PAW++

Physics Analysis Workstation

User’s Guide

Version 2.02 (September 1993)

Application Software Group

Computing and Networks Division

CERN Geneva, Switzerland
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PAW – Physics Analysis Workstation

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First edition - September 1993
Related Manuals

This document can be complemented by the following manuals:

- PAW, Physics Analysis Workstation, The Complete Reference [1]
- COMIS, Compilation and Interpretation System [2]
- HIGZ — High level Interface to Graphics and ZEBRA [4]
- KUIP — Kit for a User Interface Package [6]
- MINUIT — Function Minimization and Error Analysis [7]
- ZEBRA — Data Structure Management System [8]

This document has been produced using \LaTeX [9] with the \texttt{cernman} style option, developed at CERN. All pictures shown are produced with PAW and are included in PostScript [10] format in the manual.

A PostScript file \texttt{paw++\_ps}, containing a complete printable version of this manual, can be obtained by anonymous ftp as follows (commands to be typed by the user are underlined):

```
ftp asis01.cern.ch
Trying 128.141.201.136...
Connected to asis01.cern.ch.
Name (asis01:username): anonymous
331 Guest login ok, send e-mail address as password.
Password: your\_mailaddress
ftp> cd cernlib/docps.dir
ftp> get paw++.ps
ftp> quit
```
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Chapter 1: PAW++: A guided tour

PAW++ is a new and powerful OSF/Motif based Graphical User Interface to the popular Physics Analysis Workstation PAW. The graphical user interface makes the full and rich command set of PAW available to even the naive user. Simple point and click operations are enough to execute commands that were previously accessible only to expert users.

At present it is released on Unix workstations and VAX/VMS.

PAW++ has, in addition to the conventional command line and macro types of interface, the following dialogue modes:

Pull Down menus
They are useful to understand the command structure of the PAW system.

Command panels
They give a “panel representation” of the commands.

Object Browser
This is in many ways similar to the well-known browsers in the PC/MAC utilities or the visual tools on some workstations.

Direct graphics
One can click in the graphics area and identify automatically which object has been selected. A pop-up menu appears with a list of possible actions on this object. For example, by clicking with the right mouse button on a histogram, one can make directly a gaussian fit, a smoothing etc. Pop-up menus are available by clicking on the Graphics Window to automatically produce PostScript, Encapsulated PostScript, \LaTeX files or print the picture on your local printer.

Histogram Style Panel
Buttons are available to change histogram attributes, colours, line styles, fonts, and axes representation. 2-D histograms can be rotated interactively. Zooming and rebinning can be performed interactively in real time.

Ntuple Viewer
Just click on the Ntuple column name to histogram the column.

The new system is largely self-explanatory. Only a subset of PAW has been converted to this new user interface, but work is currently in progress to offer many new facilities in future releases.

On all system on which the CERNLIB is installed, it is enough to type paw++ to enter the system.

PAW++ starts up with three windows on the screen:

The “PAW++ Executive Window”
Which is compose with a menu bar, a Transcript Pad, a current working directory indicator and an Input Pad.

The “PAW++ Graphics 1”
window displays the graphics output from HIGZ/X11. Objects, e.g. histograms, displayed in the Graphics Window can be manipulated by pointing at them, pressing the right mouse button and selecting an operation from the popup menu. Pointing at the edge of the Graphics Window (between displayed object and window border) brings up a general popup menu. Up to 4 additional Graphics Window can be opened by selecting “Open New Window” from this menu.

The “PAW++ Main Browser”
displays all browsable classes and connected hbook files. Up to 4 additional browsers can be opened via the “View” menu of the “PAW++ Executive Window” or via the “Clone” button on the browsers. For more information on the browsers see the “Help” menus.
1.1 Overview

- The upper left corner is the **PAW++ Executive Window**, with its **Input Pad** at the bottom and the **Transcript Pad** at the top.
- The PAW++ Browser, where the various entities (pictures, 1-D and 2-D histograms and Ntuples) are all defined with their own symbol, is shown bottom left. A “pop-up” menu has been activated for the chosen 1-D histogram. Several actions like **Plot**, **Smooth**, **Fit** etc... can be performed via this menu.
- The **Graphics Window** is seen top right. A 1-D view of the data points and two 2-D views (a Surface-plot and a colored contour plot) are shown. On the 1-D view, two 1-D histograms are superimposed. The results of a “smoothing” type of fit to the data points is also drawn. Information about the data and the fit can be found in the inserted window.
- The **Histogram Style Panel** at the lower right allows graphics attributes of the histogram to be controlled.
– The upper left corner shows the **Ntuple Viewer**. The left window shows the name of the various variables, characterizing the selected Ntuple. Other windows and press-buttons specify which combinations of the various variables and which events have to be treated (plotted, scanned, ...).
– The lower left contains the **PAW++ Browser**, with this time an Ntuple selected. A double on a Ntuple icon open automatically the **Ntuple Viewer** on the active Ntuple.
– The **Graphics Window** is seen top right and shows a 3-D view of the combination of three variables, whose cuts are specified with the **Cut Editor** (see below).
– Direct graphics interactions with Ntuple data are possible. Just by clicking on a point in the **Graphics Window**, the event description is displayed in the **PAW++ Locate** window.
– The **Cut Editor** panel, shown at the lower right, allows various combinations of cuts to be specified and applied.
This window allows to type commands on the keyboard like in the normal PAW system. In fact this window is the \texttt{kxterm} program provide with the KUIP package.

This terminal emulator combines the best features from the (now defunct) Apollo DM pads (like: \textbf{Input Pad} and \textbf{Transcript Pad}, automatic file backup of \textbf{Transcript Pad}, string search in pads, etc.) and the Korn shell emacs-style command line editing and command line recall mechanism.

Commands are typed in the \textbf{Input Pad} behind the application prompt. Via the toggle buttons the \textbf{Input Pad} and/or \textbf{Transcript Pad} can be placed in hold mode. In hold mode one can paste or type a number of commands into the \textbf{Input Pad} and edit them without sending the commands to the application. Releasing the hold button will causes \texttt{kxterm} to submit all lines, upto the line containing the cursor, to the application. To submit the lines below the cursor, just move the cursor down. In this way one can still edit the lines just before they are being submitted to the application.

In the \textbf{Input Pad} one can type, retrieve and edit command line with the help of a Korn shell emacs-style command line editing mode. See in appendix the complete list of the editing keys.
The Transcript Pad shows the executed commands and command output. When in hold mode the transcript pad does not scroll to make the new text visible. Mouse operations like “Copy Paste” are allowed in the transcript pad. It is also possible to search a character string (see the menu bar description).

Every time the current directory is changed, the Current working directory indicator is updated. The current working directory can be changed by clicking on an item in the PATH window of the Main Browser or by clicking on an icon directory in the Main Browser itself.

Hold buttons.

1. Allows manipulation of the Transcript Pad.
2. Allows character string search, copy/paste in the Transcript Pad.
3. Allows to invoke other panel.
4. Some general settings are available in this menu.
5. Online help.

1.2.1 The Executive Window menu bar

In this section, is describe the full functionality of the pull down menu available in the Menu Bar of the Executive Window.

