz canvas) at the top of the canvas.



3 Controlling the Data File Module

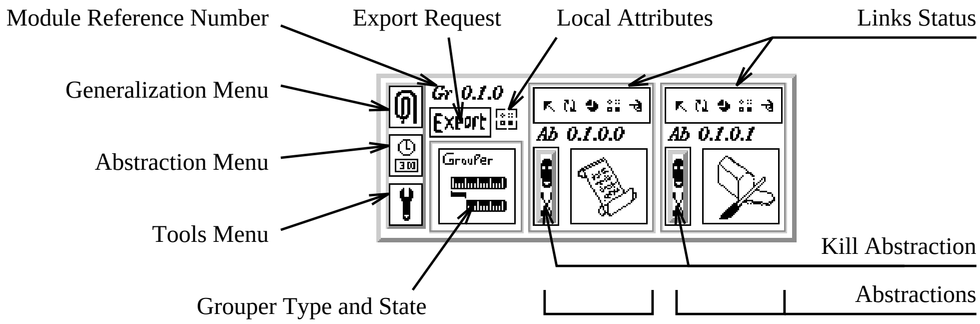
When the data has been successfully read in a Data File Module is created. This resides at the top level on the Waltz canvas (the Canvas may need to be resized). This module displays the name of the data file and provides functions to generate multiple data paths or ‘kill’ all the paths corresponding to this Data File Module.

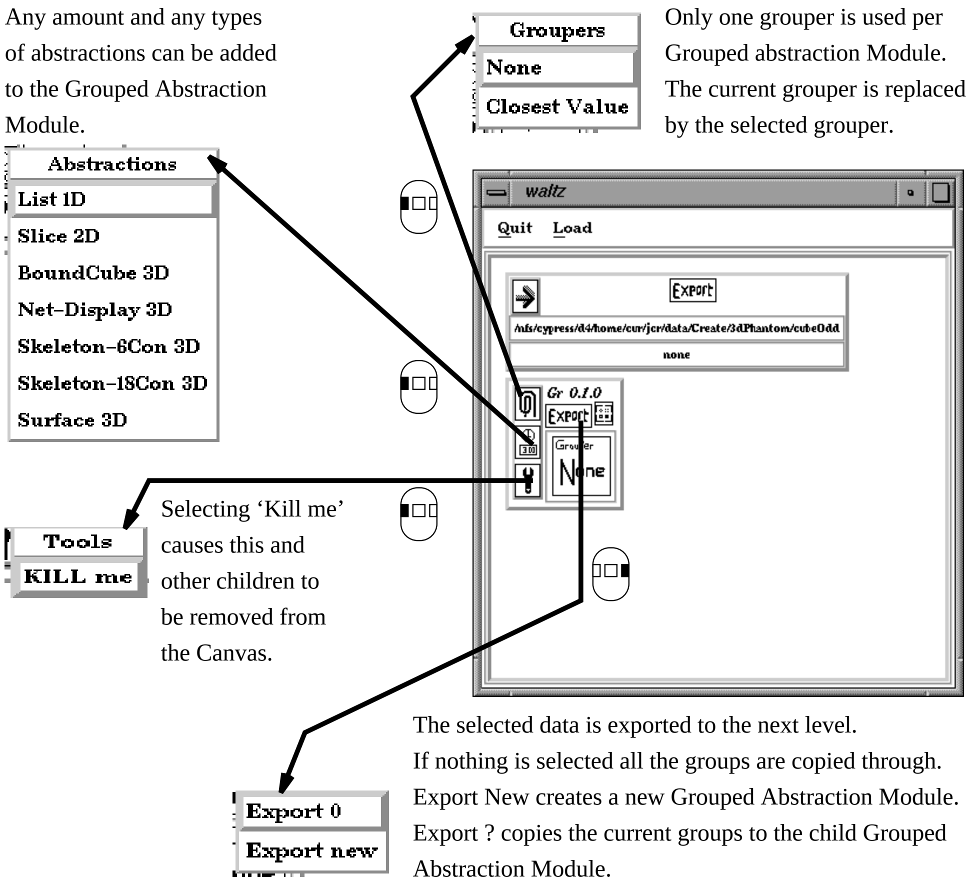
To control, generalize and view the data a Grouped Abstraction Module is needed. The module is generated by exporting the data from the Data File Module. The right mouse button on the Export bitmap creates a popup window. Export new generates the Grouped Abstraction Module.



