CHAPTER 5 BROWSER

The Browser window (Figure 5-1) provides the means with which to view the parts of a simulation. When a simulation is exported to the Browser, the name of the simulation appears in the Browser's upper left box and the child instances of the simulation appear in the upper right box. Selecting a child instance in the right box will move the instance to the bottom of the stack in the left box and display it's children in the right box. The instance tree can be traversed in this manner until an atom (usually a variable) resides at the bottom of the stack in the left box and it's attributes appear in the right box. Selecting a member of the stack in the left box will clear any lower instances on the stack and display the selected instance's children in the right box.

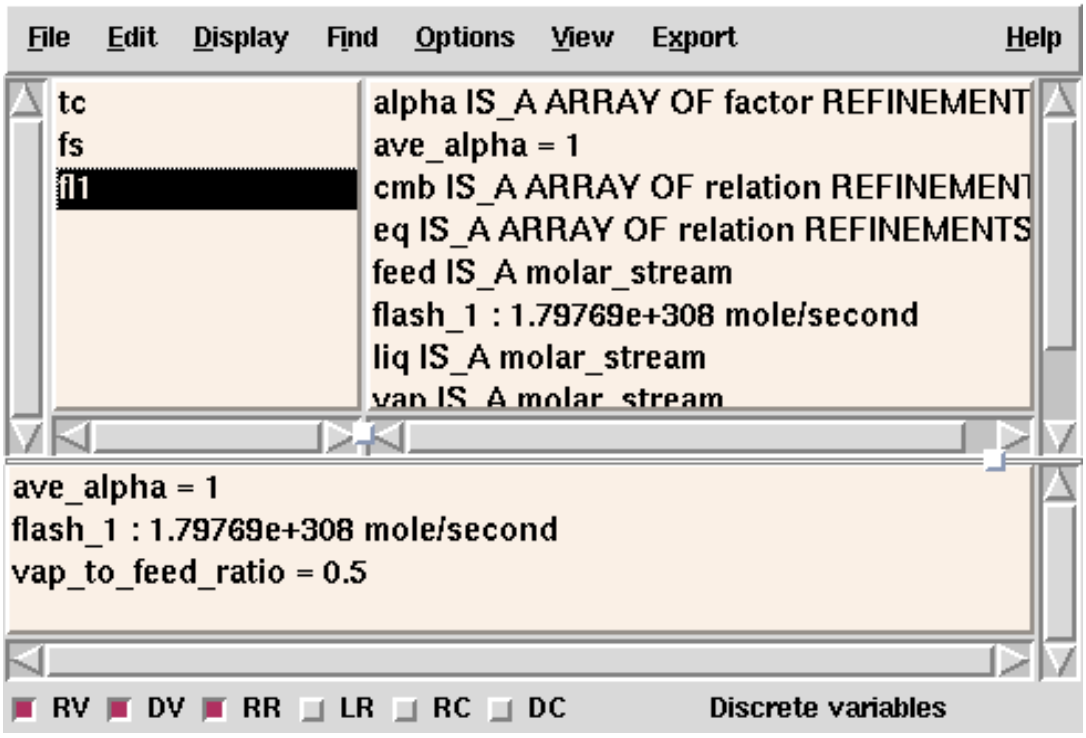

Figure 5-1 ASCEND's Browser window.

A subset of the instances appearing in the upper right box as well as the values of these instances appear in the Browser's lower box. Which subset of instances appears in the lower box is controlled by the user by clicking in some of the options given in the bar at the bottom of the Browser window. In Figure 5-1 RV has been selected. RV stands for **R**eal **V**ariables. Therefore, the child instances of fl1 which are real variables and the values of these real instances are shown in the lower box. Other options in the bar at the bottom of the Browser window, which can be simultaneously selected, are DV (Discrete Variable), RR (Real Relations), LR (Logical Relations), RC (Real Constants) and DC (Discrete Constants). Selecting an instance in the lower box with the right button of the mouse will have the same effect as selecting the same instance in the upper right box. On the other hand, selecting an instance in the lower box with the left button of the mouse will bring up the "Set Value" Dialog box, which will give the user the option of modifying the value of the selected instance. More about the "Set Value" option will be given in the following section of this document.