File

<table>
<thead>
<tr>
<th>File</th>
<th>Edit</th>
<th>View</th>
<th>Options</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>About Kxterm...</td>
<td>Displays version information about Kxterm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>About &lt;Application&gt;...</td>
<td>Displays version information about the application Kxterm is servicing.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Save Transcript</td>
<td>Write the contents of the transcript pad to the current file. If there is no current file a file selection box will appear.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Save Transcript As...</td>
<td>Write the contents of the transcript pad to a user-specified file.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Print...</td>
<td>Print the contents of the transcript pad (not yet implemented).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kill</td>
<td>Send a SIGINT signal to the application to cause it to core dump. This is useful when the application is hanging or blocked. Use only in emergency situations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exit</td>
<td>Exit Kxterm and the application. When this option is selected or when EXIT is typed in the Input Pad, the following panel is displayed:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.2. The Executive Window

The exit is performed.

The exit procedure is canceled.

Edit

Cut  Remove the selected text. The selected text is written to the Cut and Paste buffer. Using the “Paste” function, it can be written to any X11 program. In the transcript pad “Cut” defaults to the “Copy” function.

Copy  Copy the selected text. The selected text is written to the Cut and Paste buffer. Using the “Paste” function, it can be written to any X11 program.

Paste  Insert text from the Cut and Paste buffer at the cursor location into the Input Pad.

Search...  Search for a text string in the transcript pad.

View

Show Input  Show in a window all commands entered via the Input Pad.

Command Panel  Command Panel
Browser  Browser
Style Panel  Style Panel
Chapter 1. PAW++: A guided tour

Options

- **Clear Transcript Pad**: Clear all text off of the top of the transcript pad.
- **Echo Command**: Echo executed commands in transcript pad.
- **Timing**: Report command execution time (real and CPU time).
- **Iconify**: Iconify Kxterm and all windows of the application.

Help

- **On Kxterm**: The help you are currently reading.
- **On Edit Keys**: Help on the emacs-style edit key sequences.

1.3 The Main Browser

The KUIP/Motif Browser interface is a general tool to display and manipulate a tree structure of objects which are defined either by KUIP itself (commands, files, macros, etc.) or by the application.

The “Clone” button at the bottom creates a new independent browser window. The “Exit” button destroys the browser window. The **Main Browser** cannot be destroyed (only iconized).

The middle part of the browser is divided into two windows:

1. The left hand “class window” shows the list of all currently connected classes of objects. Some classes, e.g. the command tree and the file system, are predefined. Other classes allow to attach new files using the commands in the “File” menu. Clicking with the left mouse button on one of the items in the class window displays its content in the other window. Pressing the right mouse button inside the class window shows a popup menu of possible operations, e.g. creating a new object in the current directory.

2. The right hand “object window” shows the content of the currently selected class directory. The “View” menu allows the change the way objects are displayed, i.e. to choose the icon size and the amount of information shown for each object. Objects are selected by clicking on them with the left mouse button. Pressing the right mouse button pops up a menu of possible operations depending on the object type.

An item in a popup menu is selected by pointing at the corresponding line and releasing the right mouse button. Double clicking with the left mouse button is equivalent to selecting the first menu item.

Each menu item executes a command sequence where the name of the selected object is filled into the appropriate place. By default the command is executed immediately whenever possible. The commands executed can be seen by selecting “Echo Commands” in the “Options” menu of the **Executive Window**.

In case some mandatory parameters are missing a panel is displayed where the remaining arguments have to be filled in. The command is executed then by pressing the “OK” or “Execute” button in that panel. (If it is not the last one in the sequence of commands bound to the menu item the application is blocked until the “OK” or “Cancel” button is pressed.)

The immediate command execution can be inhibited by holding down the CTRL-key BEFORE pressing the right mouse button. Some popup menus also contain different menu item for immediate and delayed execution, e.g. “Execute” and “Execute...” for class “Commands”
The path of the currently selected directory is always displayed below the menu bar. The directory can be changed by pointing at the tail of the wanted subpath and clicking the left mouse button. Clicking a second time on the same path segment performs the directory change and updates the object window. To go downwards in the directory hierarchy double click on the subdirectory displayed in the object window.

1. Current PATH ("PATH window").
2. Class window.
3. Name of file currently selected in the class window.
4. Name of the object currently selected in the object window.
5. Number and type of object currently in the the object window.
6. Object window.
1 File menu.
2 View menu.
3 Options menu.
4 Commands menu.
5 Help menu.
6 Clone button.
7 Exit button.

1.3.1 The objects in the “object window”

This section describes all the PAW++ object available in the Main Browser.

**HBOOK files**

Double click with the left mouse button on this icon, open the corresponding HBOOK file with the command `HISTOGRAM/FILE`.

Select a HBOOK files icon with the left mouse button and press the right mouse button to obtain the following menu:

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>Open the highlighted HBOOK file in read-only mode.</td>
</tr>
<tr>
<td>Open Update Mode</td>
<td>Open the highlighted HBOOK file in update mode.</td>
</tr>
</tbody>
</table>

Note that the HBOOK file name is displayed in the menu title.

**1D histograms**

Double click with the left mouse button on this icon, produce the plot of the corresponding histogram with the command `HISTOGRAM/PL0T`. The histogram becomes the current histogram for the Histogram Style Panel.

Select a 1D histograms icon with the left mouse button and press the right mouse button to obtain the following menu:
1.3. The Main Browser

Plot
Plot the corresponding histogram (default action). The histogram becomes the current histogram for the Histogram Style Panel.

Fit...
Perform the command Histo/Fit on the corresponding histogram. The command panel is automatically displayed.

Fit Gauss
Perform a gaussian fit on the corresponding histogram.

Fit Exp
Perform an exponential fit on the corresponding histogram.

Fit Const
Perform a P0 fit on the corresponding histogram.

Fit Linear
Perform a P1 fit on the corresponding histogram.

Smooth
Smooth the corresponding histogram.

Smooth...
Perform the command Smooth on the corresponding histogram. The command panel is automatically invoked.

Copy
Copy corresponding histogram onto another histogram. The command panel is automatically invoked.

Reset
Reset the corresponding histogram.

Delete
Delete the corresponding histogram.

Note that the histogram identifier is displayed in the menu title.

2D histograms

Double click with the left mouse button on this icon, produce the plot of the corresponding histogram with the command HISTOGRAM/PL0T. The histogram becomes the current histogram for the Histogram Style Panel.

Select a 2D histograms icon with the left mouse button and press the right mouse button to obtain the following menu:
Chapter 1. PAW++: A guided tour

### Plot
Plot the corresponding histogram (default action). The histogram becomes the current histogram for the **Histogram Style Panel**.

### Project X
Generate the X projection, perform the projection and plot the result (commands `ProX`, `HiProj`, and `HiPlot`).

### Project Y
Generate the Y projection, perform the projection and plot the result (commands `ProY`, `HiProj`, and `HiPlot`).

### Slice X
Generate the X slices, perform the projection and plot the first slice (commands `SliX`, `HiProj`, and `HiPlot`).

### Slice Y
Generate the Y slices, perform the projection and plot the first slice (commands `SliY`, `HiProj`, and `HiPlot`).

### Band X
Generate the X bands, perform the projection and plot the first band (commands `BanX`, `HiProj`, and `HiPlot`).

### Band Y
Generate the Y bands, perform the projection and plot the first band (commands `BanY`, `HiProj`, and `HiPlot`).

### Smooth
Smooth the corresponding histogram.

### Smooth...
Perform the command `Smooth` on the corresponding histogram. The command panel is automatically invoked.

### Copy
Copy corresponding histogram onto another histogram. The command panel is automatically invoked.

### Reset
Reset the corresponding histogram.

### Delete
Delete the corresponding histogram.

Note that the histogram identifier is displayed in the menu title.
1.3. The Main Browser

**Ntuples**

Double click with the left mouse button on this icon, open the Ntuple Viewer on the corresponding Ntuple.