4 The Grouped Abstraction Module

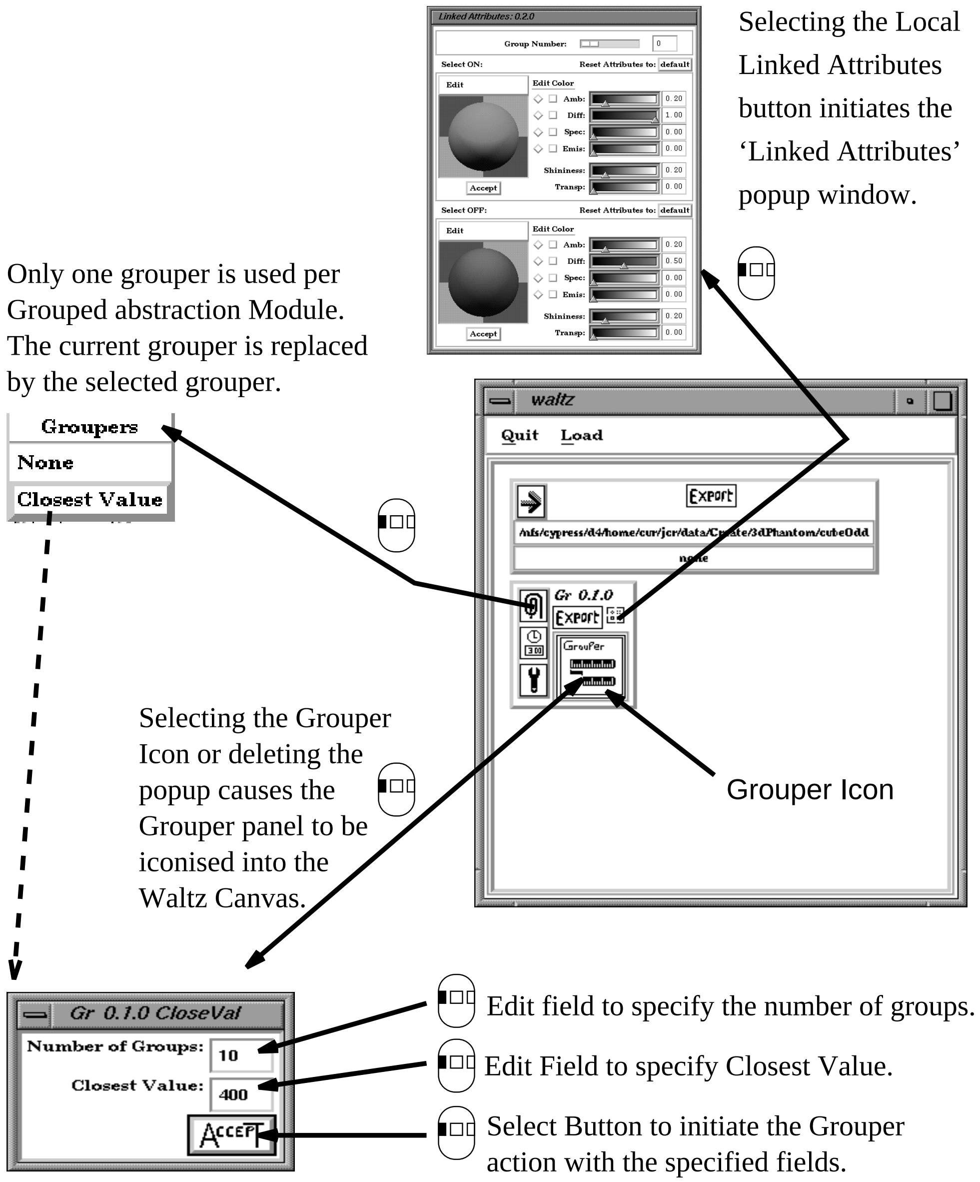
The Grouped Abstraction Module provides most of the controls to generate groupings and abstractions on the data. The user is encouraged to use the Grouped Abstraction Modules as visualization history modules, holding the past visualization experiments.