5.1 THE MENU BAR

- The menu bar on the Browser window has eight entries: File, Edit, Display, Find, Options, View, Export, and Help.

5.1.1 BROWSER FILE MENU

`Read values` Reads the values from a file previously saved by Write Values. Values files are read using full path names (including the simulation name). The simulation for which values are being read does not necessarily have to be in the Browser (but it should exist). You may specify that the values are to be read into a different simulation or simulation part than they were originally saved from, provided the old and new locations are compatible. If the original simulation does not exist, you will be asked for a new simulation name.

`Write values` Saves the values for the instance in the Browser to a file for later rereading.

`Close window` Closes the Browser window. To reopen, go to the Script window and select *Instance browser* under the tools menu or select the BROWSER on the Toolbox window.

`Exit ASCEND` Exit the ASCEND system entirely. You will be asked if you really wish to complete this instruction.

5.1.2 BROWSER EDIT MENU

`Run method` If the instance in the left box has one or more methods available, Edit ->Run Method will be available for selection. Selecting Run Method

will display the Methods Selection Window containing a list of available methods for the current Browser instance. A method is selected by clicking it's name (only one method can be selected at a time). Depressing the OK button will run the selected method. Depressing the Show button will display the code for the selected method. Depressing the Cancel button will close the Method Selection Window without running any method.

Clear Vars

In ASCEND, the type solver_var and all its refinements constitute a variable for solution purposes. Each variable has a boolean, named "fixed", as one of its children. When a variable's fixed boolean, or fixed flag as it is commonly called, is set to False, the variable is considered an output variable (i.e. the solver will determine its value). The Clear Vars method sets the fixed flag of every variable which is a child of the current Browser instance to False.

Set value

When the current Browser instance is a real, symbol, integer, or boolean Edit->Set Value will be available for selection. Selecting Set Value displays the Set Value Dialog box. The value (and units in the case of reals) may be set by filing in the value (and units) fields of the Set Value Dialog box and depressing the OK button. Depressing the Cancel button closes the Set Value Dialog box. Booleans are assigned simply by double clicking the mouse button 2 on their name when it appears in the right browser box.Write values

Selecting Edit->Write Values saves the attribute values of all atoms which are descendents of the current instance to a file. A file select box is displayed so a new file may be created or an old file over written. The attribute values are written to the selected file along with their path names relative to the current instance. The first line of the file specifies the path from the simulation to the current instance.

Refine

Refines the current Browser instance to a given type. Edit->Refine may only be selected if the Library contains types which are refinements of the current Browser instance type. Selecting Edit->Refine displays the eligible types for the refinement of the current part in the Refinement dialog box. Selecting a type and depressing OK refines the current type to the selected type. Depressing Show displays the ASCEND code for the selected type. Depressing the Cancel button closes the Refinement dialog box without making any refinements.

Merge

ARE_THE_SAME the current part (left side of the Browser) with another given part. Do not ARE_THE_SAME parts from 2 different simulations. You cannot merge parts of atoms (which are atomic) with anything. The dialog box will ask for the name of the instance that you

want to merge with the instance highlighted in the left box of the browser.

Compile Submenu containing Resume Compilation and Create Part.

Resume Compilation Attempts to process any pending statements in the simulation in the Browser. It does not matter where in the simulation you have browsed to, Resume always starts at the top.

Create Part This is a feature of the PASCAL version only. The proper way to add a part to a simulation is to create a refinement of the original model in a new file, read in that definition, and refine the simulation up to that new model.