Select a Ntuples icon with the left mouse button and press the right mouse button to obtain the following menu:

- **Open Ntuple Viewer**
  - Open Ntuple Viewer on the highlighted Ntuple.
- **Project...**
  - Project the highlighted Ntuple. The Command panel Ntuple/Proj is automatically invoked.
- **Print**
  - Print the highlighted Ntuple (Command Ntuple/Print).

Note that the ntuple identifier is displayed in the menu title.

**PAW commands**

Double click with the left mouse button on this icon, execute the corresponding PAW command.

Select a PAW commands icon with the left mouse button and press the right mouse button to obtain the following menu:

- **Execute**
  - Execute the command with the default parameters. If a mandatory parameter is missing, the command panel is automatically invoked.
Chapter 1. PAW++: A guided tour

Execute... Display the command panel.
Help Display the help on the command.
Usage Display the command usage in the Transcript Pad of the Executive Window.
Manual Equivalent to HELP.
Set Command This command becomes the one executed when a directive typed on the keyboard is not an existing PAW command.
Deactivate The command is deactivated.

Note that the command name is displayed in the menu title.

Deactivated PAW commands

Double click with the left mouse button on this icon, execute the help on corresponding PAW command.

Select a Deactivated PAW commands icon with the left mouse button and press the right mouse button to obtain the following menu:

Help Display the help on the command.
Activate The command is activated.

Note that the deactivated command name is displayed in the menu title.

Up

Double click with the left mouse button on this icon, allow to go one level up in the directory tree. This icon is always the first one of the content window.

Select a Up icon with the left mouse button and press the right mouse button to obtain the following menu:

List Allow to go one level up in the directory tree.
1.3. The Main Browser

**Directory**

Double click with the left mouse button on this icon, change the current working directory.

Select a **Directory** icon with the left mouse button and press the right mouse button to obtain the following menu:

![Directory cmotif]

- List

Change the current working directory.

**Read-Write files**

Double click with the left mouse button on this icon, invoke the editor on the corresponding file.

Select a **Read-Write files** icon with the left mouse button and press the right mouse button to obtain the following menu:

![Read/Write File Paw]

- Edit
  - Edit the file.
- View
  - Read the file.
- Delete
  - Delete the file.

Note that the file name is displayed in the menu title.

**Read-only files**

Double click with the left mouse button on this icon, invoke the editor in view mode on the corresponding file.

Select a **Read-only files** icon with the left mouse button and press the right mouse button to obtain the following menu:
Chapter 1. PAW++: A guided tour

View
Read the file.
Delete
Delete the file.

Note that the file name is displayed in the menu title.

No-access files

Double click with the left mouse button on this icon, invoke the shell command chmod on the corresponding file.

Select a No-access files icon with the left mouse button and press the right mouse button to obtain the following menu:

Chmod
Try to change the permissions of the file.

Note that the file name is displayed in the menu title.

Executable files

Double click with the left mouse button on this icon, invoke the command SHELL on the corresponding file.

Select a Executable files icon with the left mouse button and press the right mouse button to obtain the following menu:

Execute
Invoke the command SHELL on the file.
1.3. The Main Browser

Execute... Open the command panel SHELL with the file name.
Edit Edit the file.
View Read the file.
Delete Delete the file.

Note that the file name is displayed in the menu title.

**PAW Macros**

Double click with the left mouse button on this icon, execute the corresponding macro.

Select a **PAW Macros** icon with the left mouse button and press the right mouse button to obtain the following menu:

![Macro Menu](image)

- Exec Execute the macro.
- Exec... Open the command panel EXEC with the macro name. It is useful to give parameters to the macro.
- Edit Edit the macro.
- View Read the macro.
- Delete Delete the macro.

Note that the macro name is displayed in the menu title.

**Pictures**

Double click with the left mouse button on this icon, plot the corresponding picture.

Select a **Pictures** icon with the left mouse button and press the right mouse button to obtain the following menu:
Plot the highlighted picture.

Do PostScript

Produce the PostScript file PNAME.ps, where PNAME is the name of the highlighted picture.

Create

Create a new picture. The command panel Picture/Create is automatically invoked.

Rename

Rename the highlighted picture. The command panel Picture/Rename is automatically invoked.

Delete

Rename the highlighted picture.

Chains

Double click with the left mouse button on this icon, allow to go one level deeper in the chain tree.

Select a Chains icon with the left mouse button and press the right mouse button to obtain the following menu:

List .......... Show Tree .......... Delete Chain ............

Last chain level

Last chain element.

Select a Last chain level icon with the left mouse button and press the right mouse button to obtain the following menu:
1.3. The Main Browser

![Chain Entry //lun1]

List
Delete Chain Entry

ZEBRA Stores

Double click with the left mouse button on this icon, allow to go inside the corresponding ZEBRA store.

Select a ZEBRA Stores icon with the left mouse button and press the right mouse button to obtain the following menu:

![Stores M_Store00._PAWC_]

List
Show store DZSTOR

List
Show store DZSTOR

Display divisions of the store
Show parameters of the store (CALL DZSTOR)

ZEBRA Divisions

Double click with the left mouse button on this icon, allow to go inside the corresponding ZEBRA division.

Select a ZEBRA Divisions icon with the left mouse button and press the right mouse button to obtain the following menu:

![Divisions Div02.QDIV2]

List
Display division
Snap division
Verify division
Collect garbage
Set filter for banks

List
Display banks of the division as icons.
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Display division
Show layout of banks in divisions graphically.
Snap division
Show a snapshot of division parameters. (CALL DZSNAP).
Verify division
Verify division (CALL DZVERI).
Collect garbage
CALL MZGARB in selected division.
Set filter for banks
Allow to display only banks whose hollerith identifiers match a wild card selection.

ZEBRA Banks

Double click with the left mouse button on this icon, draw the bank tree from the corresponding ZEBRA bank.

Select a ZEBRA Banks icon with the left mouse button and press the right mouse button to obtain the following menu:

Display bank tree
Display graphically the structure below the selected bank (see picture banktree.eps).
Show cont documented
Display the data of the bank with their description if a documentation data base is provided (see CERN Q101).
DZ Show contents
CALL DZSHOW for selected bank.
Show system words
List contents of the links and system words.
Survey bank tree
CALL DZSURV for selected bank
Put into vector
Put data contents of the bank into a KUIP vector.
Show documentation
Display the documentation for the bank (if provided).
Edit documentation
Edit a bank descriptor, if no available yet provide a template.
Modify data words
Self explaining.
Drop bank (tree)
Self explaining.
1.3. The Main Browser

**RZ Files**

Double click with the left mouse button on this icon, allow to go inside the corresponding ZEBRA/RZ file.

Select a **RZ Files** icon with the left mouse button and press the right mouse button to obtain the following menu:

- **Close RZfile**: Self explaining.
- **List**: Display keys.
- **List directory**: CALL RZLDIR.
- **Show key definition**: self explaining.
- **Set filter on keys**: Allow to display only entries whose key words match a wild card selection.
- **Show status**: CALL RZSTAT.

**RZ Directories**

Double click with the left mouse button on this icon, allow to go inside the corresponding ZEBRA/RZ directory.

Select a **RZ Directories** icon with the left mouse button and press the right mouse button to obtain the following menu:

- **List**: ................
- **List directory (RZLDIR)**: ................
- **Show key definition**: ................
- **Set filter on keys**: ................
RZ Keys

Double click with the left mouse button on this icon, allow to read into memory the corresponding ZEBRA/RZ key.