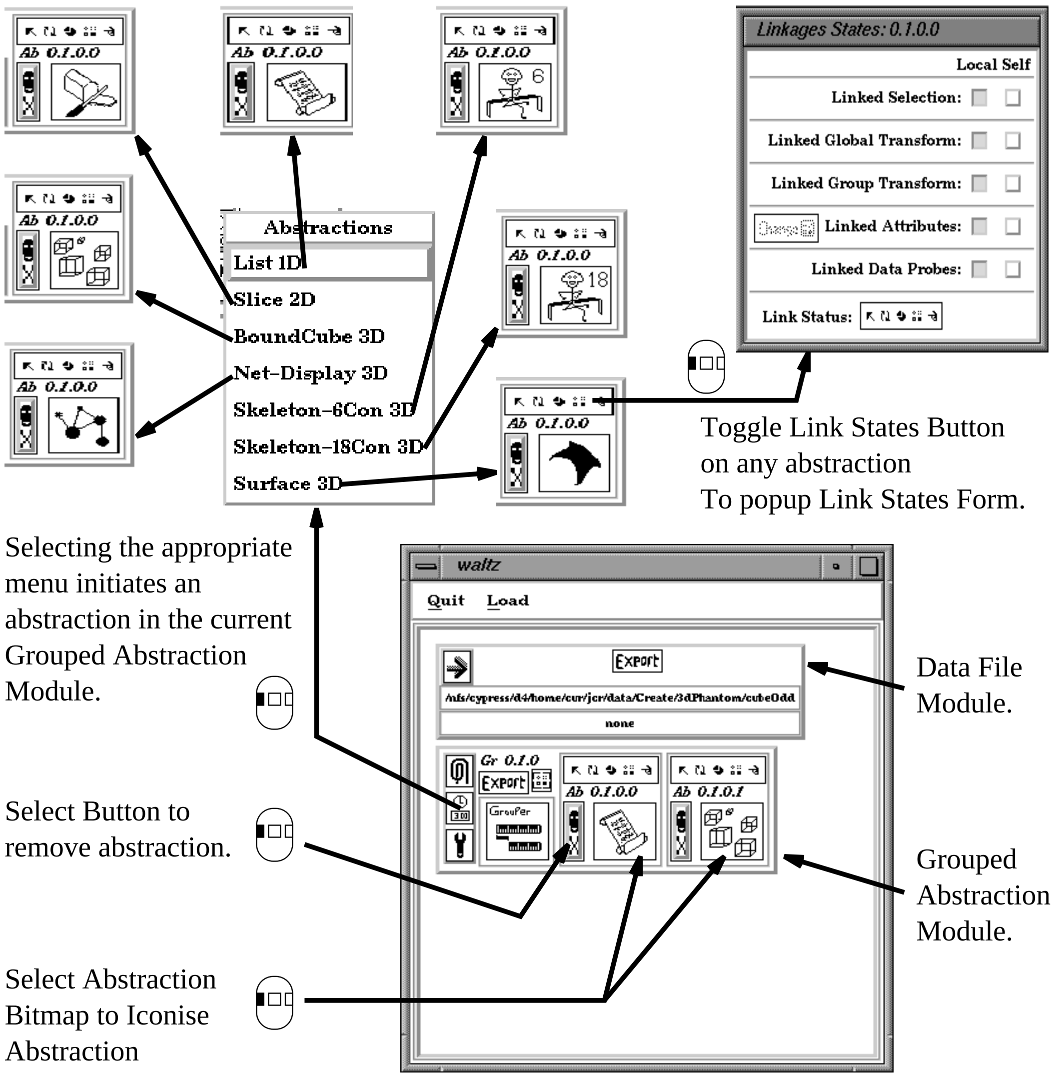
5 Controlling the Grouper Action

The Grouper popup is initiated by selecting the "Closest Value" option from the Grouper Menu. The Closest Value Grouper generalizes the data into groups.



