

GEMINI

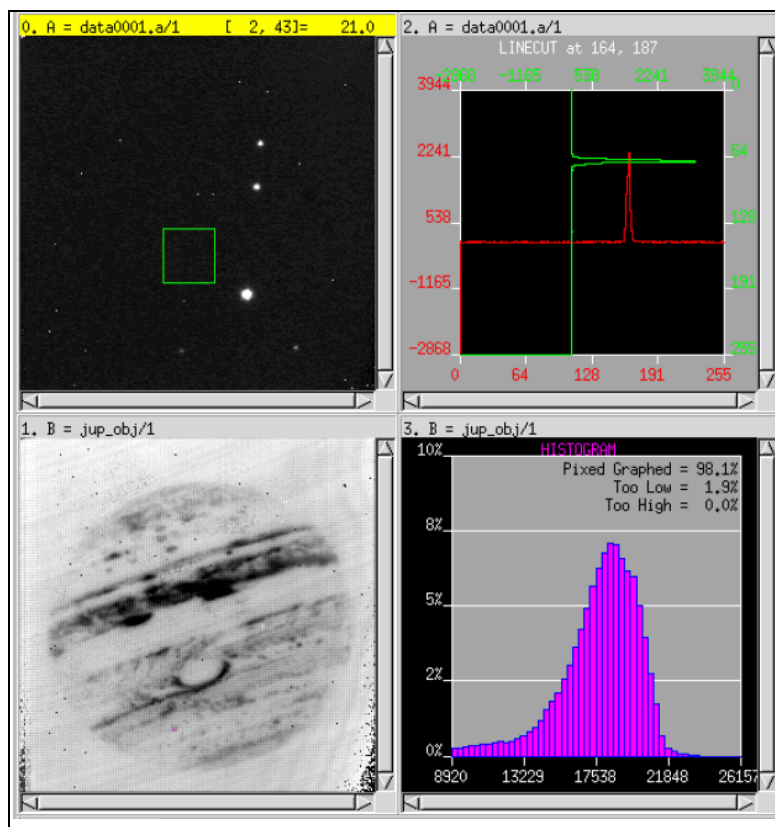
NEAR INFRARED CORONAGRAPHIC IMAGER

NICI

USER MANUAL ADDENDUM

DATA VIEWER (DV) DESCRIPTION

REVISION 0.2
(PRELIMINARY)
9/28/04



Revision History

Revision	Author	Summary of revisions	Date
0.2	Mike Thompson	Preparing for initial customer release. This version contains open issues. Version 0.2_PRELIM will be scrubbed of issues for initial release.	10/27/04
0.1	Mike Thompson	Initial revision. Prepared from 12/10/99 version, adapted to be NICI specific. Need to resolve some questions and check the document against the NICI DV software.	9/28/04

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1 Introduction to DV

The Data Viewer (DV) software is a tool used to view FITS data files. DV is an X Windows application written using the GTK+ toolkit.

DV was developed by Tony Denault at the NASA Infrared Telescope Facility, and is used as the facilities instrumentation FITS data viewer. The source code and documentation is publicly available at the links listed below. This description is adapted from the publicly available on-line documentation.

DV Homepage: <http://irtfweb.ifa.hawaii.edu/Facility/DV/dv.html>

DV Download: <http://irtfweb.ifa.hawaii.edu/~denault/download/index.html>

The following is a brief summary of DV's capabilities.

- Manipulates FITS images of up to 2048 by 2048 pixels using double float numeric types.
- Provides up to 8 buffers and 5 (or 7, or 9) canvases for holding and viewing data.
- Provides 8 graphical display formats:
 - Image
 - FITS header
 - Histogram
 - Line cut
 - X line cut
 - Pointer
 - Noise
 - Stats
- Performs various arithmetic operations on the FITS data.
- Provides tools to calculate and view statistics on pixels.
- Produces postscript files of graphics for hardcopy output.
- Accepts data and commands from other applications using sockets.

The following provides a brief overview of the sections in this document.

Section 2 Running DV explains DV setup and starting the program.

Section 3 Introduction to DV describes the process of reading files into DV buffers and saving buffers to files. It also describes the macro capabilities of DV.

Section 4 The Canvas describes the DV canvasses, the windows in which images and data are displayed.

Section 5 The Main Panel describes the heart of DV's functionality. This section explains how to control and configure the display of data and DV configuration.

Section 6 DV Command Dictionary provides a definition of all of the command line commands available through DV.

Most of this discussion refers to operations performed through the GUI. All of these operations, however, may be performed with commands issued at the command line.

2 Running DV

This section covers DV setup information and describes how to start DV.

2.1 DV Setup

The DV application is installed in the /user/local/dv directory on the nici_ic server.

Setting the environment variable \$DVHOME:

Create an environment variable \$DVHOME which points to the directory where the application is stored. On the nici_ic server a csh user would type the following.

```
%> setenv DVHOME /user/local/dv
```

Startup configuration file, .dv-init:

This step is optional, but highly recommended. When DV starts up, it searches for an initialization file called ".dv-init" in the user's home directory. If this file exists, DV expects it to contain DV commands. See the DV Command Dictionary in Section 6 for the syntax of the commands. Using a text editor users can place instructions in this file to configure DV when it starts up. For example, the file may contain the following instructions to setup the directory paths and printer name. Users may also like to associate macros with macro buttons in their startup file.

```
Path $HOME/data
m.path $HOME/macro/dv
m.filemask *
printer laserprinter1
```

2.2 Starting DV

The DV program is an X windows application. The user should be running an X server in order to use DV.

To start DV from an xterm or shell tool window, type 'dv' in the window.

```
unix%> dv &
```

Command Line Arguments:

DV can run on both 8-bit Pseudo Color and True Color (24 or 32 bits) displays. DV will try to execute using 8-bit pseudo color, then try true color. Sometimes DV is unable distinguish which modes are supported by the X Server and won't start. The following command line options can force DV to run in a particulate mode:

- P Pseudo Color. This option tells DV to run using the Pseudo Color Display mode. (This is the default)
- T True Color. Tells DV to run using the True Color Display mode. For example, this command forces DV to run in true color mode: unix% dv -T
- f fontName Specifies the default font. DV will attempt to use the named font as its default font. In this example, DV will use the 7x14 font: unix% dv -f '7x14'
- m Medium DV option – This option will cause DV to start with 7 canvases: 6 on the main window, 1-floating display. The default is 5 canvases: 4 on the main window, 1-floating display.
- l Large DV option – This option will cause DV to start with 9 canvases: 8 on the main window, 1 floating display. The default is 5 canvases: 4 on the main window, 1 floating display.

Sometimes the following message may appear in the console window.

Run DV without Sockets? (y or n) <CR>):

If running DV with the instrumentation software, users must run DV with sockets. Otherwise the user may run DV without sockets. When DV starts it tries to establish a socket to allow data and commands to be sent to it from the instrumentation program. This message can appear because:

1) DV is already running on the machine. Use or close the current instance or run DV from another machine.

2) The operating system has not cleared the socket that a previous DV instance was using. If the program was just exited, it will take the operating system a few minutes to destroy the socket. During this period, one cannot establish another DV socket. Just wait 30 seconds and try again. (And maybe again).

3 The Base Window

When DV starts, a window called the Base Window appears on the screen. Figure 1 is an illustration of the Base Window. The base window consists of the Menu Bar, 4 Viewing Canvases, a Main Panel with a set of tabs to access DV's variety of parameters and functions, a command line, and the Feedback Line. More canvases may be displayed if DV was started with the Medium or Large command line options.

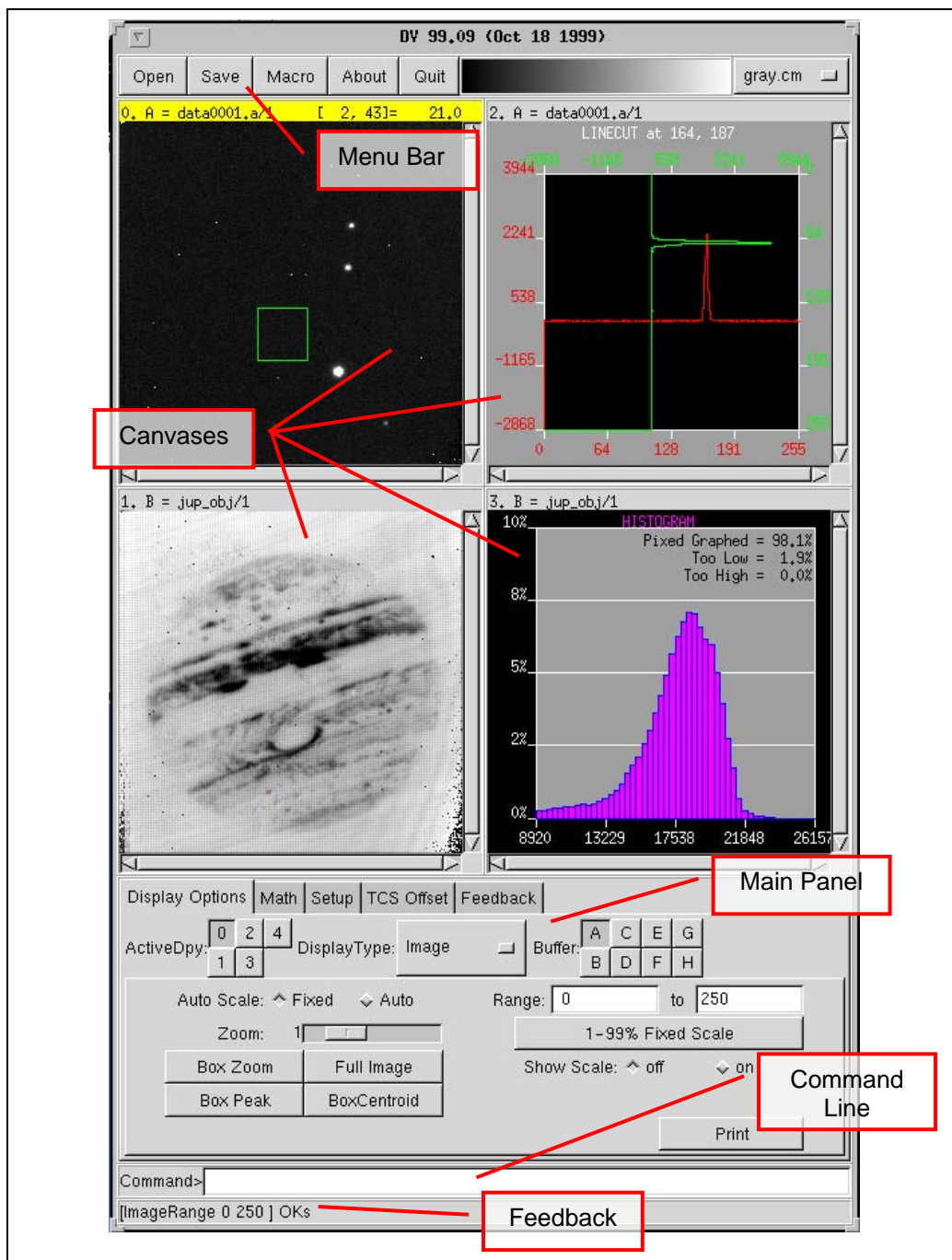


Figure 1 The Base Window

The Menu Bar:

At the top of the Base Window is the Menu Bar, pictured below in Figure 2.



