

USING 'XSHOW' FOR DATA VIEWING AND EDITING

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About XSHOW

XSHOW is a graphical user interface written in IDL (RSI, Boulder, CO) for viewing and editing NOAA/GMD aerosol data. It can be used to look at raw, edited or averaged station aerosol data so long as the data is in the GMD format.

Getting Started

There are two ways to start an XSHOW session.

1. clicking on an XSHOW icon
2. opening a terminal window, go to a station directory: `cd stn/new` and typing any of the following at the command prompt:
 - (a) `xshow`
 - (b) `xshow mode = 1` same as `xshow mode = raw`
 - (c) `xshow mode = 3` same as `xshow mode = edit`
 - (d) `xshow mode = 4` same as `xshow mode = average`

Depending on your default XSHOW settings, typing XSHOW and clicking on the XSHOW icon will typically open an XSHOW window in raw or edit mode (Figure 1).

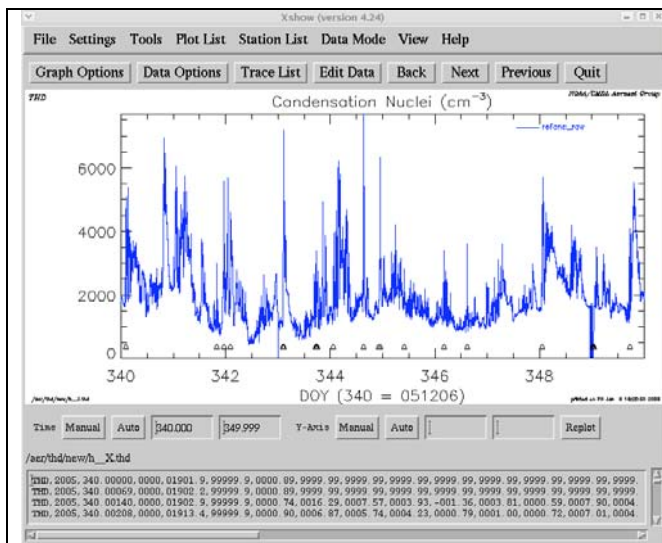


Figure 1a Example XSHOW plot window



Figure 1b XSHOW 'Entry window'

If for some reason all you get is the entry window (Figure 1b), but no plots then XSHOW did not find a valid data file(s) for the selected/default mode. You will need to extract data or switch data modes to view plots. More about that later!

Getting help

Once you have an XSHOW session open, you can get help by clicking on the word 'Help' in the upper right corner of the window (see Figure 1) and choosing the first option 'Xshow Help' (Figure 2a). This will bring up a second window with clickable links explaining various options and information about XSHOW. (Figure 2b) This help information is included in Appendix A.