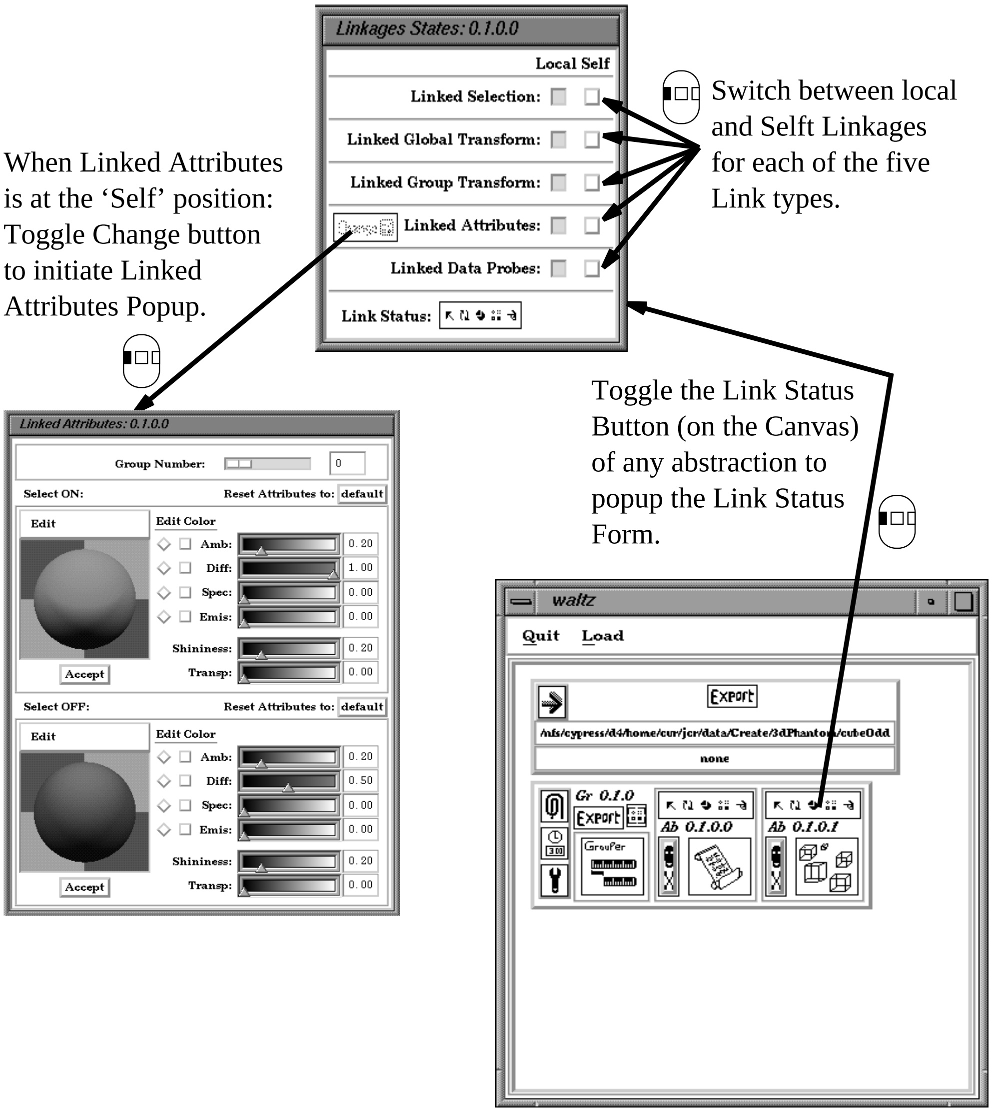
6 Initiating an Abstraction

Abstractions are added to a Grouped Abstraction Module by selecting the required option from the “Abstractions” menu. Each Link mechanism between abstractions (if appropriate) are by default linked together and are unlinked using the “Link States Form” and cursor selections.