Select a RZ Keys icon with the left mouse button and press the right mouse button to obtain the following menu:

- Read key into memory: Allow to inspect the data of a key.
- Show key definition: Self explaining.
- Show key words: Self explaining.
- Set filter on keys: See above.

1.3.2 The Main Browser Menu Bar

In this section, is describe the full functionality of the pull down menu available in the Menu Bar of the Main Browser.

File

- Open Hbook File: Display the Open Arguments panel (see after).
- Close Hbook File: Display the Close Arguments panel (see after).
Chapter 1. PAW++: A guided tour

1. Toggle buttons to choose the opening mode.
2. Filter apply on the file list.
3. Possible logical units. Only the free units are displayed. The next free unit is highlighted. Any other unit is invalid.
4. Possible record length. A record length of 0 means that the system will compute the correct one automatically.

1. The file is open and this panel is closed.
2. File name of the opened file.
3. Apply the filter defined in 2.
4. List of the subdirectories available. Double click on a directory name change the current directory.
5. Cancel the current opened panel and close it.
6. List of the file in the current directory matching the filter.
7. Help

Note that a double click with the left mouse button on a HBOOK file icon in the object window of the Main Browser open also the HBOOK file. This panel is useful to specify a filter different from the default filter *.hbook used in the object window.
1.3. The Main Browser
List of the currently connected hbook files.

A simple click with the left mouse button a file name in the connected files list, highlight the filename and put it in the Close file field.

Name of the file to be closed. This field can be filled directly by tipyng on the keyboard, or by a simple click with the left mouse button in the Connected Files list.

When a file is selected, clicking on this button or typing <CR> allows to perform the action (close the file) and close the panel.

Close the selecte file and leave the panel opened.

Cancel the current operation and close the panel.

Give some help.

View

This pull down menu allows to define the “viewing” for the objects in the “object window” of the Main Browser.
1.3. The Main Browser

Icons: icons and the object identifiers are displayed.

Small Icons: small icons and the object identifiers are displayed.
No Icons: object identifiers and titles are displayed.

Titles: small icons and the object identifiers and titles are displayed.
1.3. The Main Browser

Options

```
Raise Window
Command Panel...
Command Panel Help...
```

Commands

This menu allows to access the tree of the PAW commands. Only the top levels are describe in this section. Note the tree of the PAW commands can also be accessed via the item “Commands” in the “PATH Window” of the Main Browser.

```
Kuip
Macro
Vector
Histogram
Function
Ntuple
Graphics
Picture
Fortran
Network
Dzdoc
```

- **Kuip**: Command Processor commands.
- **Macro**: Macro Processor commands.
- **Vector**: Vector Processor commands.
- **Histogram**: Manipulation of histograms, Ntuples.
- **Function**: Operations with Functions. Creation and plotting.
- **Ntuple**: Ntuple creation and related operations.
- **Graphics**: Interface to the graphics packages HPLOT and HIGZ.
- **Picture**: Creation and manipulation of HIGZ pictures.
- **Fortran**: Interface to MINUIT, COMIS, SIGMA and FORTRAN Input/Output.
- **Network**: To access files on remote computers.
- **Dzdoc**: .........................
Help

1.3.3 Information Windows

**Top**

<table>
<thead>
<tr>
<th>Path:</th>
<th>//LUN1</th>
</tr>
</thead>
</table>

**Bottom**

```
File: pawdemo.hbook
30: TEST OF N–TUPLES
```

[Image of GUI window with path, directory, file, and buttons]
1.3.4 Content Window

In this section are describe the different menu available in the “Content Window”.

Commands

List ........................................
Set Default .................................
Help .........................................
Files

List
Edit
Help
1.3. The Main Browser

Macro

List

Edit

Help
Zebra

```
List
Open bank doc Rzfile
Add doc directory
Put doc into Rzfile
Display bak tree
Help
```

1.3. The Main Browser

Hbook

List

Help
Chains

List ........................................
Delete All Chains ..............................
Help ........................................
1.3. The Main Browser

[Image of Chain Tree diagram showing MB05, MB05, MB1, and newaptule.hbook nodes]
List
Create 1d
Create Profile
Create Var-Bin
Create 2d
Create N-tuple
Clear
Help

Create a 1d histogram.
Create a Profile histogram.
Create a variable bin size histogram.
Create a 2d histogram.
Create a row wise Ntuple histogram.

---------
---------
---------
---------
Hbook Files (//LUNn)

List
Copy to //PAWC
Add to //PAWC
Write from //PAWC...
Create N-tuple
Clear
Close
Help

Create a row wise Ntuple histogram.
PAW++ allows direct graphics manipulation of the objects like Histograms or Ntuples. To perform actions on the object from the **Graphics Window**, it is enough to move the mouse cursor on the **Graphics Window** and to click with the right mouse button on the object. A pull down menu will be displayed according to the object picked. In this section are described the different menus available in the **Graphics Window**.
1.4.1 The Graphics Window

When no object is picked in the **Graphics Window** for instance when the background of the window is picked the following menu is displayed.

<table>
<thead>
<tr>
<th>Graphics Window 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot</td>
</tr>
<tr>
<td>Style Panel ...</td>
</tr>
<tr>
<td>Double Buffer On</td>
</tr>
<tr>
<td>Double Buffer Off</td>
</tr>
<tr>
<td>Do PostScript ...</td>
</tr>
<tr>
<td>Do Encapsulated PostScript ...</td>
</tr>
<tr>
<td>Do LaTex ...</td>
</tr>
<tr>
<td>Print</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plot</th>
<th>Picture/Plot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style Panel...</td>
<td>show_histoStyle</td>
</tr>
<tr>
<td>Double Buffer On</td>
<td>Igset 2BUF 1</td>
</tr>
<tr>
<td>Double Buffer Off</td>
<td>Igset 2BUF 0</td>
</tr>
<tr>
<td>Do PostScript...</td>
<td>paw.ps</td>
</tr>
<tr>
<td>Do Encapsulated PostScript...</td>
<td>paw.eps</td>
</tr>
<tr>
<td>Do LaTex...</td>
<td>paw.tex</td>
</tr>
<tr>
<td>Print</td>
<td>Picture/Print</td>
</tr>
<tr>
<td>Open New Window</td>
<td>Work [this] 0A</td>
</tr>
<tr>
<td>Close Window</td>
<td>Work [this] C</td>
</tr>
<tr>
<td>Activate Window</td>
<td>Work [this] A</td>
</tr>
<tr>
<td>Deactivate Window</td>
<td>Work [this] D</td>
</tr>
</tbody>
</table>

1.4.2 Ntuple

When a Ntuple is picked in **Graphics Window** with the right mouse button, the following menu is displayed:

<table>
<thead>
<tr>
<th>Ntuple 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Ntuple Viewer</td>
</tr>
<tr>
<td>Project ...</td>
</tr>
<tr>
<td>Print</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Open Ntuple Viewer</th>
<th>default_action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project...</td>
<td>Ntuple/Proj IDN=[this]</td>
</tr>
<tr>
<td>Print</td>
<td>Ntuple/Print [this]</td>
</tr>
</tbody>
</table>
1.4.3 1D-Histogram

When a 1D-Histogram is picked in Graphics Window with the right mouse button, the following menu is displayed:

```
1d-Histogram 10

Fit...
Fit Gauss
Fit Exp
Fit Const
Fit Linear

Smooth
Smooth...

Line
Curve
Bar Chart
Marker
Stars
Error Bars
Error Bars (lines)
Error Rectangles
Error: Filled Area
Error: Smoothed Area
Lego
Filled Lego
Default
```