5.1.3 BROWSER DISPLAY MENU

Attributes Display the attributes of a real variable. Other functionality may be added later to this button.

Relations Display all the relations at or below the current point in the Browser. Relations get arbitrary names unless explicitly named by the user in code. The arbitrary name, at the moment consists of ParentName_n where n is the number of the nth relation in the MODEL ParentName. If this name is not unique, enough letters a-z get added to make it unique. When the instance highlighted in the left box of the Browser is a real variable, this option will display all of the relation in which such a variable is incident.

Conditional Relations Display all the conditional relations in or in the children or grandchildren etc., of the current object in the Browser. Conditional Relations do not have to be satisfied. They are used as boundaries in conditional programming. The arbitrary name of a conditional relation is obtained in the same way as any other relation, but in general, the name of a conditional relation must be provided by the user, since the operator SATISFIED requires such a name.

Logical Relations Display all the logical relations in or in the children or grandchildren etc., of the current object in the Browser. Logical Relations get arbitrary names unless explicitly named by the user in code. The arbitrary name of a Logical Relation follows the same pattern as that of real relations. When the instance highlighted in the left box of the Browser is a boolean variable, this option will display all of the logical relation in which such a boolean variable is incident.

Conditional Logical Relations Display all the logical relations in or in the children or grandchildren etc., of the current object in the Browser. Conditional Logical Relations do not have to be satisfied. They are used as conditions to check in conditional programming.The arbitrary name of a conditional logical relation is obtained in the same way as any other logical relation, but in general, the name of a conditional logical relation must be provided by the user, since the operator SATISFIED requires such a name.

Whens This option is enabled for instances of models, relations, booleans, symbols, and integers. For the case of a model instance, this button will display not only all the when instances defined as parts of such a model, but also the when instances which include such a model in one of their CASEs. Distinction is made between those two possibilities. For relation, boolean, symbol and integer instances, this option displays the when instances which include such relation, symbol, etc., either in one of their CASEs or in the list of conditional variables. When instances are useful for the conditional configuration of a problem and always get arbitrary names.

Plot Invokes a plotting program, if allowable, on the current object. The type of plot generated is controlled by the Utilities page variables Plot.type and Plot.program. See the relevant chapters in the Howto manual on plotting to find the types which ASCEND will plot. Also see the ASCEND library of models supporting plotting: plot.a4l (and any of the other model files containing the name plot which have examples of plotting within them).

Statistics Prints out some information about the object tree in the Browser starting with the current object and going downward through its children, grandchildren, etc.

5.1.4 BROWSER FIND MENU

By name Search for an instance with a given qualified name and go there. The name of the instance to search for is defined in the dialog. This option may be useful for jumping around in the instance tree. Since names can be quite long, you may find this tool most useful when you have found the name elsewhere and can cut and then paste it into the dialogue box that opens for this tool.

By type You can search for objects of any particular type with certain attributes. The default type will list all fixed solver_vars for the problem. The allowable searches are best explained by examples as shown in Table 5-1 (with the third being the default just mentioned). The search

Table 5-1 Examples of the performance of the Find by type option

Type	Attribute	Low Value	High Value	Explanation
unit				Find all parts that are units.
solver_var	fixed			Find all refinements of solver_var with a part fixed
solver_var	fixed	TRUE		Find all refinements of solver_var with a part fixed where fixed==TRUE
stream	Ftot	4		Find all streams with part Ftot where value is 4 ± epsilon
stream	Ftot	4	10	Find all streams with part Ftot where 4 <= Ftot <= 10
relation	VALUE	0		Find all relations with a residual 0 ± epsilon
symbol	VALUE	ACH		Find all symbols where VALUE is ‘ACH’
symbol	VALUE	ACH	ACZ	find all symbols where ‘ACH’ <= VALUE <= ‘ACZ’
component_constant				Find all parts that are component_constants
symbol_constant	VALUE	UNDEFINED		Find all undefined symbol_constants. Works for all types with a value.

is loosely matched, i.e. any object that is of the type given, OR a refinement of the type given and matches the attribute qualifications, will be on the list of items found.