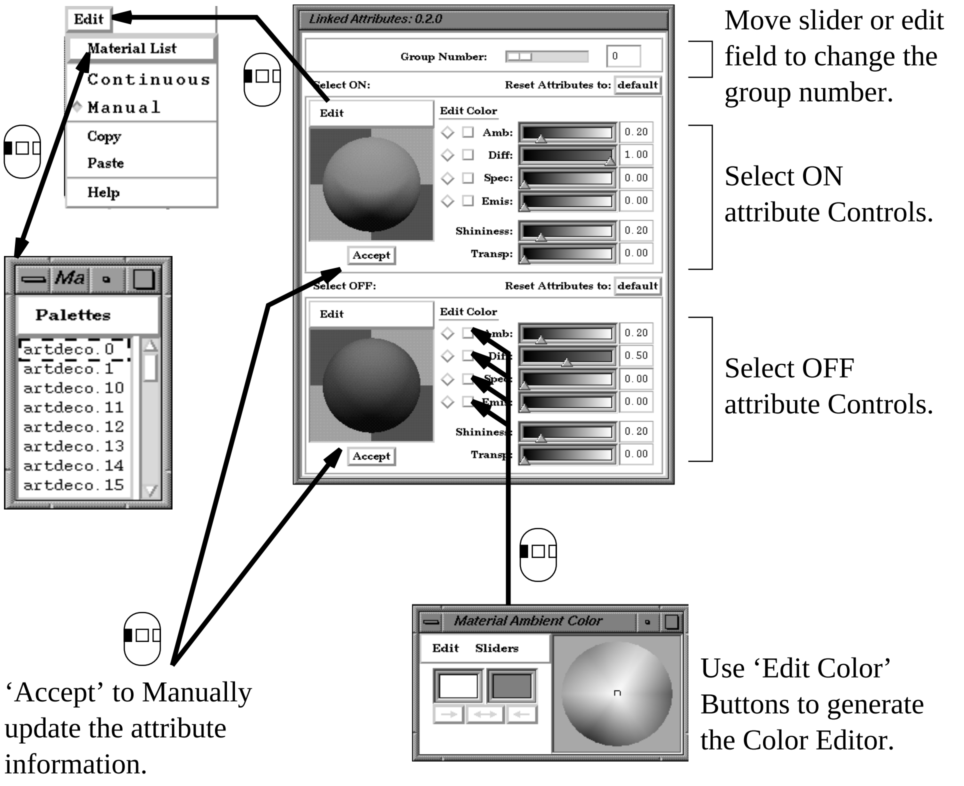
7 Editing the Link Form and Linked Attributes

The 'Self' linked attributes can be changed by selecting the Linked Attributes button (above the Grouper Icon, see Section 5). The Self Linked attributes are altered from the Link form, as shown below:



8 Editing the Attribute Values

The Linked Attribute popup contains many popups to edit the material type. The material type can be *relayed* back to the abstraction material 'Continuously' (after any change) or 'Manually' (by pressing the Accept button). The Group Number Slider (or field value) being changed to edit the required material.