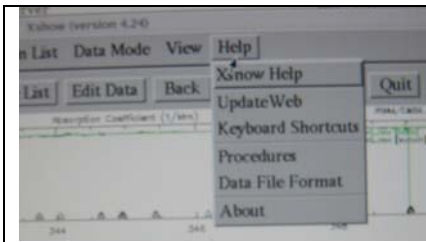


Figure 2a Help Menu

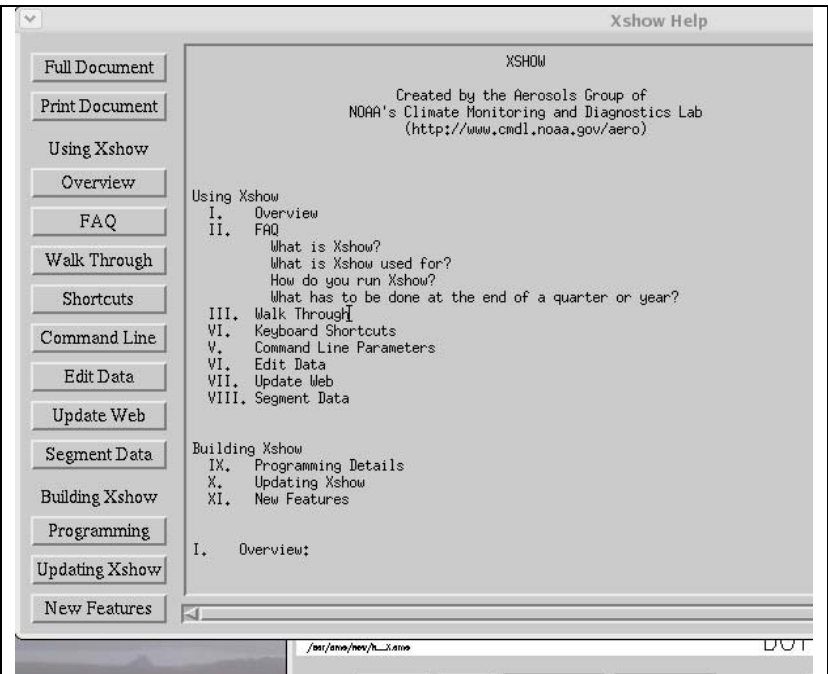


Figure 2b XSHOW help document (see appendix A for document)

Quitting XSHOW

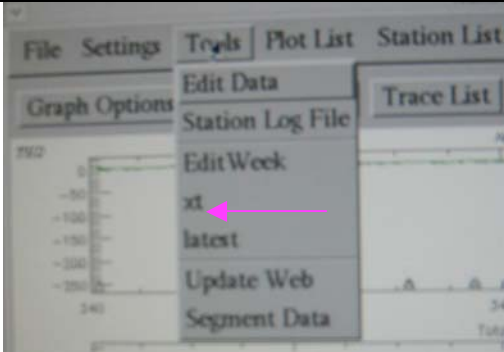
Click on the 'Quit' button in upper left. This will close all the XSHOW windows that are open.

Extracting data

There are two ways to extract data, 'xt' and 'editWeek'. Both can be used in a terminal window at the command prompt or from a window brought up in XSHOW.

To extract data to look at, for example if you want to look at 10 days worth of data, then 'xt' is the script to use (Table 1).

Table 1 how to use 'xt' to extract data

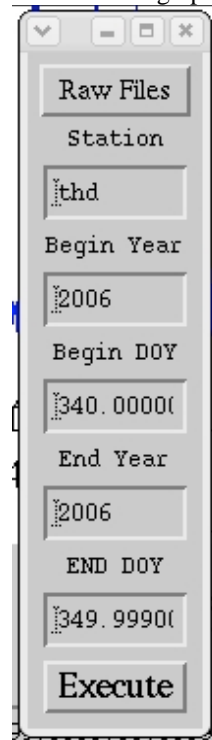
	xt	XSHOW
	<p>Command Line</p> <p>To extract raw data: <code>xt -a YYYY DDD YYYY DDD</code></p> <p>For example: <code>xt -a 2005 100 2005 107</code> will extract raw data between day of year 100 and 107 for year 2005</p> <p>To extract edited data: <code>xt -e 2005 1.5 2005 2.5</code> will extract edited data between day of year 1.5 and 2.5 for year 2005</p>	 <p>On the 'Tools' pull down menu choose 'xt'.</p>

To extract hourly averaged data:
`xt -h 2004 1 2005 366`
 will extract edited data between day 1 of year 2004 and day 366 for year 2005.

More xt command line options are given in Appendix B

NOTE: The DOY value must be ≥ 1 and < 367
So to extract a whole year which is a leap year:
`xt -a 2004 1 2004 366.99999`

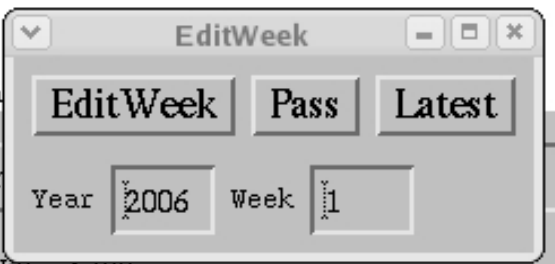
This will bring up the xt window:



Choose data type: raw, edited, hourly, daily, or monthly, station and the date range and then select 'execute'