If there are no matches, there is no results box: just a message in a popup error message.

The results of the Find appear in a box and you can export one or more of the results in the box to the Browser or the Probe by selecting them and clicking on Browser or Probe. When you have finished exporting items to wherever you like, click on OK. Do close this box as the rest of the interface will ignore you until you do.

Notes:

- Clear any of the extra fields not required for your search before you hit OK. We will usually find nothing that matches if there are extra search parameters hanging around that don’t make sense.

- VALUE is a special keyword for dealing with atomic types. Variables and symbols have a value internally but not a child named VALUE. Similarly, relations have a residual but not as an accessible part with that name.
- Symbols and integers will be matched exactly if only a low value is given. The matching of symbols given a low and high value is done lexically according to the collating sequence of the machine in use.
- Frequently what you really want to see is the name of a set of things of a given type -- e.g. a case where you want to know what components are in a flowsheet. Find will return the instances though, not their common parent. Simply export one to the Browser and then click up a level to see the set of components in use.
- You can tab between fields in the Find by Type widget.
- You can select a type name in the library. Pick the type in the right window. Its name will appear in the lower middle window. Highling the name and use the typical method to copy a set of highlighted characters for your computer (e.g., Ctrl-c on a PC). Then use the typical way to paste into the type slot of the Find by Type Window (Ctrl-v on a PC).
- Epsilon is about 1e-8 in terms of the SI units for any real quantity.

Aliases

Find all the other names that the current object has in the simulation. For example, assume that you have named a simulation as fs. Assume further that the output stream from the mixer, m1, is merged with the input stream for the reactor, r1. Then, that stream is an object with two different names. Suppose you are looking at r1.feed as the current object. Asking for aliases will give the list

fs.r1.feed

fs.m1.output

If you pick one of the aliases, it can be exported to the BROWSER, the SOLVER or the PROBE. Alternate names for objects can also be created by ALIASES statements and by passing them into a parameterized MODEL.

Where created

Find the other names that the current object was CONSTRUCTED under. If an object is shown as being created under 4 names, it means that once there were 4 objects and that 3 were destroyed in merge

(ARE_THE_SAME) statements to reach the current unity. (Merging is expensive).

If you pick one of the names, it can be exported to the BROWSER, the SOLVER or the PROBE. Alternate names for objects can also be created by ALIASES statements or by passing them into a parameterized MODEL, but these names do not appear in the list of creations.

Clique Find all the instances that ARE_ALIKE with the current one. The instances shown are bound together so that if the formal type of one is changed, they are all upgraded with the first. Parameterized objects cannot be ARE_ALIKE'd because when parameters exist the formal type requires outside information (the parameters) in order to check that it is being used in a valid way.

Eligible variables Find real variables eligible to be fixed. If the solver is occupied by the same simulation, this query is thrown to the Solver. If not, the degrees of freedom are analyzed as if the current model were exported to the Solver.

Active Relations Find all the relations of the current object. You may tag one, several or all of the relations found and export them to the Probe. You may also export the first tagged relation to the Browser.

Operands If the current object is a relation, list all the operands in it. One or more of these may then be exported to the Probe. You may also export the first tagged operand to the Browser.

Pendings List in the Console window all the statements that the compiler failed to compile for the current Browser object.

5.1.5 BROWSER OPTIONS MENU

Hide Passed Parts Toggles the display of parts which were passed into the Browser object as passed parameters. Note that these shared objects were created by a parent (or grandparent, etc.) of the current Browser object and will appear on the list of parts for that parent.

Suppress Atoms This button toggles whether or not to show atomic instances in the upper right box of the Browser window.

Display Atom Values This button toggles whether to display values or to display the types of atoms in the child box (upper right side) of the Browser. For the case of relations, the residual shown with the relation is the last computed by the solver and not the residual at the current values of the variables.