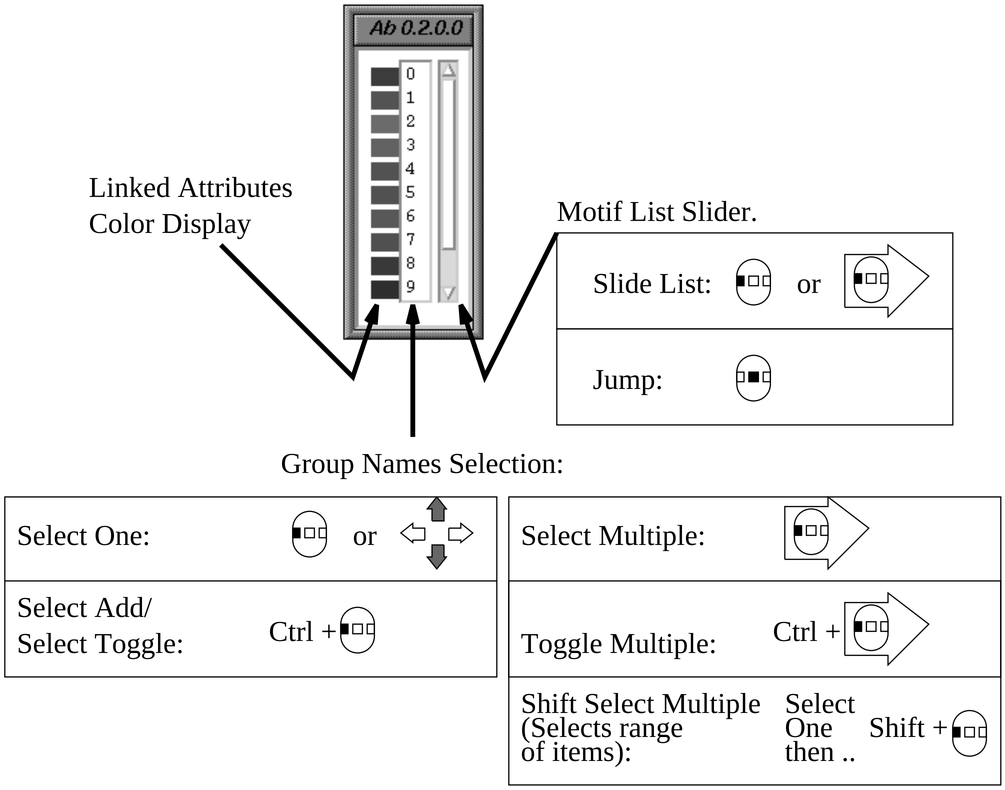


9 Controlling the Abstractions

This version of waltz supports seven abstractions. Each abstraction is inherently linked to any other abstraction. However, some of the linkage types of higher dimensionality make no sense in the lower dimension abstractions and therefore, are not linked. For example the two dimensional slice abstraction ignores the linkage information of Global and Group Transformation. Therefore the abstractions are grouped and explained by dimensionality.

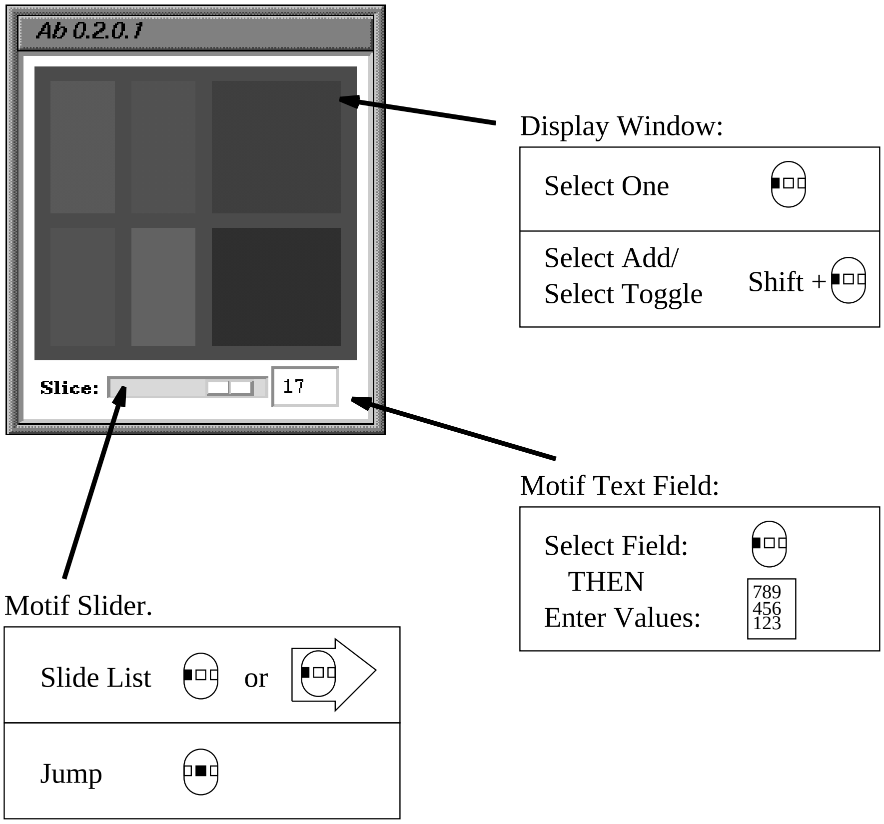
9.1 Abstraction with One Dimension

The list abstraction displays the names and material types of the groups in a list. If there are eleven or more groups a slider is provided to display the unseen values of the list. Singular or multiple list elements can be selected and individual list elements can be toggled.