<table>
<thead>
<tr>
<th>Command</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fit...</td>
<td>Histo/Fit [this]</td>
</tr>
<tr>
<td>Fit Gauss</td>
<td>Histo/Fit [this] G</td>
</tr>
<tr>
<td>Fit Exp</td>
<td>Histo/Fit [this] E</td>
</tr>
<tr>
<td>Fit Const</td>
<td>Histo/Fit [this] P0</td>
</tr>
<tr>
<td>Fit Linear</td>
<td>Histo/Fit [this] P1</td>
</tr>
<tr>
<td>Smooth</td>
<td>Smooth [this]</td>
</tr>
<tr>
<td>Smooth...</td>
<td>Smooth [this]</td>
</tr>
<tr>
<td>Line</td>
<td>Histo/Plot [this] L</td>
</tr>
<tr>
<td>Curve</td>
<td>Histo/Plot [this] C</td>
</tr>
<tr>
<td>Bar Chart</td>
<td>Histo/Plot [this] B</td>
</tr>
<tr>
<td>Marker</td>
<td>Histo/Plot [this] P</td>
</tr>
<tr>
<td>Stars</td>
<td>Histo/Plot [this] *</td>
</tr>
<tr>
<td>Error Bars</td>
<td>Histo/Plot [this] E</td>
</tr>
<tr>
<td>Error Bars (lines)</td>
<td>Histo/Plot [this] E1</td>
</tr>
<tr>
<td>Error Rectangles</td>
<td>Histo/Plot [this] E2</td>
</tr>
<tr>
<td>Error: Filled Area</td>
<td>Histo/Plot [this] E3</td>
</tr>
<tr>
<td>Error: Smoothed Area</td>
<td>Histo/Plot [this] E4</td>
</tr>
<tr>
<td>Lego</td>
<td>Histo/Plot [this] LEGO</td>
</tr>
<tr>
<td>Filled Lego</td>
<td>Histo/Plot [this] LEG01</td>
</tr>
<tr>
<td>Default</td>
<td>Histo/Plot [this]</td>
</tr>
</tbody>
</table>
### 2D-Histogram

When a 2D-Histogram is picked in **Graphics Window** with the right mouse button, the following menu is displayed:

<table>
<thead>
<tr>
<th>2d-Histogram 20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project X</strong></td>
</tr>
<tr>
<td><strong>Project Y</strong></td>
</tr>
<tr>
<td><strong>Slice X</strong></td>
</tr>
<tr>
<td><strong>Slice Y</strong></td>
</tr>
<tr>
<td><strong>Band X</strong></td>
</tr>
<tr>
<td><strong>Band Y</strong></td>
</tr>
<tr>
<td><strong>Smooth</strong></td>
</tr>
<tr>
<td><strong>Smooth...</strong></td>
</tr>
<tr>
<td><strong>Boxes</strong></td>
</tr>
<tr>
<td><strong>Color</strong></td>
</tr>
<tr>
<td><strong>Hidden Lines Surface</strong></td>
</tr>
<tr>
<td><strong>Color Level Surface (1)</strong></td>
</tr>
<tr>
<td><strong>Color Level Surface (2)</strong></td>
</tr>
<tr>
<td><strong>Surface and Contour</strong></td>
</tr>
<tr>
<td><strong>Gouraud Shaded Surface</strong></td>
</tr>
<tr>
<td><strong>Hidden Lines Lego</strong></td>
</tr>
<tr>
<td><strong>Filled Lego</strong></td>
</tr>
<tr>
<td><strong>Color Level Lego</strong></td>
</tr>
<tr>
<td><strong>Contour Plot</strong></td>
</tr>
<tr>
<td><strong>Filled Contour Plot</strong></td>
</tr>
<tr>
<td><strong>Arrow Plot</strong></td>
</tr>
<tr>
<td><strong>Text</strong></td>
</tr>
<tr>
<td><strong>Default</strong></td>
</tr>
</tbody>
</table>
1.4.5 X Axis

When a X-Axis is picked in Graphics Window with the right mouse button, the following menu is displayed:

```
logarithmic
linear

Sort in alphabetical order
Sort in reverse alphabetical order
Sort by increasing channel contents
Sort by decreasing channel contents

Number of divisions...
Tick marks length...
Values Distance...
Character Font...
Axis Color...
```

- Logarithmic: Option LOGX ; Hist/plot [this]
- Linear: Option LINX ; Hist/plot [this]
- Sort in alphabetical order: Sort [this] AX ; Hist/plot [this]
- Sort in reverse alphabetical order: Sort [this] EX ; Hist/plot [this]
- Sort by increasing channel contents: Sort [this] DX ; Hist/plot [this]
- Sort by decreasing channel contents: Sort [this] VX ; Hist/plot [this]
- Number of divisions: -Set NDVX ; Hist/plot [this]
- Tick marks length: -Set XTIC ; Hist/plot [this]
- Values Distance: -Set YVAL ; Hist/plot [this]
- Character Font: -Set VFON ; Hist/plot [this]
- Axis Color: -Set XCOL ; Hist/plot [this]
1.4.6 Y Axis

When a Y-Axis is picked in Graphics Window with the right mouse button, the following menu is displayed:

Logarithmic
Option LOGY ; Hist/plot [this]
Linear
Option LINY ; Hist/plot [this]
Sort in alphabetical order
Sort [this] AY ; Hist/plot [this]
Sort in reverse alphabetical order
Sort [this] EY ; Hist/plot [this]
Sort by increasing channel contents
Sort [this] DY ; Hist/plot [this]
Sort by decreasing channel contents
Sort [this] VY ; Hist/plot [this]
Number of divisions...
-Set NDVY ; Hist/plot [this]
Tick marks length...
-Set YTIC ; Hist/plot [this]
Values Distance...
-Set XVAL ; Hist/plot [this]
Character Font...
-Set VFON ; Hist/plot [this]
Axis Color...
-Set YCOL ; Hist/plot [this]
1.4.7 Locate on Histograms

To retrieve interactively on the Graphics Window an histogram identifier a bin number, a \((X, Y)\) position etc..., place the mouse cursor on the graphics area and click with the left mouse button on the interesting region. The information about the picked histogram will appear in the window called **PAW++ Locate**.

- 1D Histogram (with LOG scale).
- 2D Histogram.
- **PAW++ Locate** window.
- To release the Output window.

Info the the 1D Histogram.
(2) Info the the 2D Histogram.
1.4.8 Locate on Ntuples

Just by clicking with the left mouse button on a Ntuple drawing, one can get the event description in the PAW++ Locate window. If the mouse cursor is moved on the Ntuple drawing with the left mouse button pressed, the event description will change in real time in PAW++ Locate.

1. Ntuple drawing.
2. PAW++ Locate window.
3. To release the Output window.
4. Event description.
1.4.9 Integrate Histograms

To integrate interactively an histogram, place the mouse cursor on the bin from which the integration will start, and drag the cursor with the left mouse button pressed to the last bin. The result will appear in real time in a separated window called **PAW++ Locate**.

1. Integrated area.
2. Output window. It is possible to copy (via the mouse) the text inside this window.
3. To release the Output window.

4. Histogram identifier.
First bin for the integration.
Last bin for the integration.
Value of the integral.
Normalized integral.
“Mathematical” integral. Each bin contribution is multiply by the bin width.
1.5 The Histogram Style Panel

The Histogram Style Panel allows to manipulate and present histograms. It works on one histogram only: the “Current histogram”. To set the current histogram it is enough to plot it for the Main Browser, via a double click on the icon.