Station data editing is typically done in weekly increments where the week is defined as Monday through Sunday (thus editing for the previous week can commence on a Monday). The script editWeek (Table 2) is used to extract a week's worth of data for editing

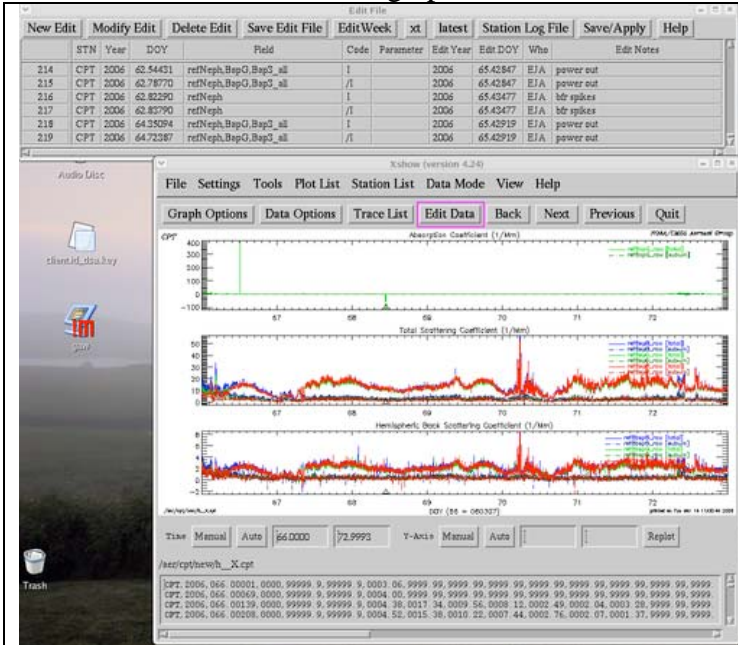
Table 2 Using editWeek to extract weekly data for editing

editWeek	
Command Line	XSHOW
<p>To edit the first week of data in 2005 type:</p> <p><code>editWeek 2005 1</code></p> <p>more editWeek options are given in Appendix B</p> <p>If you type:</p> <p><code>latest</code></p> <p>at the command line you will get a series of lines telling you what week it currently is and the number of the last week of data that was passed.</p>	<p>On the 'Tools' pull down menu choose 'editWeek'.</p> <p>This will bring up the editWeek window:</p>  <p>Choose the year and week you want to edit and click on the 'EditWeek' button.</p> <p>If you can't remember what week of editing you are on, select the 'Latest' button and it will bring up a window telling you what week it is and what the last week of data that was passed was.</p>

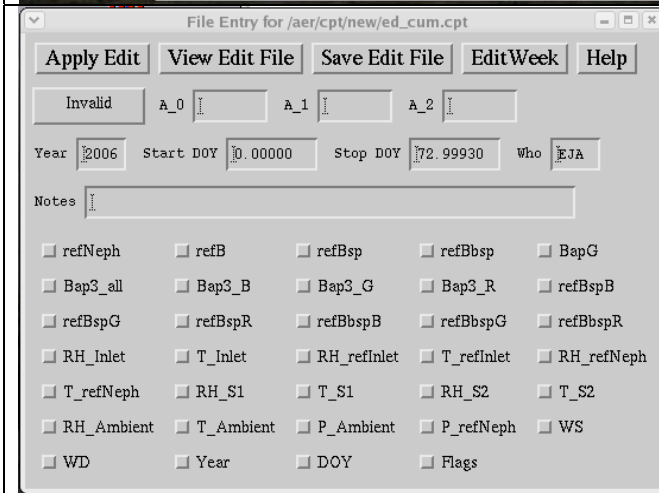
Getting into Edit Mode

Specific things to look for in the data are described in the next section ‘Editing Data – what to look for’. The mechanics of data editing are described here.

Once you’ve extracted data using editWeek, and you have an XSHOW window open showing the extracted data, you are ready to begin editing. Click on the ‘Edit Data’ button at the top of the XSHOW window to bring up the edit directives file.