Figure 2 The Base Window's Menu Bar

The following is a description of the Menu Bar buttons and features.

- **Open** – Displays the Open File dialog box for opening image files and reading them into buffers.
- **Save** – Displays the Save File As dialog box.
- **Macro** – Displays the Macro Dialog Box
- **Quit** – Quits DV.
- **Color Map Canvas** – Shows the current color map in use.
- **Color Map Drop-down Menu** – Provides a list of available color maps, which are stored in the \$DVHOME directory.

The Canvases:

By default four Canvases are located in the Base Window with horizontal and vertical scrollbars. They are used to display the data stored in DV's data buffers. A detailed description of the Canvases can be found in Section 4. For starting DV with additional canvases, see Section 2.2.

The Main Panel:

The Main Panel is used to set most options dealing with the image display and manipulation and has several different views (tabs) which are detailed in Section 5. Some DV configuration can also be set through the Main Panel.

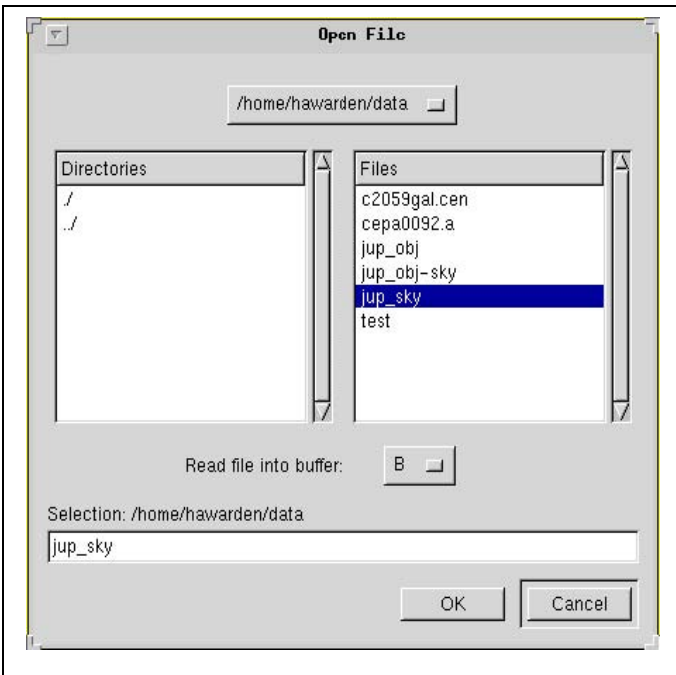
The Command Line:

The Command Line is used to enter commands manually. A library of commands can be found in Section 6.

The Feedback Line:

The most recent command feedback or error generated by DV is displayed here. More details on the Feedback Line, such as the color coding, can be found in the Main Panel description, Section 5.5.

3.1 The Open File Dialog Box - Reading into Buffers



Selecting the Open button on the menu bar causes the Open File dialog box to appear on the screen. This dialog box enables a user to read data files into the data buffers.

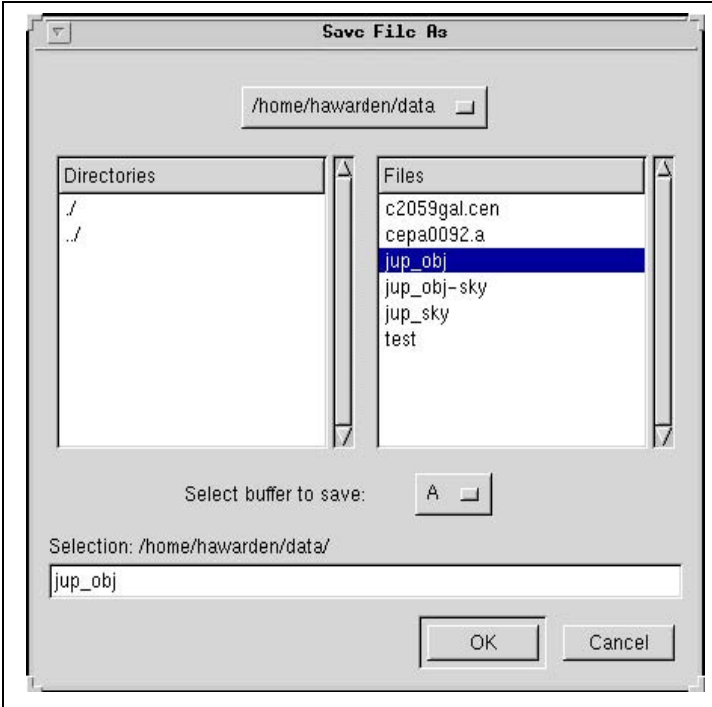
There are two lists on this window. On the right is the file list, which lists all the files in the Path. Select the filename with the mouse to identify the file which is to be read. On the left is the directory list. The directory list displays the name of the directory in the current path. Using the mouse double clicking on these names changes the Path.

Figure 3 Screenshot of the Open File Dialog Box

- **Directory Option Menu** – This option menu at the top of the dialog box displays the path from the root directory down to the current directory.
- **Read file into buffer** – The selected file will be read into the buffer indicated in this drop down menu when OK is clicked.
- **Selection** – This text entry line allows users to type in the path and/or the filename of the file to read from.
- **OK** – Selecting this button will cause the selected file to be read into the selected Buffer.
- **Cancel** – Selecting this button hides the dialog box without reading into any buffer.

3.2 The Save File As Dialog Box - Saving Buffers

Clicking the Save button on the menu bar will cause the Save File As dialog box to appear on the screen. This dialog box enables users to write the data from a buffer to a file.



There are two lists on this window. On the right is the file list, which lists all the files in the current directory. Users may select the filename with the mouse to identify the file to save the buffer. On the left is the directory list. The directory list displays the name of the directory in the current path. Double click on these names changes the Path.

Figure 4 Screenshot of the Save File As Dialog Box

- **Directory Option Menu** – This option menu at the top of the dialog box displays the path from the root directory down to the current directory.
- **Buffer** – Data from the buffer identified by this drop down menu will be saved to the selected file when OK is clicked.
- **Selection**– This text entry line allows users to type in the path and/or the filename of the file to save to.
- **OK** – Clicking this button will save the selected buffer to the selected file. If the file already exists, it will be overwritten. If the file does not exist, a new file will be created.
- **Cancel** – Selecting this button hides the dialog box without saving.

3.3 The Macro Dialog Box

DV provides a way of creating and executing Macro files. In the Base Window Menu Bar, clicking the Macro button brings up the Macro Dialog Box which allows users to create, edit, and execute macro files. This dialog box contains a text display window, a file list window, and a group of panel items as shown in Figure 5. Macros files in the current directory are displayed in a list on the left below the Path field. The contents of the currently selected macro are displayed on the right below the Path field.

A macro file is a text file containing DV commands. There should be one command per line and the syntax for the commands is defined in the DV Command Dictionary in Section 6. Macro files must be named with a ".mac" extension.

To execute a macro file, select the file in the list and then click the Execute button. DV will read the file and execute each line. The commands and their error messages will be written to the Feedback Tab. When macro file has successfully finished executing, "Macro execution Finished" will be printed in the Feedback Tab. To abort a macro file in progress, click on the Stop button.

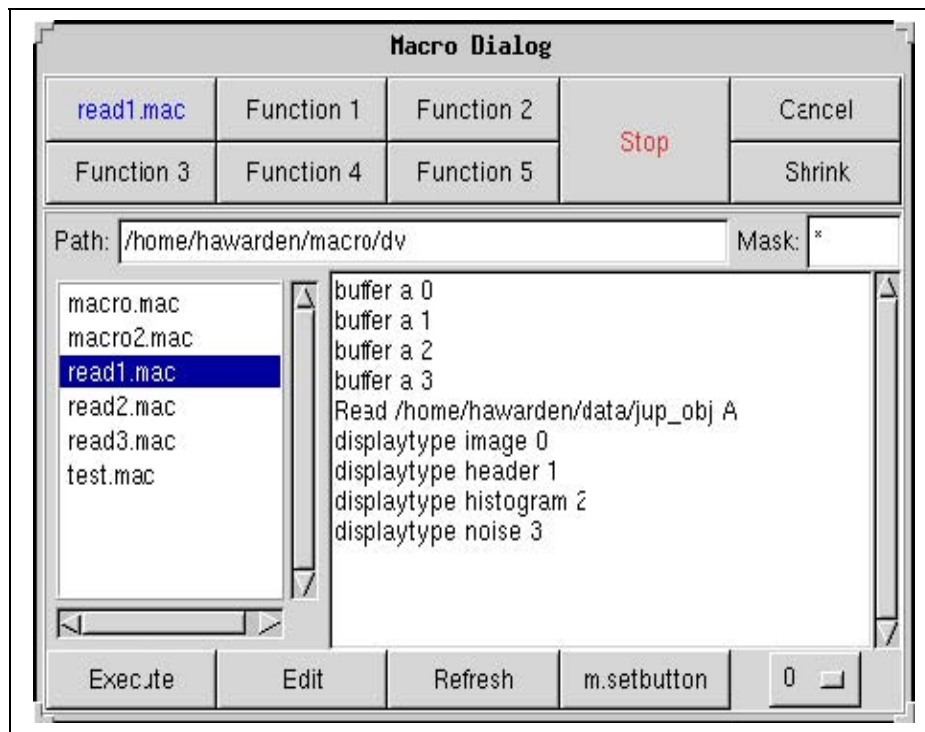


Figure 5 Screenshot of the Macro Dialog Box

The following items in the Macro Dialog Box provide means for manipulating and executing macro files.