1. Plot the current histogram.
2. Add informations on the plots.
3. Define the graphical option used to plot the current histogram.
4. Reset the default attributes.
5. Define the coordinate system used to draw lego and surface plots.
6. Define attributes used to draw the current histogram.
7. Close the Histogram Style Panel.

1. File menu.
2. Options menu.
3. Current style name.
4. Current histogram name and type.
1.5.1 The Histogram Style Panel Menu Bar

File

- **Open Style**
  - Allows to choose and execute a “Style Macro”. This “Style Macro” becomes the “current style”. This field in the Histogram Style Panel is updated with the “current style” name. The “Style Macro” have by default the extension `.sty`.

- **Save Style**
  - Save the “current style”. When a style is saved, all the current attribute values are saved in the “Style Macro”.

- **Save Style As...**
  - Save the “current style” with a new name.

- **Close**

Options

- **Automatic Refresh**
  - By default the “Automatic Refresh” is on: each time the “current picture” is changed, the graphics window is updated. When this mode is off, the user has to click on one of the Apply button available.
  - Each time a new histogram, vector, or ntuple drawing is produced, a clear window is performed. To superimpose all the drawing on the same image, it is enough to put this option on. This option is the equivalent of the option S in the command HIST0/PL0T.
1.5.2 Plot Info

This set of toggle buttons allow to add some useful information on the current plot. If the Automatic refresh mode is on, the plot is automatically refreshed.

Statistics... Allow to draw (or not) the statistics on the plot (PAW command `OPTION STAT`). When the toggle button is set on, a panel is displayed in order to specify which parameters will be visible.

Fits... Allow to draw (or not) the fit parameters on the plot (PAW command `OPTION FIT`). When the toggle button is set on, a panel is displayed in order to specify which parameters will be visible.

File Name... Allow to draw (or not) the file name on the plot (PAW command `OPTION FILE`). When the toggle button is set on, a panel is displayed in order to specify the file name position.

Date... Allow to draw (or not) the date on the plot (PAW command `OPTION DATE`). When the toggle button is set on, a panel is displayed in order to specify the date position.

Statistics...

This panel is the equivalent of the PAW command `SET STAT`. It allows to specify which statistics informations are displayed on the plot.

Histogram ID The histogram identifier is displayed.
Entries The number of entries is displayed.
Mean value The mean value is displayed.
R.M.S. The R.M.S. is displayed.
Underflows The underflows are displayed.
Overflows The overflows are displayed.
All channels The content of the total number of channel is displayed.
1.5. The Histogram Style Panel

**Fits ...**

This panel is the equivalent of the PAW command `SET FIT`. It allows to specify which fit parameters are displayed on the plot.

- **Chi Square**  
  The chi square is displayed.

- **Errors**  
  The errors are displayed.

- **Parameters**  
  The fit parameters are displayed.

**File Name ...**

This panel is the equivalent of the PAW command `SET FILE`. It allows to specify the file name position on the plot.

- **Top Left**  
  The file name is drawn on the top left of the plot (default).

- **Top Right**  
  The file name is drawn on the top right of the plot.

- **Bottom Left**  
  The file name is drawn on the bottom left of the plot.

- **Bottom Right**  
  The file name is drawn on the bottom left of the plot.
Date ...

This panel is the equivalent of the PAW command SET DATE. It allows to specify the date position on the plot.

1.5.3 Style

Object Attributes... Invoke the “Object Attributes” panel.
Viewing Angles... Invoke the “Viewing Angles” panel.
Axis Scaling... Invoke the “Axis Scaling” panel.
General Attributes... Invoke the “General Attributes” panel.
Geometry... Invoke the “Geometry” panel.
Axis Settings... Invoke the “Axis Settings” panel.
Zones... Invoke the “Zones” panel.
Font... Invoke the “Font” panel.
1.5.4 General Attributes

The “General Attributes” panel allow to define attributes like marker type, marker size, line type or color definition for the low level graphics primitives like the lines, the markers the boxes etc...

① This menu choice allow to define the current marker type used.

② This scale allow to change the marker scale factor.

③ This menu choice allow to define the current line style used.

④ This push button open the “Define Color” panel (see after).

① By default the “automatic refresh” is on and as soon as an attribute is changed, the current picture is updated with the new attribute value. But when the “automatic refresh” is off, this button becomes active a should pressed in order to update the current picture with the new attribute value.

② This push button allow to reset the default value of all the attributes manageable in this panel.

③ Close this panel.
Define Color

This panel is invoked when the button number ③ is pressed in the “General Attributes” panel. This panel allows to define a color in RGB or HLS modes.
1.5. The Histogram Style Panel

1. Percentage of Blue in the color define by the Current Color index.
2. Percentage of Blue in the color define by the Current Color index.
3. Percentage of Blue in the color define by the Current Color index.
4. Light.
5. Saturation
6. Hue.
7. Hue scale.
8. Maximum number of colors.
9. Colors index to be changed.

1. Apply the changes.
2. Define the color.
3. Reset the color.
4. Reset.
5. Close the panel
1.5.5 Object Attributes

The “Object Attributes” panel allows to define the graphics attributes of the H PLOT objects managed by PAW such as: Histograms, Axis etc... On the left part of this panel the type of object can be define via a list of toggle buttons. For example here “Histogram” is selected: all the attributes definable in the panel will be apply on the histograms (histogram color, histogram line width etc...).

The zones affected by the buttons ① to ⑥, are shown on the next figure.
Apply the changes if the “automatic refresh” is not on.
2. Change the title of the selected object.
3. Reset all the attributes.
4. Close this panel
5. Change the line width of the selected object.
6. Reset the attributes of the selected object.
7. Invoke the “Object Colors” panel.
8. Invoke the “Object Hatch Style” panel.
Object Hatch Style

Distance Between each hatch

Angle Between 90 and 180 degrees

Angle Between 0 and 90 degrees

Index:

Apply  Reset  Close

① ② ③ ④
Object Colors

1. Surface
2. Contour
3. Statistic box shadow
4. Zone box shadow

Color Index:

Apply
Reset
Close
1.5.6 Geometry

![Geometry Settings Diagram]

- HBOOK GLOBAL TITLE
- ID: 2
- Entries: 5000
- Mean: 0.4982
- RMS: 0.2205

Example of title along YVAL, XVAL, XTI, YTI, BARW, BARO, and other settings.
1.5.7 Viewing Angles
1.5.8 Axis Scaling

Diagram showing the axis scaling interface with labeled components:

1. Y Axis:
   - First Bin
   - Last Bin
   - Number of Bins: 100
   - Lock
   - Minimum
   - Maximum
   - Apply

2. X Axis:
   - First Bin
   - Last Bin
   - Number of Bins: 100
   - Lock
   - Rebin Factor
   - Reset
   - Close

Legend:

- 1: ...  
- 2: ...  
- 3: ...  
- 4: ...  
- 5: ...  
- 6: ...  
- 7: ...
1.5.9 Zones
1.5.10 Axis Settings

- **X Axis**
- **Y Axis**
- **Z Axis**

- **Grid**
- **Ticks**
- **Logarithmic**

- **No Optimization**

- **Number of Primary Divisions**
  - 10

- **Number of Secondary Divisions**
  - 5

- **Number of Tertiary Divisions**
  - 1

- **Labels...**
- **Orientation...**

- **Apply**
- **Reset**
- **Close**
1.5. The Histogram Style Panel

1 ...
2 ...
3 ...
4 ...
5 ...
6 ...
7 ...
8 ...
9 ...
Axis Labels

Numeric

Alphanumeric Labels:

JAN FEV MAR APR

AAA BBB CC

...
1.5. The Histogram Style Panel

1 ... 
2 ... 
3 ... 
4 ...
Label Orientation

1. ...  
2. ...
1.5. The Histogram Style Panel

1.5.11 Font

[Diagram of Font Settings panel with labels 1, 2, 3, 4 indicating different sections or elements]
1.5.12 Plot Options

<table>
<thead>
<tr>
<th>Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Default</td>
</tr>
<tr>
<td>Line</td>
<td>Line</td>
</tr>
<tr>
<td>Smooth Curve</td>
<td>Smooth Curve</td>
</tr>
<tr>
<td>Bar Chart</td>
<td>Bar Chart</td>
</tr>
<tr>
<td>Star</td>
<td>Star</td>
</tr>
<tr>
<td>Error Bars</td>
<td>Error Bars</td>
</tr>
<tr>
<td>Error Bars (lines)</td>
<td>Error Bars (lines)</td>
</tr>
<tr>
<td>Error Rectangles</td>
<td>Error Rectangles</td>
</tr>
<tr>
<td>Error: Filled Area</td>
<td>Error: Filled Area</td>
</tr>
<tr>
<td>Error: Smoothed Area</td>
<td>Error: Smoothed Area</td>
</tr>
<tr>
<td>Hidden Lines Surface</td>
<td>Hidden Lines Surface</td>
</tr>
<tr>
<td>Color Level Surface (1)</td>
<td>Color Level Surface (1)</td>
</tr>
<tr>
<td>Color Level Surface (2)</td>
<td>Color Level Surface (2)</td>
</tr>
<tr>
<td>Hidden Lines Lego</td>
<td>Hidden Lines Lego</td>
</tr>
<tr>
<td>Filled Lego</td>
<td>Filled Lego</td>
</tr>
<tr>
<td>Color Level Lego</td>
<td>Color Level Lego</td>
</tr>
</tbody>
</table>
1.5.13 Coordinate Systems

**Cartesian**

**Polar**

**Cylindrical**

**Spherical**

**Pseudo Rapidity**
1.6 Ntuple Viewer

1.6 Ntuple Viewer

- 📌 CATEGORY
- 📌 FLAG
- 📌 AGE
- 📌 SERVICE
- 📌 CHILDREN
- 📌 GRADE
- 📌 STEP
- 📌 HRWEEK
- 📌 COST
- 📌 DIVISION
- 📌 NATION

- 📌 Cut Editor...
- 📌 Define Histogram...
- 📌 Ignore Cuts
- 📌 Overlay
- 📌 Plot
- 📌 Scan
- 📌 Project
- 📌 Loop...
- 📌 Refresh...

- 📌 First Row
- 📌 Number of Rows
- 📌 Histogram ID

- 📌 Close
- 📌 Help...
Chapter 1. PAW++: A guided tour

(1) Field showing the current directory and the name of the Ntuple.
(2) The names of the variables defined for the Ntuple. If you double click on one of the variable names a histogram showing the values of the variable will be plotted.
(3) The X, Y and Z fields allow you to define which variables will be used by the Plot and Scan buttons. These fields can be filled in two ways: firstly by typing the name or an expression of a variable; secondly by double-clicking in one of the X, Y or Z fields. In the latter case the field pointed at is filled with the variable highlighted in the list of variables.
(4) Defines the first row used in the Ntuple when the Plot or Project buttons are pressed.
(5) Defines the number of rows used (starting from First Row) when the Plot or Project buttons are pressed.
(6) Defines the histogram identifier used when the Plot or Project buttons are pressed.
(7) Fields showing the number of rows and columns in the Ntuple.

1 Close the Ntuple Viewer.
2 Invoke the Cut Editor (see ...).
3 Produce a plot using all the indications specified on the Ntuple Viewer panel.
4 Call the Ntuple Scanner (see ...).
5 A toggle button allowing you to enable/disable the cuts defined with the Cut Editor.
6 A toggle button, which, when pressed will produce the next plot on top of an already existing one, i.e. without clearing the graphics window.
7 Project the selected variables in the histogram specify in (5).
8 Help on the Ntuple Viewer.
1.7 The Cut Editor

1.7.1 The Cut Editor Menu Bar

File

Open...
Save Cuts
Save Cuts As...
Close
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Edit

Add Cut Before
Add Cut After
Add ( Before
Add ( After
Add ) Before
Add ) After
Delete Item
Delete All Items

Options

Show Tree...
Dynamic Mode...
Indentation...
Activate All Cuts
De-activate All Cuts
1.8. KUIP/Motif Panel Interface

1.7.2 Ntuple Scanner

The PANEL Interface allows to define command sequences which are executed when the corresponding button is pressed (like STYLE GP in PAW/X11). The command sequence

```
PANEL 0
PANEL 4.06 'some string'
PANEL 0 D 'This is my first panel' 500x300+500+600
```

creates a panel with 4 rows and 6 columns of buttons. The text 'some string' should be long enough to fit the longest command Sequence which should be put onto one of the buttons. The 'PANEL 0 D' command defines the title and the window size and coordinates in the form WxH+X+Y.

The panels can be edited interactively:
- Clicking with the right mouse button on an empty panel button the user will be asked to give a definition to this button.
- Clicking with the left mouse button on a panel button removes its definition.

The PANEL commands needed to recreate a panel can be saved into a macro file by pressing the “Save Panel” button. Panels can be reloaded either by executing the command 'PANEL 0 D' or by pressing the “Command Panel” button in the “View” menu of the Executive Window and entering the corresponding file name.
Appendix A: X Window resources

A.1 X resources for PAW++

This is a list of the X resources available to PAW++. Resources control the appearance and behavior of an application.

Users can specify their own values for these resources in the standard X11/Motif way (via their own .Xdefaults file or the system wide /usr/lib/X11/app-defaults/Paw++ file).

Any default values specified by PAW++ are given behind the resource name.

Paw++*background:

Specify the background color for all windows.

Paw++*foreground:

Specify the foreground color for all windows.

Paw++*kxtermGeometry: 550x550+5+10

Geometry of Kxterm, the KUIP terminal emulator (PAW++ Executive Window).

Paw++*kuipGraphics_shell.geometry: 550x550+585+10

Geometry of the Graphics Window(s) (if any).

Paw++*kuipBrowser_shell.geometry: 495x511+161+481

Geometry of the Browser(s).

Paw++*histoStyle_shell.geometry: 599x360+668+631

Geometry of the Style Panel.

Paw++*ntupleBrowser_shell.geometry:

Geometry of the Ntuple Viewer.

Paw++*XmTextField*fontList: "-prestige-medium-r-normal-*120-*"
Paw++*XmText*fontList: "-prestige-medium-r-normal-*120-*"

Font used by all text areas.