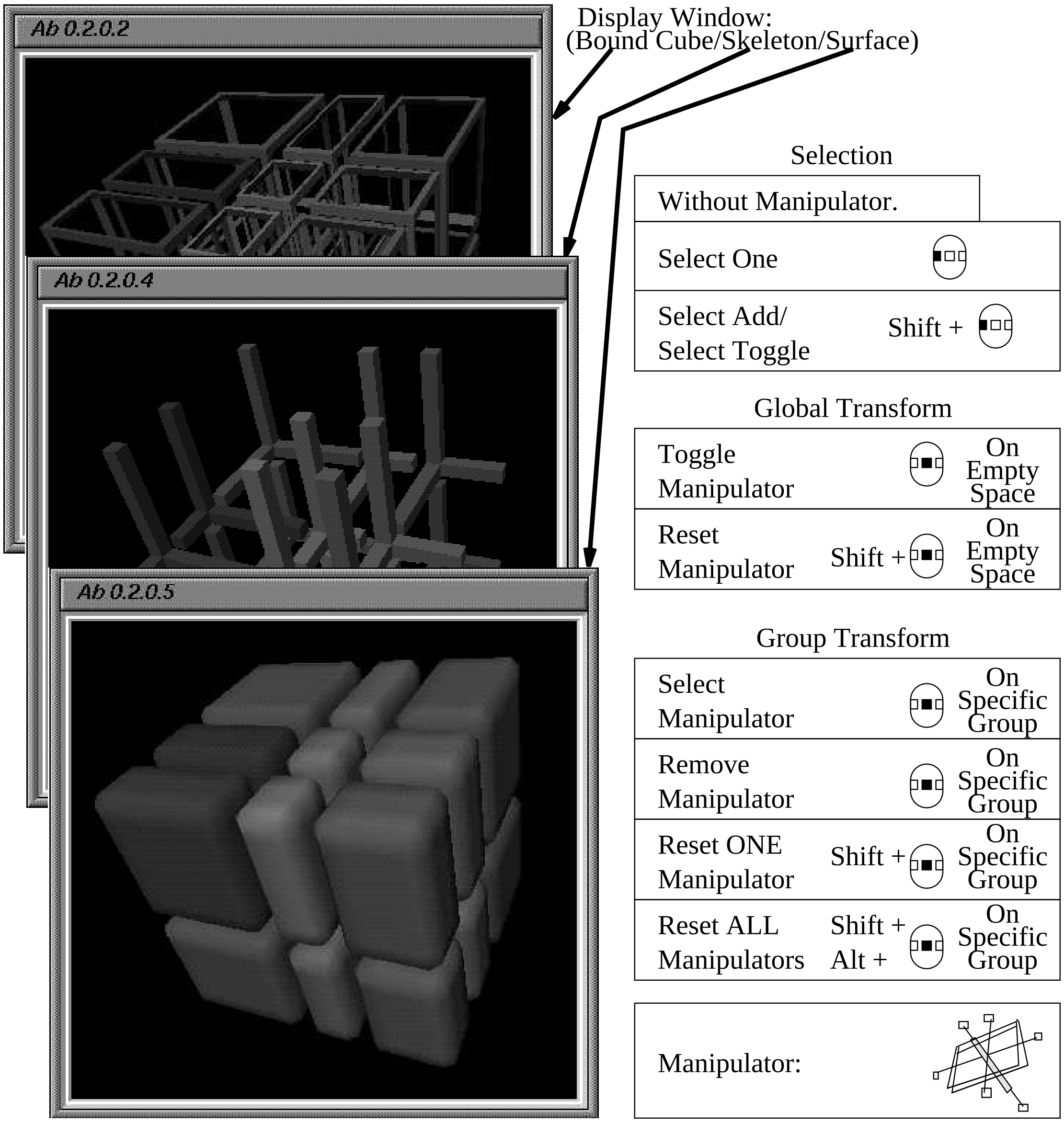
9.2 Abstraction with Two Dimensions

The Slice Abstraction displays slices though the data, along the Z axis. The sliders when there are multiple slice abstractions within one Grouped Abstraction are connected as Linked Probes.