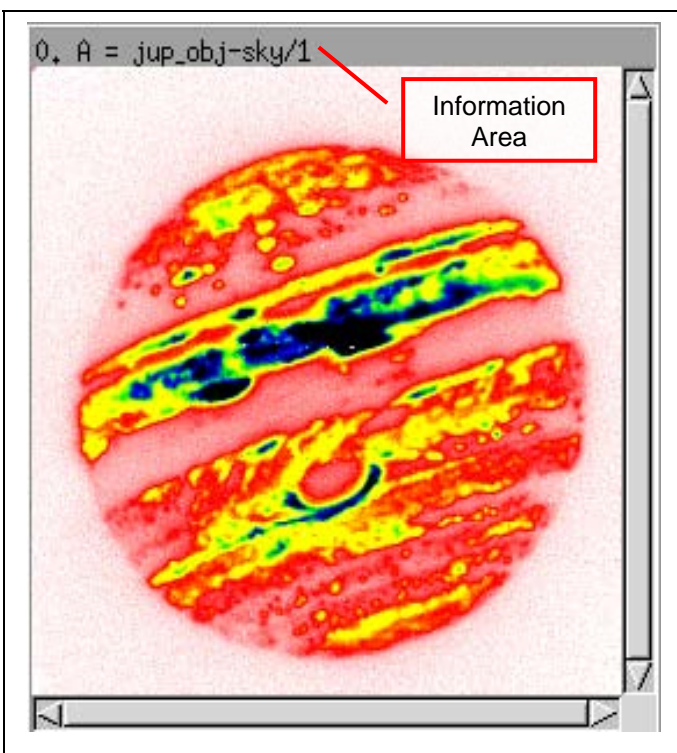
- **Six Function Buttons** – These six Function Buttons can be associated with macro files. After the button has been linked to a macro file, clicking the button executes the macro. The name of the associated file is displayed on the button.
- **Stop** – Clicking this button stops the currently executing macro.
- **Cancel** – This button closes the Macro Dialog Box.
- **Shrink/Expand** – This button hides or shows the lower part of the dialog box.
- **Path** – This text field specifies the directory where macro files are stored. Macros in this directory are displayed in the file list below the Path text field.

- **Mask** – The mask is a regular expression used with the path to filter the names of the files displayed in the file list.
- **Execute** – Clicking this button executes the currently selected macro.
- **Edit** – This button opens the selected file using the word processor 'NEdit'. The file can then be edited, saved, etc. Of course the macros can be edited with any text editor externally.
- **Refresh** – This button updates the macro file list.
- **m.setbutton** – Use the option menu next to this button to select the number of the button to associate with the currently selected macro file. Clicking the m.setbutton associates the macro with the button number. When a file has been associated with a button, the name of the file is displayed on the button.

4 The Canvas

The canvases are used to display the data. By default there are 5 canvases identified by the numbers 0, 1, 2, 3 and 4. Canvases 0 to 3 are 256 by 256 pixels in size and are located on the base window. Canvas 4 is located in a floating window which can be re-sized. To bring up Canvas 4, select its button in the 'Display Options' Tab. A command line option can start DV with 7 or 9 canvases, the last of which is a floating window which can be resized. See Section 2.2 Starting DV for details. An example of a canvas is shown in Figure 6.

The **Canvas** is used to show a representation of the data according to the display parameters set by the command line or through the Main Panel Display Options Tab (see Section 5.1). Each canvas is associated with one of 8 data buffers in the Main Panel. In addition the canvas can capture mouse and keyboard events which can affect the display. See Figure 7 for a description of the types of events and associated actions.



The **information area** shows some textual information about the data. The left hand side shows the buffer, the filename, and the divisor variable. For example, "B = jup_obj-sky / 6" means this canvas is displaying the data in Buffer B, which contains the file "jup_obj-sky", and that the data is represented at 1/6 of its true value. On the right side, additional information about the data or display is shown. This information depends on the display type and is described in Figure 7.

The **vertical and horizontal scrollbars** allow users to scroll the display if the image is larger than the canvas. Only the image and header display types can be scrolled. All other display types are scaled to the size of the canvas.

Selecting a section of the canvas is done by middle-clicking and dragging the mouse as described in the table below to create an **Object Box**. Operations can be performed on the whole canvas or just the Object Box.

Figure 6 Screenshot of a Canvas

Image Canvas Event	Action
Cursor Movements	Display the x, y location and value of the pixel in the information area. The text is usually in black. However, if the pixel is bad and the bad pixel mask is on, the text is colored red.
Dragging the cursor and pressing the menu (right) mouse button	This causes the color map to be stretched and shifted. Vertical movements affect the stretch. Horizontal movements shift the color map.
Dragging the cursor and pressing the adjust (middle) mouse button	The dragging motion selects a group of pixels. These pixels are known as the Object Box .
Dragging the cursor, pressing the adjust (middle) mouse button & holding down the shift key	Draws a line from the starting pixel until the dragging motion is completed. The endpoints of this line are copied to the 'From' and 'To' prompts in the TCS coordinates Tab.
Pressing the select (left) mouse button	Center the Object Box at the cursor's x, y location.
Press "L" in the image display	If the current active canvas is displaying a linecut from the same buffer as the image, pressing 'L' will set a new X, Y axis for the line cut.

Figure 7 Table: Description of Canvas Events

5 The Main Panel

The main panel contains several pages, selectable by the tabs at the top of the main panel, that allow the user to change display options, carry out math operations on the buffer data as well as computing statistics on the data. There are five main panel Tabs: Display Options, Math, Setup, TCS Offset and the Feedback Tabs. The following sections describe the functionality of the Tabs available in the Main Panel.

5.1 The Display Options Tab

The Display Options Tab contains several panels that in turn contain buttons, prompts and menu items to control the display type and their options. For each canvas there is a Display Options panel as shown in Figure 8.

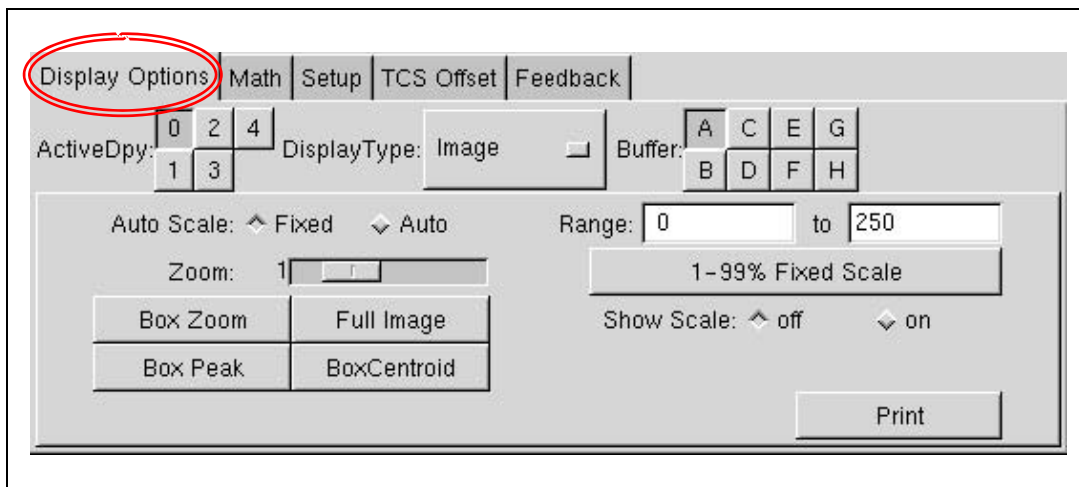


Figure 8 Screenshot of the Display Options Tab

The Display Options Tab is divided into two parts. The upper part contains some general options: buttons to select the active display, an option menu to choose the display type, and another set of buttons which allow the user to associate different buffers with each of the display canvases. This part of the Display Options Tab does not change for different Display Types.

- **Active Display Buttons (ActiveDpy)** – These buttons select the active canvas. The Display Type and Buffer panel items reflect the set up of the active canvas. Changing the values of any of the panel items only affects the active panel items.
- **DisplayType** – This option menu item selects the display type for the active canvas. The Display Types are described in the following sections. The display types are
 - Image
 - Header
 - Histogram
 - Linecut
 - XLinecut
 - Noise
 - Pointer
 - Stats
- **Buffer Buttons** – These buttons associate a data buffer, A - H, with the currently selected Active Display (canvas). Data is loaded into the buffers through the Open File Dialog Box.

The bottom part of the panel may change depending on the Display Type parameter. For each Display Type a different set of parameters is displayed. These panel items reflect the parameters of the current active canvas and display type. A description of the panel items for each display type is provided in the following sections.

5.1.1 Display Options Tab - Image Display Type

The Image Display Type is set when "Image" is selected in the Display Type drop down menu. The contents of the bottom part of the Display Options Tab are discussed in this section. The source data is from the selected Buffer and the image is displayed in the selected Active Display (Canvas).

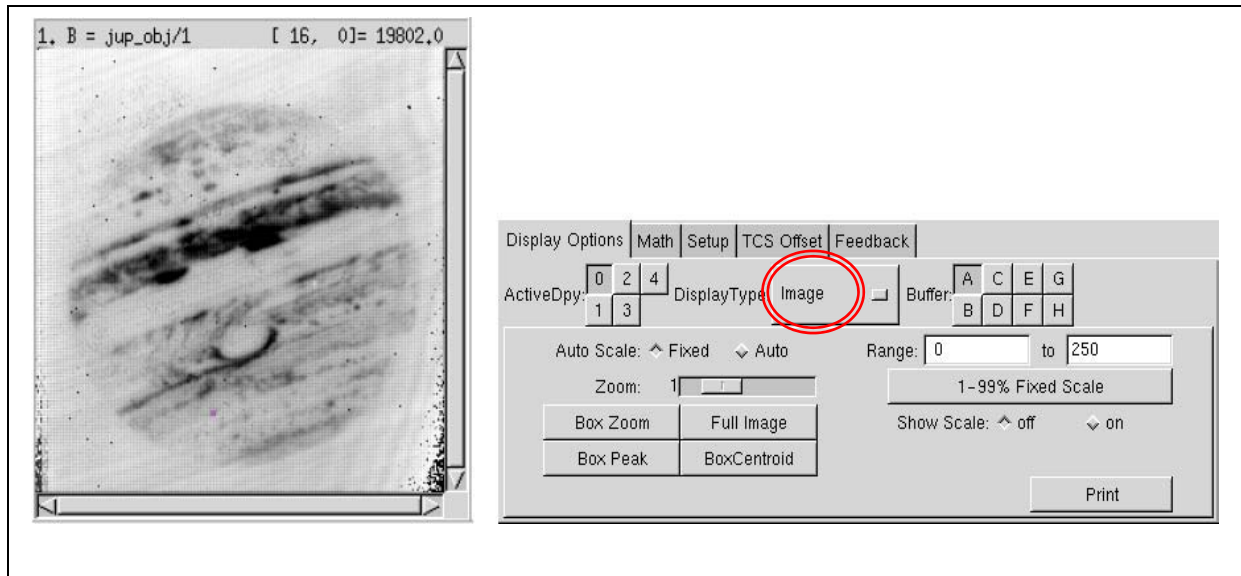


Figure 9 Screenshot of Image Display Type - Display Options and Canvas

- **Auto Scale** – The scale options are fixed or auto. When auto is selected the Image Range is automatically adjusted to the minimum and maximum values of the data displayed in the canvas. This adjustment occurs whenever the data in the buffer changes. For fixed scale, the program will never change the Image Range.
- **Zoom** – The zoom sets the zoom factor for the display. Adjust the scrollbar to the left (zoom out) or right (zoom in) to set the zoom to 1:1, 1:2, etc., data pixels per screen pixels.
- **Box Zoom** – This button sets the zoom and adjusts the scrollbars of the canvas so that the **Object Box** is centered in the canvas and all the pixels within the Object Box are displayed at the highest zoom level.
- **Full Image** – This button sets the zoom and adjusts the scrollbars of the canvas so that the entire image is centered in the canvas and all the pixels are displayed.
- **BoxPeak** – This issues the BoxPeak command, which shows the peak pixel inside the Object Box.
- **BoxCentroid** – This button issues the BoxCentroid command, which shows the Centroid position inside the Object Box.
- **Range** – The color of the pixels are determined by mapping the color map to the minimum and maximum values of the Image Range.
- **1-99% Fixed Scale** - This button will execute an algorithm that determines the minimum and maximum range values such that 98% of the pixels is included within the range. 1% percent of the pixels will be above the maximum, and 1% of the pixel will be below the minimum.
- **Show Scale** – Specifies whether an arcsecond scale is displayed along with the image. Note that the necessary information is also needed in the FITS header or else the scale cannot be displayed.
- **Print** – Click this button to get a hardcopy from the printer. The printer is configured as described in Sections 2.1 DV Setup and 5.3 The Setup Tab.