Paw++*kxtermFont: "-prestige-medium-r-normal-*120-*"

Font used by Kxterm (PAW++ Executive Window)

Paw++*dirlist*fontList: "-courier-bold-r-normal*-120-*"
A.1. X resources for PAW++

Font used for the icon labels in the browser.

\[\text{Paw++\text*fontList: } */-\text{courier-}\text{medium-}\text{r-}\text{normal}*-120-\text{-}]*\]

Font used for the Ntuple/Scan matrix (accessible via the Ntuple Viewer).

\[\text{Paw++\text*helpFont: } */-\text{courier-}\text{bold-}\text{r-}\text{normal}*-120-\text{-}]*\]

Font used for help windows.

\[\text{Paw++\text*fontList: } */-\text{swiss*-742-bold-}\text{r-}\text{normal}*-120-\text{-}]*\]

Font for the menus, messages and boxes.

\[\text{Paw++\text*keyba}\text{rdFocusPolicy: } \text{pointer}\]

If “explicit” focus is determined by a mouse or keyboard command. If “pointer” (default), focus is determined by the mouse pointer position.

\[\text{Paw++\text*doubleClickInterval: } 400\]

The time span (in milliseconds) within which two button clicks must occur to be considered a double click rather than two single clicks.

\[\text{Paw++\text*dirlist*background: }\]

Specify the background color for the iconbox part of the browser.

\[\text{Paw++\text*dirlist*<object>*iconForeground: }\]

Specify the foreground color for the icons of type <object>.

\[\text{Paw++\text*dirlist*<object>*iconBackgroundColor: }\]

Specify the background color for the icons of type <object>.

\[\text{Paw++\text*dirlist*<object>*iconLabelForeground: } \text{black}\]

Specify the foreground color for the labels of the icons of type <object>.

\[\text{Paw++\text*dirlist*<object>*iconLabelBackgroundColor: } \text{white}\]

Specify the background color for the labels of the icons of type <object>. Currently the following different <object>'s are defined:
AppenR A. X Window resources

dir  -- directory
1d  -- 1d histograms
2d  -- 2d histograms
ntuple -- Ntuples
pict -- Higz pictures
chain -- Ntuple chains
entry -- Ntuple chain entries
hbook -- Hbook files

The default iconForeground and iconBackground colors for these objects are:

- Paw++/dirlist/*dir*iconForeground/: blue
- Paw++/dirlist/*1d*iconForeground/: DarkGoldenrod3
- Paw++/dirlist/*2d*iconForeground/: DeepPink3
- Paw++/dirlist/*ntuple*iconForeground/: SteelBlue3
- Paw++/dirlist/*pict*iconForeground/: green4
- Paw++/dirlist/*chain*iconForeground/: blue
- Paw++/dirlist/*entry*iconForeground/: OrangeRed

When using a black and white X Server use the following resource settings to make the icons visible:

- Paw++/dirlist/*<object>*iconForeground/: black
- Paw++/dirlist/*<object>*iconBackground/: white
- Paw++/dirlist/*<object>*iconLabelBackground/: black
- Paw++/dirlist/*<object>*iconLabelForeground/: white

A.2 X resources for for KUIP/Motif

This is a list of the X resources available to any KUIP/Motif based application (e.g. PAW++). Resources control the appearance and behavior of an application.

Users can specify their own values for these resources in the standard X11/Motif way (via the .Xdefaults file or a file in the /usr/lib/X11/app-defaults directory). One just has to prefix the desired resource by the class name of the application.

To customize PAW++, for instance, all the resources have to be prefixed with Paw++ or they should be stored in the file /usr/lib/X11/app-defaults/Paw++.

Any default values specified by KUIP are given behind the resource name.

*background:

Specify the background color for all windows.

*foreground:

Specify the foreground color for all windows.

*kxtermGeometry: 550x550+5+10

A.2. X resources for KUIP/Motif

Geometry of Kxterm, the KUIP terminal emulator (Executive Window).

*kuipGraphics_shell.geometry: 550x550+585+10

Geometry of the graphics window(s) (if any).

*kuipBrowser_shell.geometry: 580x450

Geometry of the browser(s).

*XmText*fontList: -helvetica-bold-r-normal*-120-*
*XmTextField*fontList: -helvetica-bold-r-normal*-120-*

Font used by all text areas.

*kxtermFont:

Font used by Kxterm (PAW++ Executive Window)

*dirlist*fontList:

Font used for the icon labels in the browser.

*helpFont: -courier-bold-r-normal*-120-*

Font used for help windows.

*fontList: -helvetica-bold-r-normal*-120-*

Font for the menus, messages and boxes.

*keyboardFocusPolicy: explicit

If “explicit” (default), focus is determined by a mouse or keyboard command. If “pointer” focus is determined by the mouse pointer position.

*doubleClickInterval: 250

The time span (in milliseconds) within which two button clicks must occur to be considered a double click rather than two single clicks.

*dirlist*background:

Specify the background color for the iconbox part of the browser.

*dirlist<&object>*iconForeground: black

Specify the foreground color for the icons of type <object>.
Appendix A. X Window resources

*dirlist*<object>*iconBackground: white

Specify the background color for the icons of type <object>.

*dirlist*<object>*iconLabelForeground: black

Specify the foreground color for the labels of the icons of type <object>.

*dirlist*<object>*iconLabelBackground: white

Specify the background color for the labels of the icons of type <object>.

*zoomEffect: True

Turn zoom effect on or off when going up and down directories in the browser.

*zoomSpeed: 10

Specify speed of zoom effect in the browser.

Currently the following different <object>'s are defined:

Cmd -- Command
InvCmd -- Deactivated command
Menu -- Menu tree
MacFile -- Macro File
RwFile -- Read-write file
RoFile -- Readonly file
NoFile -- No access file
ExFile -- Executable file
DirFile -- Directory
DirUpFile -- Up directory (..)

When using a black and white X Server use the following resource settings to make the icons visible:

*dirlist*<object>*iconForeground: black
*dirlist*<object>*iconBackground: white
*dirlist*<object>*iconLabelBackground: black
*dirlist*<object>*iconLabelForeground: white
Appendix B: Editing keys in the Input Pad

"C-b" means holding down the Control key and pressing the b key. "M-" stands for the Meta key and "A-" for the Alt key.

C-b: backward character
A-b: backward word
M-b: backward word
Shift A-b: backward word, extend selection
Shift M-b: backward word, extend selection
A-[[: backward paragraph
M-[: backward paragraph
Shift A-[[: backward paragraph, extend selection
Shift M-[[: backward paragraph, extend selection
A-<[: beginning of file
M-<[: beginning of file
C-a[: beginning of line
Shift C-a[: beginning of line, extend selection
C-osfInsert: copy to clipboard
Shift osfDelete: cut to clipboard
Shift osfInsert: paste from clipboard
Alt->: end of file
M->: end of file
C-e[: end of line
Shift C-e[: end of line, extend selection
C-f: forward character
A-[: forward paragraph
M-[: forward paragraph
Shift A-[[: forward paragraph, extend selection
Shift M-[[: forward paragraph, extend selection
C-A-f: forward word
C-M-f: forward word
C-d: kill next character
A-BS: kill previous word
M-BS: kill previous word
C-w: kill region
C-y: yank back last thing killed
C-k: kill to end of line
C-u: kill line
A-DEL: kill to start of line
M-DEL: kill to start of line
C-o: newline and backup
C-j: newline and indent
C-n: get next command, in hold mode: next line
C-osfLeft: page left
C-osfRight: page right
C-p: get previous command, in hold mode: previous line
C-g: process cancel
C-l: redraw display
C-osfDown: next page
C-osfUp: previous page
C-SPC: set mark here
C-c: send kill signal to application
C-h: toggle hold button of pad containing input focus
F8: re-execute last executed command
Shift F8: put last executed command in input pad
Shift-TAB: change input focus
Appendix C: The Motif user interface tools

C.1 Scale
C.2 Buttons

C.2.1 Toggle Buttons

C.2.2 motifpush

C.2.3 Selection Buttons
Appendix C. The Motif user interface tools

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C.4 Mwm Window Decoration
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