9.3 Abstractions with Three Dimensions

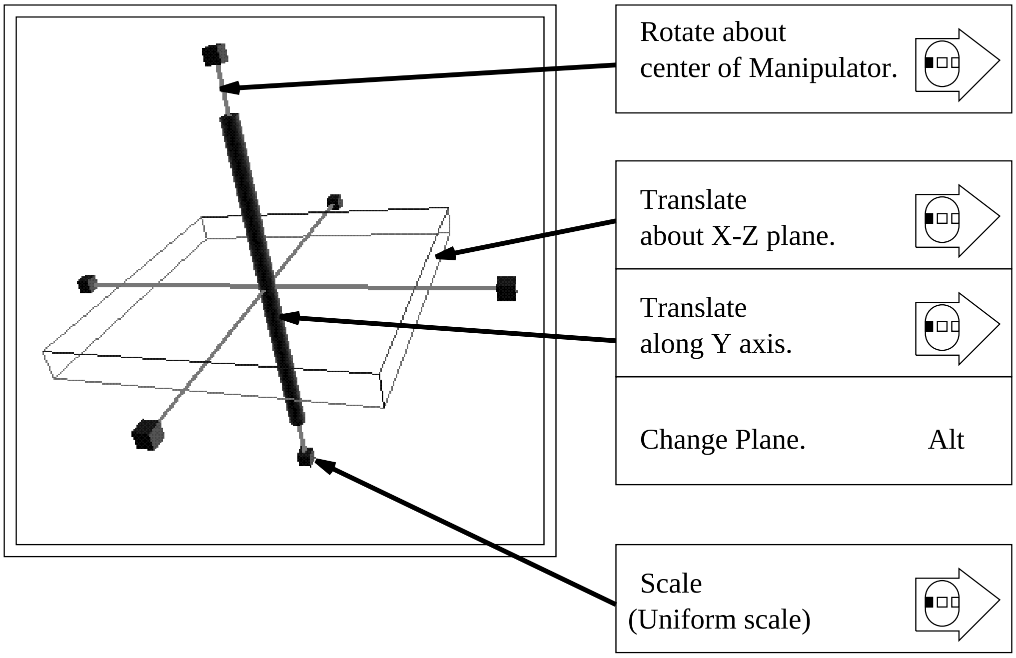
The Bounding Cube, Net-Display, Skeleton and Surface abstractions are controlled similarly. A Jack-manipulator is added to the display (using the middle mouse button) when the Global or Group Transform Linkages are required.



9.4 Controlling the Jack-Manipulator

The Jack-Manipulator controls the scaling, position (translation) and orientation (rotation) or the surrounded object.

Note: Colors have been inverted!



10 A Session Walkthrough

The following section describes an example walkthrough, explaining the usual progression and order of commands within a Waltz session.

	Description	Page
1	Make sure Auto Window Placement on the window Settings has been selected.	1-1
2	Start a Waltz Session. Resize the window to about quarter the screen size.	1-1
3	Select the **Data** Menu (under **Load** menu).	2-1
4	Double click the mouse button on the required file, or select the file (using the left mouse button) and select the **OK** button.	2-1
5	**Export** the Data to generate a new Grouped Abstraction Module. Use the right mouse button to select the **Export new** menu on the **Export** button of the Data File Module.	3-1
6	Select the **Closest Value** grouper from the **Groupers** Menu (excluding group numbers '0' and '1').	4-1
7	Edit the **Number of Groups** and **Closest Value** fields to values "5" and "400" respectively. Select the **Accept** button to initiate the grouper action and wait for the grouper to finish.	5-1
8	Select the **List 1D** abstraction from the **Abstractions** menu on the Grouped Abstraction Module.	6-1
9	Select a few group elements from the List abstraction.	4-1
10	Use the right mouse button on the Grouped Abstraction Modules **Export** button to **Export new** the data to the next specialization level (that also generates a new Grouped Abstraction Module).	4-1
11	Select the **Surface 3D** option from the **Abstractions** menu (in the second Grouped Abstraction Module) to initiate the Surface Abstraction.	6-1
12	Add the Jack manipulator, by pressing the middle button on empty space (in the Surface Abstraction window).	9-1
13	Manipulate the three dimensional image using the Jack Manipulator.	9-4
14	The Linkages (including 'self' color attributes) are altered using the Linked Attributes Form.	7-1
15	The Local color attributes are changed using the Linked Attributes popup from any Grouped Abstraction Module.	5-1
16	Select the **Quit** option from the **Quit** menu to finish the Waltz session.	1-1

References

[Rob95] Jonathan C. Roberts. *Aspects of Abstraction in Scientific Visualization.* Ph.D thesis, Kent University, Computing Laboratory, Canterbury, Kent, England, UK, CT2 7NF, October 1995.

[Rob96] Jonathan C. Roberts. Waltz User Manual. Technical Report 22-96, Computing Laboratory, University of Kent, Canterbury, UK, December 1996.