5.1.2 Display Options Tab - Header Display Type

The Header Display Type in the Display Options Tab shows the text of the FITS header for the data in the Active Canvas. There are no options available for this display type. The source data is from the selected Buffer and the Header information is displayed in the selected Active Display (Canvas).

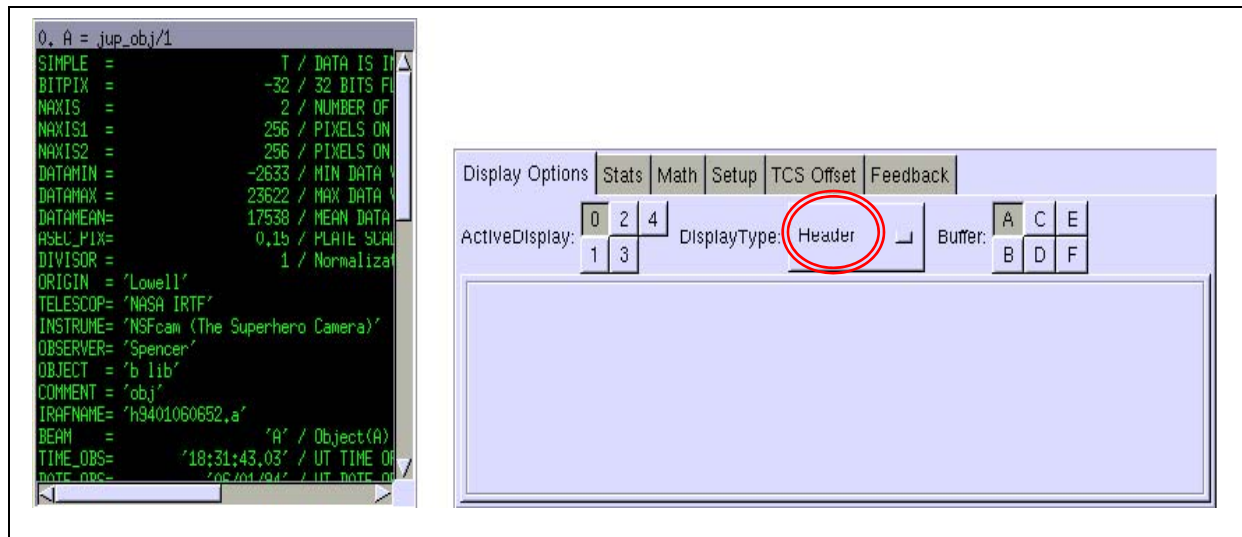


Figure 10 Screenshot of Header Display Type and Canvas

5.1.3 Display Options Tab - Histogram Display Type

The Histogram Display Type of the Display Options Tab draws a histogram of the pixels' data distribution as shown in Figure 11. The source data is from the selected Buffer and the histogram is displayed in the selected Active Display (Canvas).

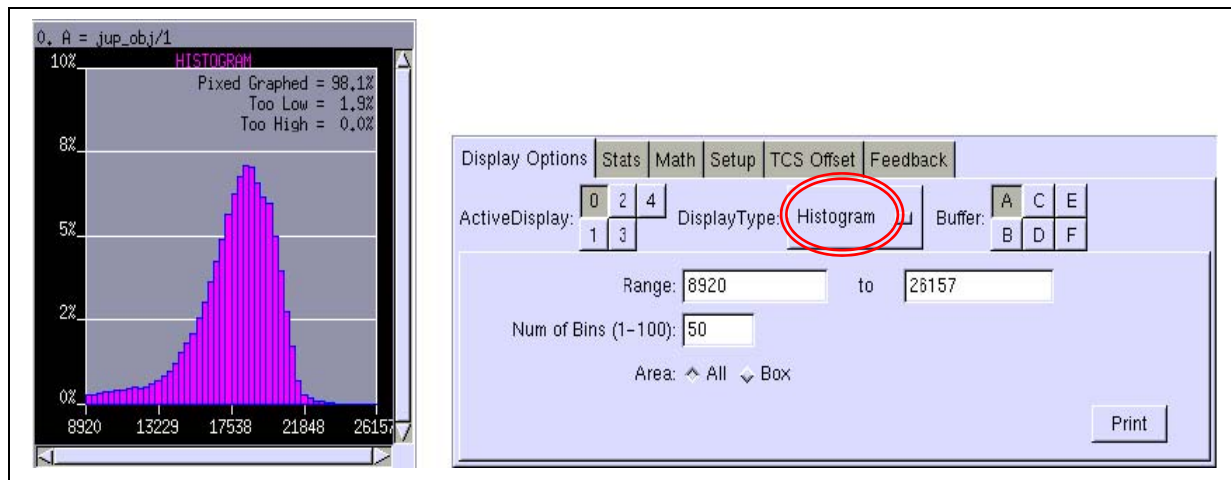


Figure 11 Screenshot of Histogram Display Type - Display Options and Canvas

The Histogram panel consists of the following panel items.

- **Range** – These values determine the minimum and maximum values of the X axis of the histogram, and will be the same as the range on the Image display panel. Changing the histogram range will change the image range and vice versa.
- **Num. of Bins** – Specifies the number of bars on the histogram. The size of the bin is determined by dividing the range by the number of bins.
- **Area** – These buttons specify whether the histogram is displayed for the entire image (All) or just the pixels in the Object Box (Box).
- **Print** – Select this button to print a hardcopy of the histogram. The printer is configured as described in Sections 2.1 DV Setup and 5.3 The Setup Tab.

5.1.4 Display Options Tab - LineCut Display Type

The Linecut Display Type will show a graph of the pixel values along the x and y axes in the Active Canvas. The source data is from the selected Buffer and the line cut graph is displayed in the selected Active Display (Canvas).

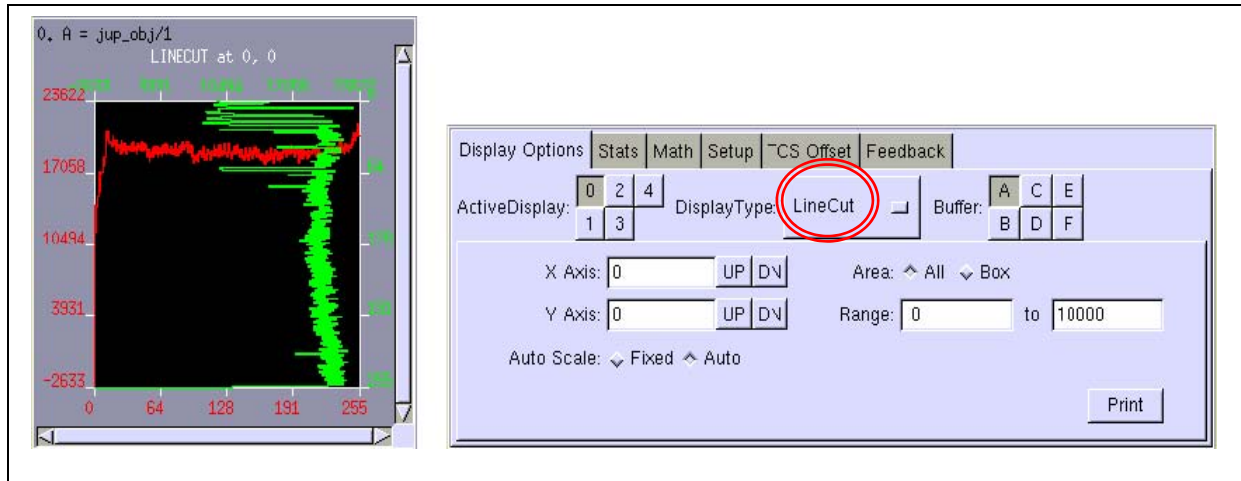


Figure 12 Screenshot of LineCut Display Type - Display Options and Canvas

The Linecut panel consists of the following panel items.

- **X Axis** – Identifies the position on the X axis in the active canvas used to draw the line cut. The UP and DN (down) buttons increment and decrement the value for the X axis cut.
- **Y Axis** – Identifies the position on the Y axis in the active canvas used to draw the line cut. The UP and DN (down) buttons increment and decrement the value for the Y axis cut.
- **Auto Scale** – This switch determines whether to autoscale the graph or use Range to determine the scale. The scale options are fixed or auto. When auto is selected the Image Range is automatically adjusted to the minimum and maximum values of the data displayed in the selected canvas or Object Box. This adjustment occurs whenever the data in the buffer changes. For fixed scale, DV will never change the Image Range.
- **Range** – These values determine the minimum and maximum values of the scale when autoscale if set to Fixed.
- **Area** – The area along with the X & Y Axis variables define the pixel domain for the graph. The options are All and Box. When All is selected, the entire canvas is plotted. When Box is selected, the Object box is used to define the region to be plotted.
- **Print** – Click this button to produce a hardcopy of the linecut graph displayed in the canvas. The printer is configured as described in Sections 2.1 DV Setup and 5.3 The Setup Tab.

5.1.5 Display Options Tab - XLineCut Display Type

The XLineCut Display Type displays a single line cut graph between 2 points or pixels in the Active Canvas. The source data is from the selected Buffer and the line cut graph is displayed in the selected Active Display (Canvas).