Check Dimensionality This switch turns warnings about relation inconsistency off and on. In principle it should not be necessary, but for the quick and dirty model it is sometimes handy.

Save Options Save the current options in this menu. When you restart ASCEND, the system will reset the options to these saved settings.

Hide Names This option has a similar functionality from that of Hide Types in the ASCEND Library windows. That is, it will hide or unhide instances for browsing purposes. The difference, however, is that this option hides by name, not by type. To clarify, it is quite different to hide instances with the name fs than to hide all instances of type test_flowsheet.

UnHide Names Reverses the effect of the command Hide Names. A list of hidden names appear from which you can select what to unhide..

5.1.6 BROWSER VIEW MENU

Font Opens the window that lets you reset the fonts for this window. You can select the type of font, the style (bold, etc.) and the size for the font.

Open automatically Toggles a switch which, if set, will cause the Browser window to open whenever anything is placed into it by an export command.

Save window appearance Saves the current settings for this window for font settings and window size and placement on your computer screen. These become the default settings for opening this window in the future. These settings are saved in a *.a4o* text file for this window which the sytem stores in the subdirectory *ascdata* in your “home” directory.

5.1.7 BROWSER EXPORT MENU

to Solver Checks the model for exportability (must be of type MODEL without any pending compilation) and, if acceptable, sends it to the Solver.

Many to Probe Sends the child instances of the current part being browsed to the Probe. The types of instances sent to the Probe are selected in the filtering window shown in Figure 5-2. Every switch toggles whether or not to export each of types to the Probe.

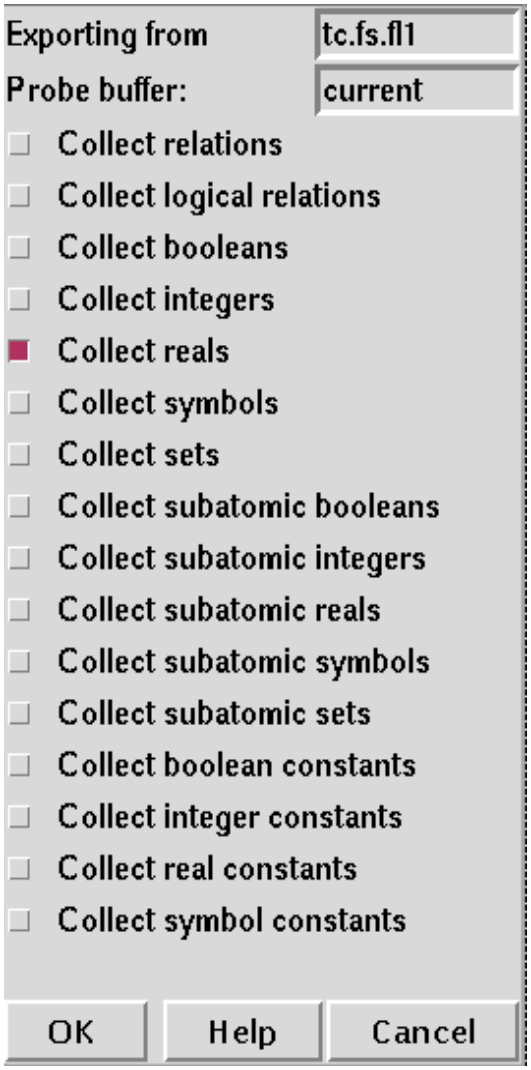

Figure 5-2 Filtering instances sent to the Probe

`Item to Probe` Exports the instance on the left box of the Browser to the Probe.

5.1.8 BROWSER HELP MENU

`On BROWSER` Brings up a text description of where to look for help on this window (i.e., it points to the pdf version of this document on the WWW.) You may, of course, look into the section mentioned in any local (but perhaps outdated) copy of the documentation.