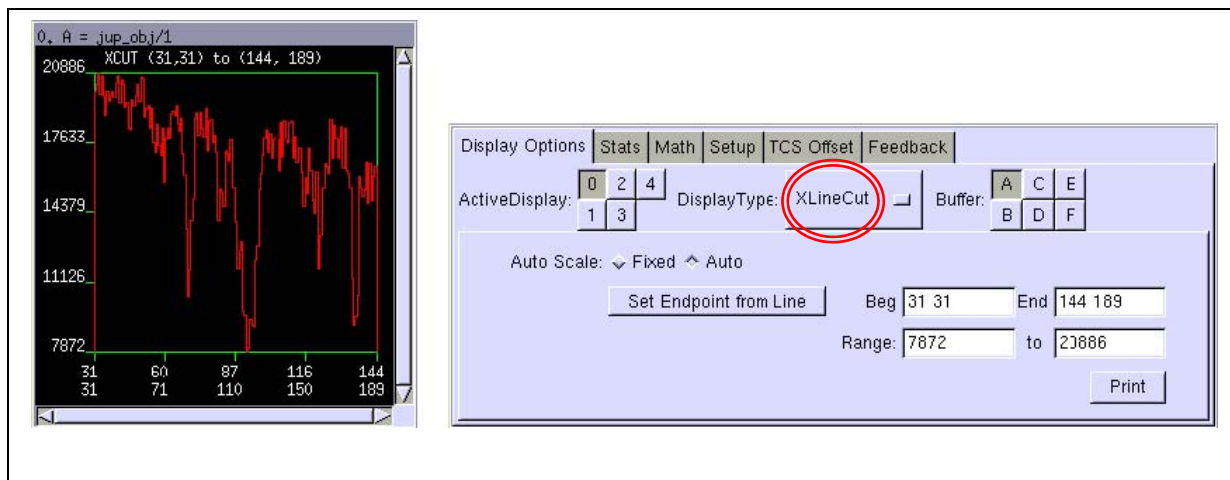


Figure 13 Screenshot of XLineCut Display Type - Display Options and Canvas

The XLineCut panel consists of the following options and settings.

- **Auto Scale** – This switch determines whether to auto-scale the graph or use the specified Range to determine the scale. The scale options are fixed or auto. When auto is selected the Image Range is automatically adjusted to the minimum and maximum values of the data displayed in the selected buffer. This adjustment occurs whenever the data in the buffer changes. For fixed scale, the program will never change the Image Range.
- **Beg to End** – These coordinates identify the endpoints of the line of pixels used to construct the XLineCut graph. The Beg entry contains the x, y coordinates for the beginning of the line whereas the End entry contains the x, y coordinates for the end of the line. These values can be set as described in Section 4 or they can be entered manually.
- **Set Endpoint from Line: TBD**
- **Range** – When Autoscale is set to Fixed, these values define the scale on the data axis.
- **Print** – Click this button to produce a hardcopy of the linecut graph displayed in the canvas. The printer is configured as described in Sections 2.1 DV Setup and 5.3 The Setup Tab.

5.1.6 Display Options Tab - Noise Display Type

The Noise Display Type is an engineering tool to display noise statistics on a group of pixels organized by columns. The source data is from the selected Buffer and the statistics are displayed in the selected Active Display (Canvas).

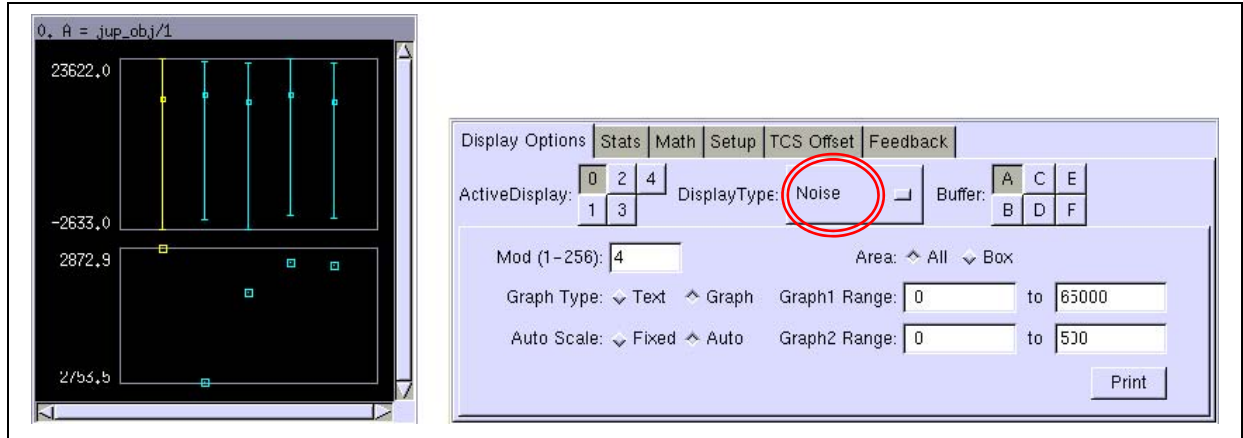


Figure 14 Screenshot of Noise Display Type - Display Options and Canvas

The min, max, mean, and standard deviation can be displayed for each output. Graph 1, the top graph, displays the Min, Max, and Mean of the pixels. The bar shows the min and max values while the point represents the mean pixel value. Graph 2, the lower graph, displays the standard deviation for each Mod.

- **Mod** – The mod parameter indicates the number of outputs in the system.
- **Graph Type** – This control allows users to indicate the display mode for the graph. 'Graph' is shown above. 'Text' gives a collimated printout of the min, max, mean, and standard deviation.
- **Area** – This control allows the user to specify the pixels used in creating the graph. The entire image (All) or just the pixels specified by the Object Box (Box) may be selected.
- **Auto Scale** – The Y axis is automatically scaled when set to Auto, or scaled using the Range values when set to Fixed.
- **Graph 1 Range** – When Auto Scale is set to Fixed, these values define the Y scale for the Min, Max, Mean graph.
- **Graph 2 Range** – When Auto Scale is set to Fixed, these values define the Y scale for the standard deviation graph.

5.1.7 Display Options Tab - Pointer Display Type

The Pointer Display is a combination of several other displays. The Pointer display contains three areas: a zoomed image display, a LineCut display, and some textual information about the data. The image display box is activated when the mouse is moved onto an image displayed in one of the other canvases. If no image is displayed, nothing will be shown here. The LineCut box displays a normal LineCut for the pixel over which the mouse is hovering. The text area displays statistics about the image box.

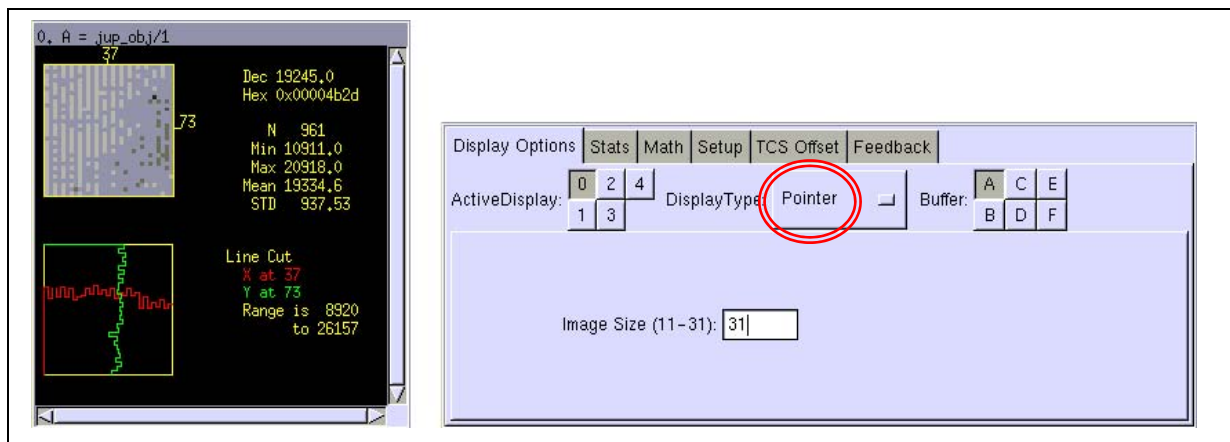


Figure 15 Screenshot of Pointer Display Type - Display Options and Canvas

The only option contained in the Pointer Display panel is the **Image Size**. This value controls the height and width (in pixels) of the image box displayed in the Active Display.

5.1.8 Display Options Tab - Stats Display Type

The information area displays the sum, mean, and standard deviation of the data display in the active canvas. The mean, variance, and standard deviation for the entire image are displayed on the top row. Below this are 3 columns labeled 'Object', 'Sky', and 'Object-Sky', with statistical values for each column. The object column displays the value on the object box. The sky column displays statistics on the sky box. If the object and sky box are of equal dimension, the object-sky column will display statistics on the pixel values obtained by subtracting the object box from the sky box.

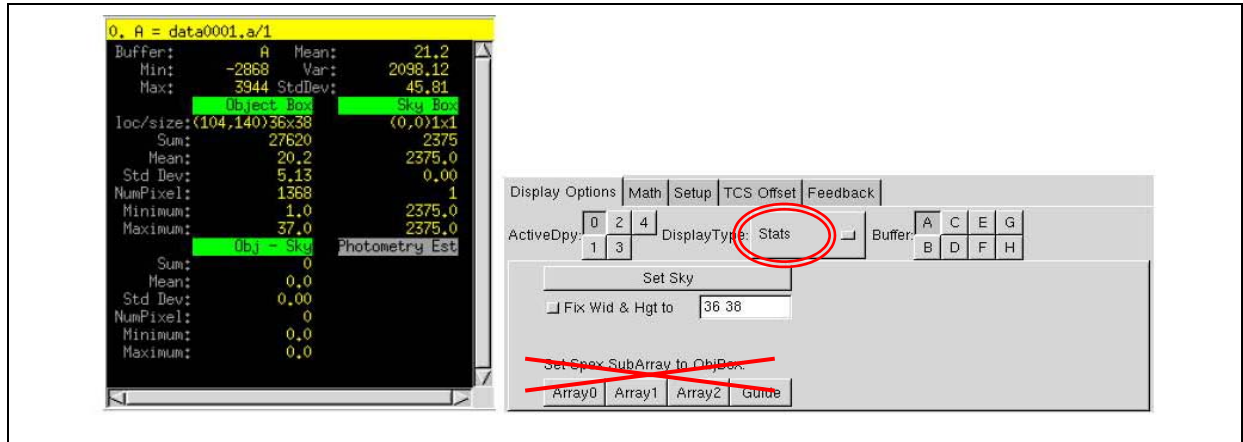


Figure 16 Screenshot of Stats Display Type - Display Options and Canvas

The Stats panel contains the following options.

- **Set Sky** - This button sets the location and size of the sky box to be equal to the Object Box.
- **Fix Wid & Hgt** - To set the width and height of the subarray, type the width and height in the Fix Wid & Hgt text entry field. The checkbox, when selected, causes the width and height to be fixed.
- **Spex SubArray Buttons** - These buttons' functionality, **Array0**, **Array1**, **Array2**, and **Guide**, are not functional in this implementation. Do not click these buttons.

5.2 The Math Tab

The Math Tab provides 4 types of operations on data in the Buffers.

- Arithmetic on the pixel values
- Transferring data between buffers
- Deleting data from a buffer
- Rotating an image.

There are buttons labeled 'Execute', 'Copy', 'Clear' and 'Rotate'. Near these buttons are various panel items used to identify the buffer or other parameters for each operation.

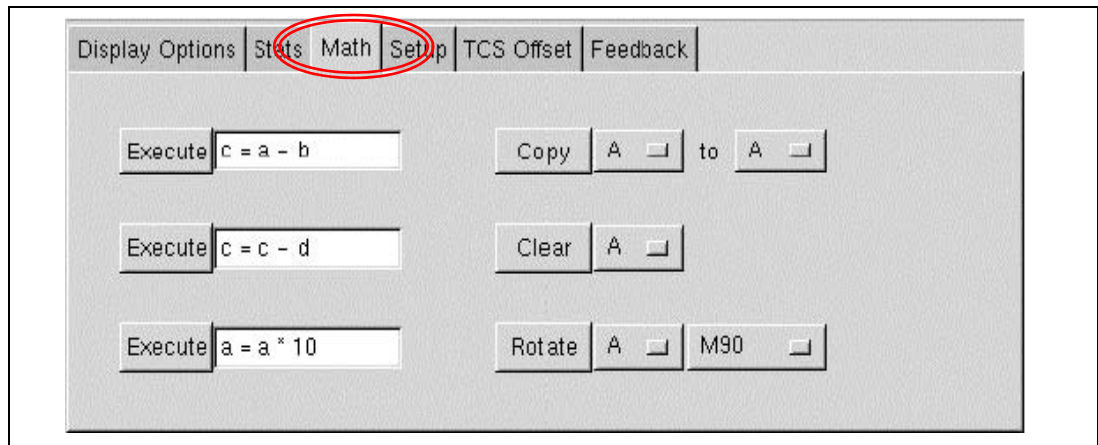


Figure 17 Screenshot of the Math Tab

Buffer Arithmetic :

For buffer Arithmetic, form an expression by selecting a destination buffer, operation (+ - * /), and the operands. The first operand is always a buffer index, the second can be a buffer index or a constant. Two examples of math expressions are shown below: When the expression is formed, click the **Execute** button beside the entry area to perform the operation.

'c = a - b' will subtract buffer b from buffer a and store the results in buffer c.

'c = c * 100' will multiply every pixel in buffer c by 100 and place the results in buffer c.

Copy Buffer :

To copy data from one buffer to another use the top row of items on the right side of the panel. First select the destination and source buffers. Select the **Copy** button to perform the transfer.

Clear Buffer :

To clear data from a buffer, identify the buffer by selecting it to the right of the clear button, then click the **Clear** button to delete the data.

Rotate Buffer :

The rotate operation allows the user to rotate the data to the left or right. Select the desired buffer, then click the **Rotate** button to rotate in the selected direction. 'M90' rotates the image -90° (counterclockwise), 'P90' rotates the image +90° (clockwise), and '180' rotates the image 180°.

5.3 The Setup Tab

The Set Up Tab contains panel items which are not likely to be changed very often. The items are usually self-explanatory.

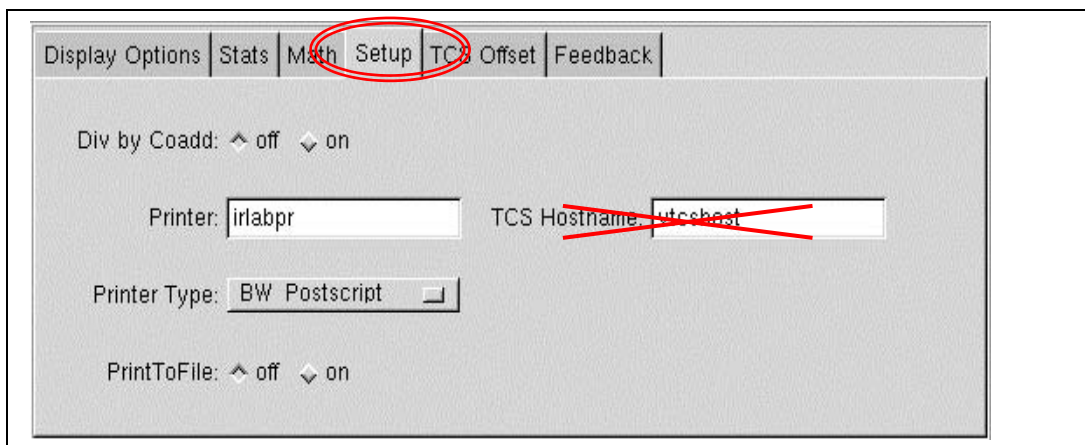


Figure 18 Screenshot of the Setup Tab

The following items are options in the Setup Tab.

- **Div by Coadd** - This option enables or disables the "divide by coadds" option. When set to on the representation of the data is divided by a normalization factor from the FITS header. When set to off actual pixel values are displayed.
- **Printer** - Identifies the printer to be used when the print command is issued or the Print button is pressed in the Main Window. Enter the name of the postscript printer on the network.
- **Printer Type** - This field specifies whether the printer has color or black & white postscript output.
- **PrintToFile** - When set to on forces print commands to write to a postscript file instead of being sent to the printer.
- **TCS Hostname** - This functionality does not apply to NICI.

5.4 The TCS Offset Tab

The TCS Offset Tab allows calculation of the relative offsets in RA and DEC between 2 pixels in an image. The name of this tab comes from a legacy implementation.

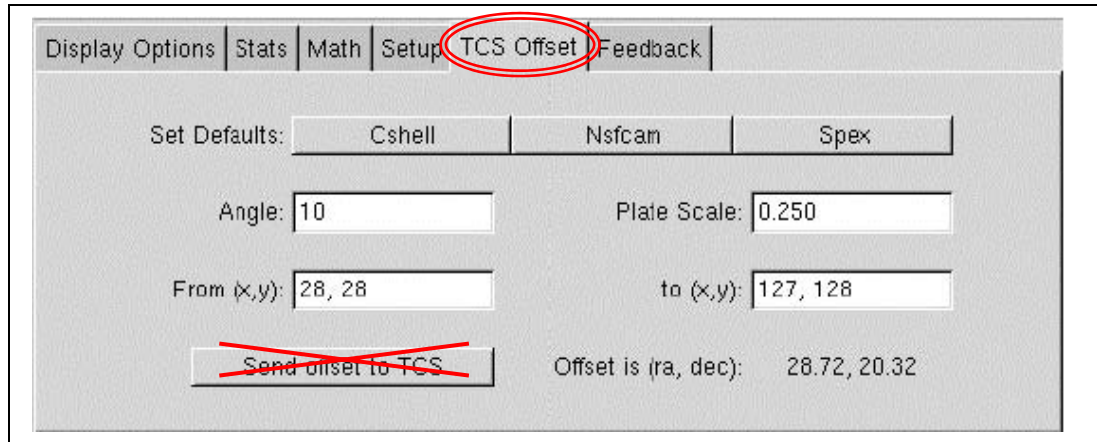


Figure 19 Screenshot of the TCS Offset Tab

The following options are available in the TCS Offset panel.

- **Set Defaults** - The Set Defaults buttons set the default values for CSHELL, NSFCAM, and SPEX. These are legacy instrument names. This functionality does not apply to NICI.
- **Angle** - The valid range is 0.0 to 360.0.
- **Plate Scale** - The valid range is 0.0 to 360.0.
- **From (x,y)** - Specifies the starting pixel for the relative offset calculation. This value can be entered manually or by drawing an XOR line as specified below.
- **To (x,y)** - Specifies the ending pixel for the relative offset calculation. This value can be entered manually or by drawing an XOR line as specified below.
- **Send offset to TCS** - This functionality does not apply to NICI. Do not click this button.
- **Offset is (ra, dec)** - Next to this label the offset is displayed after entering the Angle, Plate Scale, From and To coordinates.

Specifying the From and To coordinates in terms of their x, y pixel location on the image can be accomplished in two ways. A user can manually type in the coordinate values. A user may also draw an XOR line on the image as follows.

First, place the cursor in the image at the From pixel location. While pressing the SHIFT key, press the middle mouse button and drag the cursor to the To location. While dragging the mouse a line will be drawn between the two points. The act of drawing this line updates the From and To coordinates values in the TCS Offset Tab.

5.5 The Feedback Tab

Selecting buttons or changing values on the various menu or panel items usually generates a command to DV to manipulate the data or change the display. These commands and the error messages from dv are displayed in the Feedback Tab.

The messages output on the Feedback Tab are color-coded as follows:

- Black – commands.
- Red – application warning and error messages.
- Blue – application messages.
- Gray – minor messages printed during execution.

Message outputs in the Feedback Line at the bottom of the Main Window are equivalently color-coded.

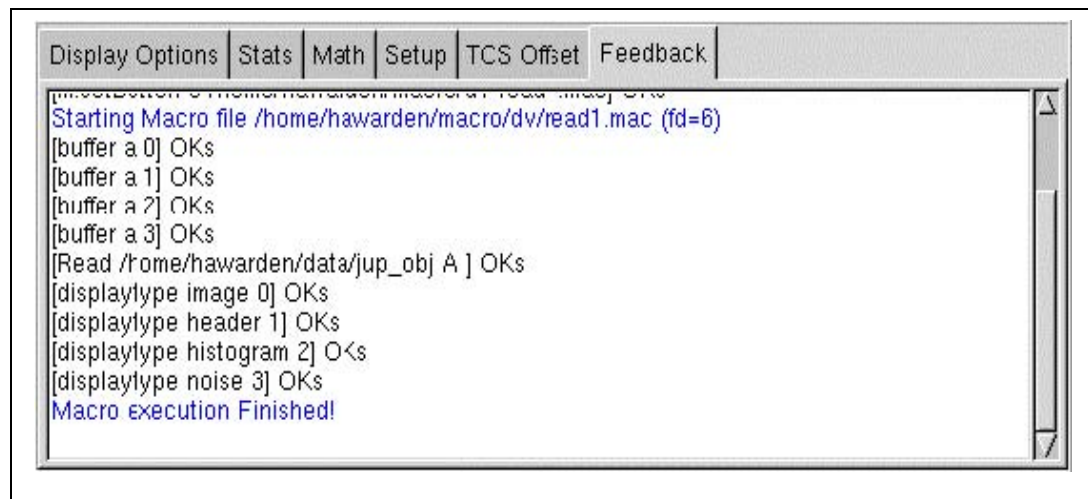


Figure 20 Screenshot of the Feedback Tab

6 DV Command Dictionary

This section describes the command set of DV using the following conventions:

Normal *Courier* fonts must be typed as shown.

Italic Courier fonts represent a choice or value to be determined by the user. These are further explained under the Range. Some examples:

{off/on} – represent a list of choice. One of the options must be selected.

[value] – the *[]* represent a optional parameter.

'Prompt' refers to buttons or options in the GUI corresponding to the command being defined.

Active – Sets the active canvas.

Prompt 'ActiveDpy' in the Display Options Tab.

Range DpyInx - Display Index (0, 1, 2, ..., etc)

Syntax *Active DpyInx*

BoxCentroid – Finds and identifies the centroid pixel in the Object Box for display dpinx. .

Prompt 'BoxCentroid' button in the Display Option (image) Tab.

Syntax *BoxCentroid [Dpinx]*

Range Dpyinx – Display Index (0, 1, 2, etc). Default to active canvas if not specified.

BoxCopy – Copies a subarray from one buffer into the specified destination buffer. The subarray is identified from the object box's x, y, width, and height.

Prompt N/A.

Range SrcBufID – Source Buffer ID (a, b, c, e,...)
DestBufID – Destination Buffer ID (a, b, c, e,...)

Syntax *BoxCopy SrcBufID to DestBufID*

BoxPeak – Finds and identifies the peak pixel in the Object Box for display dpinx. .

Prompt 'Box Peak' button in the Display Option (image) Tab.

Syntax *BoxPeak [Dpinx]*

Range Dpyinx – Display Index (0, 1, 2, etc). Default to active canvas if not specified.

BoxZoom – Set the Image Zoom in the active display so that the object box fills as much as the display as possible.

Prompt 'Box Zoom' button in the Display Option (image) Tab.

Syntax *BoxZoom*

Buffer – Changes the data buffer associated with the specified display window.

Prompt 'Buffer' in the Display Options Tab.

Range BufID – buffer ID (a, b, c, e,...).

DpInx – Display Index (0, 1, 2,...)

Syntax `Buffer BufID DpInx`

BufInfo – Displays information about a buffer to stdout. This is an example of verbose output. Non-verbose just displays the last line.

```
Status 2
naxis1 256
naxis2 256
size 4
bitpix -32
N 65536
max 3944.000000
min -2868.000000
mean 21.213593
stddev 45.805237
as/p 0.300000
divisor 1.000000
directory /home/denault/data
filename data0001.a
Min      Max      Mean      STD      data[64,64]  x  y  wid hgt  objMin  objMax
objMean objSTD
-2868.0 3944.0    21.2    45.81      25.00    168 71   15  14   12.0   540.0
39.6   57.41
```

Prompt None.

Range BufID – buffer ID (a, b, c, e,...)

Verbose_flag – 0 for concise, 1 for verbose.

Syntax `BufInfo BufI verbose_flag`

Clear – Delete the data inside a buffer.

Prompt 'Clear' button in the Math Tab.

Range BufID – buffer ID (a, b, c, e,...)

Syntax `Clear BufID`

cm.Center – The Color Map Center command determines the midpoint of the color map.

Prompt None. Type the command in the command prompt.

Range Value – ranges from 0 to 1, 0.5 being the middle.

Syntax `cm.Center value`

cm.Width – The Color Map Width command adjusts the width of the color map.

Prompt None. Type the command in the command prompt.
 Range Value – ranges from 0 to 1, 0.5 being the normalize value.
 Syntax `Cm.Width value`

ColorMap – Reads a color map definition file, which defines the color map RGB values.

Prompt Drop-down menu to the right of the Colormap display, on the menu bar.
 Range The standard color map files are: a.cm, b.cm, bb.cm, c.cm, gray.cm, i8.cm.
 Syntax `ColorMap filename`

ColorMap.Inverse – Inverses the current installed color map.

Prompt None.
 Syntax `Colormap.inverse`

Copy – Copies data from one buffer to another.

Prompt ‘Copy’ button in the Math Tab.
 RangeSrcBufID – Source Buffer ID (a, b, c, e,...)
 DestBufID – Destination Buffer ID (a, b, c, e,...)
 Syntax `Copy SrcBufID to DestBufID`

DisplayType – Determines how the data is displayed in the Display Windows.

Prompt ‘DisplayType’ menu in the Display Options Tab.
 Range DisplayTypes are:
 Image – image of pixel data.
 Header – FITS header display.
 Histogram – Histogram of data distribution.
 LineCut – Line Graph of selected row and column.
 XlineCut – Line graph between any 2 pixels.
 Noise – Channel noise calculations.
 Pointer – Follow the point in an image mode.
 DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.
 Syntax `DisplayType {Image|.../Pointer} [DpInx]`

DivByCoadds – Enables/disables the divide by coadds option. Enabling this option causes the representation of the data to be divided by a normalization factor from the FITS header.

Prompt 'Div By Coadd' buttons in the Setup Tab.

Range OFF – Display actual pixel values.

ON – Pixels values are divided by normalization factor.

Syntax `DivByCoadds {off | on}`

Echo – Display a string in the feedback text window.

Range string – Text message to be displayed.

Syntax `Echo string`

Filter1 – Changes the data in the buffers by:

1. Rescales the data so [mean-std, mean+std] maps to 25 to +25.
2. Converts any negative values to 0.

This filter algorithm could be applied on an image before using the BoxCentroid command to improve the centroid calculation.

Prompt None.

Range SrcBufID – Source Buffer ID (a, b, c, e,...)

DestBufID – Destination Buffer ID (a, b, c, e,...)

Syntax `Filter1 SrcBufID to DestBufID`

Filter2 – Changes the data in the buffers by:

1. Remaps the data so the mean is equal to 0.
2. Divides the data by the standard deviation.
3. Converts any value ≤ 1 to zero.

This filter algorithm could be applied on a image before using the BoxCentroid command to improve the centroid calculation.

Prompt None.

Range SrcBufID – Source Buffer ID (a, b, c, e,...)

DestBufID – Destination Buffer ID (a, b, c, e,...)

Syntax `Filter2 SrcBufID to DestBufID`

FullImage – This command adjusts the zoom parameter display so the entire image is visible in the active display.

Prompt 'Full Image' button in the Display Options (image) Tab.

Syntax `FullImage`

HistArea – Defines the range of pixels to be included in the histogram display.

Prompt 'Area' buttons in the Display Options (histogram) Tab.

RangeAll - all pixel values are used.

Box – only pixels in the Object Box are used.

Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `HistArea { All | Box } [dplnx]`

HistBin – Sets the number of bins for a histogram display

Prompt 'Num of Bins' in the Display Options (histogram) Tab.

Range Num – Number of bins (1 to 100).

Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `HistBin Num [dplnx]`

ImageAutoScale – When set to Auto, the ImageRange is automatically set by the auto scaling algorithm. This adjustment occurs whenever data in the buffer changes..

Prompt 'Auto Scale' toggles in the Display Options (image) Tab.

Range Fixed – Scale colors to value in ImageRange.

Auto – Automatically scales range according to data statistics.

Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `ImageAutoScale { Fixed | Auto } [dplnx]`

ImageRange – The image range specifies the minimum and maximum values that are mapped to the color map when the images are rendered.

Prompt 'Range' in the Display Options (image) Tab.

Range From -2^{31} to 2^{31} .

Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `ImageRange min max [dplnx]`

ImageScale1P – This command sets autoscale to fixed, and sets the image range to include all the pixel values except for the top and bottom 1 percent of the data.

Prompt '1-99% Fixed Scale' button in the Display Options (image) Tab.

Range Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `ImageScale1P [dplnx]`

ImageShowScale – Indicates whether to display an arcsecond scale along side the image display. Note that the necessary information is also needed in the FITS header or else the scale cannot be displayed.

Prompt 'Show Scale' toggles in the Display Options (image) Tab.

Range OFF hides, ON shows the scale.

DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `ImageShowScale { off | on } [dpinx]`

ImageZoom – Sets the zoom level for an image display.

Prompt 'Zoom' slide bar in the Display Options (image) Tab.

Range Zoom can be -5 to 20, except zoom can't be 0.

DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `ImageZoom zoom [dpinx]`

LCutArea – Defines the range of pixels to be included in the Line Cut graph.

Prompt 'Area' buttons in the Display Options (linecut) Tab.

Range All - all pixel values are used.

Box – only pixels in the Object Box are used.

DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `LCutArea { All | Box } [dpinx]`

LCutAutoScale – Turns the automatic auto-scaling feature OFF or ON for the line cut graphs.

Prompt 'Auto Scale' toggles in the Display Options (linecut) Tab.

Range OFF – Do not autoscale, scale graph to range min & max. (See LCutRange.)

ON – autoscale using max and min data values.

DpInx – Display Index (0, 1, 2,...). Optional, defaults to Active Display.

Syntax `LCutAutoScale { off | on } [dpinx]`

LCutRange – Sets the min and max data values for the Line Cut graph when the autoscale feature is OFF.

Prompt 'Range' in the Display Options (linecut) Tab.

Range From - 2^{31} to 2^{31} .

DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `LCutRange min max [dpinx]`

LCutXY – Specifies which column (X) and row (Y) are used when drawing the XY line cuts.

Prompt 'X Axis' and 'Y Axis' in the Display Options (linecut) Tab.

Range X and Y must be from 0 to max of row or column.

DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `LcutXY X Y [dpinx]`

Math – Simple math operations on image buffers can be performed in DV by entering a math expression as a command. DV can only understand very simple syntax for math using 2 buffer operands, or a buffer & a constant operand. For example,

$C = A - B$, or $C = C * 10.5$.

Prompt 'Execute' button & entry on Math Tab.

Range dest, opbuf – Buffer ID (a, b, c, ...).

Operation – must be symbol for multiplication, division, addition, or subtraction.

Num – floating point constant.

Syntax *destbuf = opbuf {*/+/-} opbuf/num*

m.edit – The macro edit command opens a macro text file using nedit text editor.

Prompt The 'Edit' button in the Macro Dialog Box opens selected file.

Range filename – any legal filename.

Syntax *m.edit filename*

m.execute – The macro execute command begins the execution of a macro file.

Prompt The 'Execute' button in the Macro Dialog Box executes the selected file.

Range filename – any legal filename.

Syntax *m.execute filename*

m.filemask – Applies the mask to the macro file list display in the Macro Dialog Box.

Prompt The 'Mask' entry in the Macro Dialog Box.

Range mask – This string is used as the mask.

Syntax *m.filemask mask*

m.load – Loads a file inside the Macro Dialog Box's text window.

Prompt Selecting any entry in the Macro Dialog Box file list automatically loads the file.

Range filename – any legal filename.

Syntax *m.load filename*

m.path – Set the subdirectory for the file list in the Macro Dialog Box. This must be an existing subdirectory.

Prompt 'Path' in the Macro dialog box.

Range directory – An existing directory.

Syntax *m.path directory*

m.refresh – Refreshes the file list in the Macro Dialog Box.

Prompt 'Refresh' button in the Macro Dialog Box.

Syntax *m.refresh*

m.setbutton – Associates the specified macro file with the specified short cut button.

Prompt 'm.setbutton' button and option menu in the Macro Dialog Box.

Range index – which function button to set, 0 to 5.

Directory & filename – Identifies the macro file to be executed when the user selects the function button.

Syntax `m.setbutton index directory filename`

m.stop – Stop the currently executing macro file.

Prompt 'Stop' button in the Macro Dialog Box.

Syntax `m.stop`

NoiseArea – Defines the range of pixels to be included in the noise display.

Prompt 'Area' toggles in the Display Options (noise) Tab.

Range All - all pixel values are used.

Box – only pixels in the Object Box are used.

Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `NoiseArea { All | Box } [dplnx]`

NoiseAutoScale – When set to AUTO, the NoiseG1Range and NoiseG2Range are automatically set by the auto scaling algorithm. This adjustment occurs whenever data in the buffer changes.

Prompt 'Auto Scale' toggles in the Display Options (noise) Tab.

Range Fixed – Scale range to value in NoiseG1Range and NoiseG2Range.

Auto – Automatically scale range according to data statistics.

Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `NoiseAutoScale { Fixed | Auto } [dplnx]`

NoiseG1Range – Sets the min and max for the noise graph 1 when the autoscale feature is set to FIXED.

Prompt 'Graph 1 Range' in the Display Options (noise) Tab.

Range From - 2^{31} to 2^{31} .

Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `NoiseG1Range min max [dplnx]`

NoiseG2Range – Sets the min and max for the noise graph 2 when the autoscale feature is set to FIXED.

Prompt 'Graph 2 Range' in the Display Options (noise) Tab.

Range From - 2^{31} to 2^{31} .

Dplnx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `NoiseG2Range min max [dplnx]`

NoiseGraphType – Sets the graph type for the noise display.

Prompt 'Graph Type' toggles in the Display Options (noise) Tab.

Range Text – the data are displayed in tabular form.

Graph – the data are displayed as graphs.

DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `NoiseGraphType { Text | Graph } [dpinx]`

NoiseMod – Sets the modular value for the noise display. This value controls how the columns are grouped together.

Prompt 'Mod' in the Display Options (noise) Tab.

Range Num – ranges from 1 to 256, 4 being the default value.

DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `NoiseMod num [dpinx]`

Path – The path identifies the subdirectory for reading and writing data files. This command sets both the paths in the save and open dialog boxes at the same time.

Prompt None. Type the command in the command prompt.

Range any legal Unix subdirectory.

Syntax `Path string`

Print – This command produces a postscript file of the graph or image in a canvas window and sends this file to the printer specified by the printer variable. This postscript file is named 'dv_print.ps'.

Prompt Each printable graph has a 'Print' button on the main panel.

Range DpInx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax `Print [dpinx]`

Printer – Identifies the printer used by the print command.

Prompt 'Printer' in the Setup Tab.

Range Enter the name of a postscript printer in the network.

Syntax `Printer printername`

PrinterType – For a hardcopy of an image, this command specifies either a color or black & white postscript output.

Prompt 'Printer Type' in the Setup Tab.

Range BW_Postscript (default)

Color_Postscript

Syntax `PrinterType { BW_Postscript | Color_Postscript }`

PrinterToFile – This command specifies whether the postscript output is actually printed on the printer or just saved to a file, when 'ON' is selected.

Prompt 'PrinterToFile' buttons in the Setup Tab.
 Range OFF – postscript file is sent to the printer.
 ON – postscript file is saved but not printed.
 Syntax `PrintToFile { off | on }`

PtImageSize – The Pointer Image Size command sets the width & height (in number of pixels) of the image display in the pointer display.

Prompt 'Image Size' on Display Options (pointer) Tab.
 Range npixels – Specifies width and height in number of pixels. Ranges limited to 11 to 31 (only odd values are used).
 dpinx – Display Index (0, 1, 2,...). Defaults to Active Display.
 Syntax `PtImageSize npixels [dpinx]`

Push – Pushes a command on DV's internal command stack. This command stack is executed after every socket connection. This command should be used only by applications connecting to DV's command socket.

Syntax `Push command`

Quit – Exits the DV program.

Prompt 'Quit' button in the menu bar.
 Syntax `Quit`

Read – Read a data file from the indicated path/filename into the specified buffer.

Prompt The 'OK' button in the Open File dialog box.
 Range path/filename – Identifies the FITS file to be read.
 buffer - Any valid buffer, for example 'B'.
 Syntax `Read filename { A | ... | F }`

ReadFile – Reads a file from the default directory into the specified buffer. Note only the filename is specified in the command.

Prompt None. Type the command in the command prompt.
 Range filename – Identifies the FITS files to be read. This file should be located in the direction specified by PATH.
 buffer - Any valid buffer, for example 'B'.
 Syntax `ReadFile filename { A | ... | F }`

ReadMovie – Reads the 1st frame from a 3D FITS files into DV.

Prompt 'ReadMovie' button in the Open File Dialog Box.

Range path/filename – Identifies the FITS file to be read.

Bufid – destination buffer, for example 'B'

Syntax `ReadMovie path/filename bufid`

ReadSock – This command is only intended for other applications that wish to send FITS data to DV through the socket.

Prompt None. This command should be issued only via a DV socket..

Range bufid – destination buffer for the data, for example 'B,' {A, B, ...}.

Syntax `ReadSock bufid`

Rotate – Rotates the data in a buffer by translating the X and Y axis. The buffer can be 90° clockwise, 90° counterclockwise, or 180°.

Prompt 'Rotate' in the Math Tab.

Range M90 – Rotate the buffer minus 90° (counterclockwise).

P90 – Rotate the buffer plus 90° (clockwise).

180 – rotate the specified buffer 180°.

Buffer – Specifies the buffer to be rotated {A, B, ...}.

Syntax `Rotate { M90 | P90 | 180 } buffer`

Save – Writes the content of a buffer to a FITS file in the current Path. Specifying a filename is optional. If a filename is not specified, the program will use the name assigned to the data.

Prompt 'OK' in the Save File dialog box.

Range buffer - the data buffer {A, B, ...}.

Syntax `Save buffer filename`

SaveFile – Mimics saving a file without actually reading the file.

Prompt 'OK' in the Save File dialog box.

Range buffer - the data buffer.

Syntax `SaveFile buffer filename`

ShowMovie – This command reads and display all frames from a 3D FITS file. Allows users to quickly view the movie data.

Range path/filename – Identifies the FITS file to be read.

Bufid – destination buffer, for example 'B'

Syntax `ShowMovie path/filename bufid`

Smooth – Applies a smoothing algorithms to the data. Each pixel value is replaced by the mean of the pixel and its 8 neighboring pixels.

Prompt None.

Range srcBuf – data to smooth.

destBuf – destination buffer.

Syntax *Smooth srcBuf to destBuf*

SpexCom – This is a legacy command that is not relevant to the NICI implementation. It is recommended that this command not be used.

Prompt None.

Range string – This string is sent to the spex IC.

Syntax *SpexCom string*

Sqrt – Takes the square root of the buffer.

Prompt None. Type the command in the command prompt.

Range srcBuf - buffer to be square rooted.

destBuf - buffer to store square rooted data.

Syntax *Sqrt srcBuf to destBuf*

StatsFixedWH – Controls the ability to set/fix the width and height of the stats box.

Prompt 'StatsFixedWH' check button in the Stats Screen.

Range BufID – Buffer ID (a, b, c,...).

ON and OFF set or unset the width and height.

Wid and Hgt must be from 0 to 255

Syntax *StatsFixedWH bufID { off | on } [wid hgt]*

StatsObjBox – Sets the size and position of the rectangle area that identifies the pixels called the ObjectBox.

Prompt None. Type the command in the command prompt.

Range 0 to 255 for x, y, wid, and hgt.

bufinx - the data buffer, (a, b, c, d, e, f)

Syntax *StatsObjBox x, y, wid, hgt, bufinx*

StatsSetSky – This command sets the SkyBox position and size to be equal to the ObjectBox.

Prompt 'Set Sky' button in the Stats Tab.

Range bufinx - the data buffer, (a, b, c, d, e, f,...)

Syntax *StatsSetSky bufinx*

StatsXORLine -- Set the XOR line position in the image canvas.

Prompt None. Type the command in the command prompt.
 Range All coordinates must be from 0 to 255.
 Syntax `StatsXORLine xbeg, ybeg, xend, yend, bufinx`

TCSCoord – This is a legacy command that is not relevant to the NICI implementation. It is recommended that this command not be used.

Prompt 'Angle' and 'Plate Scale' in the TCS Offset Tab.
 Range Angle – 0.0 to 360.0.
 PlateScale – 0.0 to 360.0.
 Syntax `TCSCoord angle platescale`

TCSHostname – This is a legacy command that is not relevant to the NICI implementation. It is recommended that this command not be used.

Prompt 'TCSHostname' in the Setup Tab.
 Range Enter a valid hostname
 Syntax `TCSHostname host`

UseHex – The pixel values are displayed in the upper right corner of the canvas on Image display mode. These values can be based in decimal or Hexadecimal.

Prompt None. Type the command in the command prompt.
 Range Off - Show values as decimal
 ON - Show values as Hexadecimal.
 Syntax `UseHex { off / on }`

XCutAutoScale – Sets the autoscale flag of the XLineCut graph.

Prompt 'Auto Scale' in the Display Options (xlinecut) Tab.
 Range OFF - Use the range set by XCutRange for the scale
 ON - Autoscale the range based on data.
 Syntax `XCutAutoScale { off / on }`

XCutRange – Sets the range of the XLineCut graph.

Prompt 'Range' in the Display Options (xlinecut) Tab.
 Range x & y must be from 0 to 255
 Syntax `XCutRange x1, y1, x2, y2`

XCutSet – This command identifies the endpoints of the line of pixels used to construct the XLineCut graph.

Prompt None. Type the command in the command prompt.

Range All coordinates must be from 0 to 255.

 Dpinx – Display Index (0, 1, 2,...). Defaults to Active Display.

Syntax *XCutSet xbeg ybeg xend yend [dpinx]*

7 Acronyms and Definitions

For DV commands see the DV Command Dictionary.

DV	Data Viewer
FITS	Flexible Image Transport System