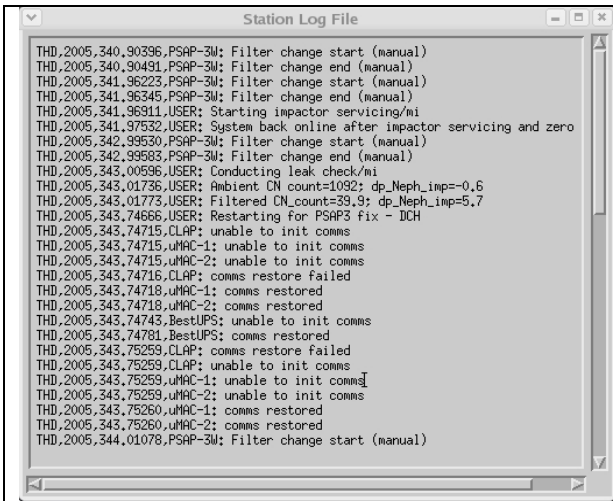


If you click on the ‘Edit Data’ button (highlighted in pink) the ‘Edit File’ will pop up. To begin editing, click on the ‘New Edit’ button.



This File Entry window pops up when the ‘New Edit’ button is clicked. This window allows you to put in:

- a start and end DOY for an edit,
- the initials of the person doing the editing,
- a note about why the edit is being made (e.g., pump failure)
- select what parameters you wish to remove for the edit.



A useful window to have up when doing editing is the 'Station Log File' which is under the 'Tools' pull down menu. The station log file allows you to view the entries station personnel made during the week so you know, for example, when the impactors were serviced.


The Xshow (version 4.24) interface is shown with a graph of 'Absorption Coefficient (1/Mm)' and a 'File Entry' form. The graph shows a sharp peak at approximately 66.510. The 'File Entry' form is filled with the following information:

- Buttons: Apply Edit, View Edit File, Save Edit File, EditWeek, Help
- Fields: Invalid, A_0, A_1, A_2
- Year: 2006
- Start DOY: 66.51
- Stop DOY: 66.51
- Who: EJA
- Notes: bap spike due to PSAP filter change
- Checkboxes: refNeph, refB, refBsp, refBbsp, BapG, Bap3_all, Bap3_B, Bap3_G, Bap3_R, refBspB, refBspG, refBspR, refBbspB, refBbspG, refBbspR, RH_Inlet, T_Inlet, RH_refInlet, T_refInlet, RH_refNeph, T_refNeph, RH_S1, T_S1, RH_S2, T_S2, RH_Ambient, T_Ambient, P_Ambient, P_refNeph, WS, WD, Year, DOY, Flags

This shows an example edit. I've zoomed in on a spike in the absorption data. I can see in the 'Station Log File' that this spike is caused by a filter change. I then enter the appropriate info in each space in the 'File Entry' window. For places where you type in a value (e.g., the Notes section) you need to hit return afterwards to get the data accepted by the window. Once you are done filling out the 'File Entry' window, choose the 'Apply Edit' button and the 'Edit File' window will be updated to include the entry (see first picture above).

Passing data after it is edited

Once a week's worth of editing is done the data must be 'passed'.

Pass	
Command Line	XSHOW
<p>To pass the first week of data in 2005 type:</p> <p><code>pass 2005 1</code></p>	<p>On the 'Tools' pull down menu choose 'editWeek'.</p> <p>This will bring up the editWeek window:</p>  <p>Enter the year and week you wish to pass in the window and click on 'Pass'</p>

Editing Data – Things to look for

Even the GMD-style aerosol rack is not perfect (!) and occasionally there are instrument maintenance activities or system glitches that result in data that need to be edited out. Below I show some plots of some of the more common scenarios which require editing.

Pump failure

Pumps occasionally fail. The carbon vane pump vanes may break, the diaphragm(s) in the diaphragm pump may crack and the blowers can corrode and stop working. Depending on how your system is plumbed, pump failures will result in different data editing commands. Below are some examples of data plots when pumps fail.

<p>Here the analyzer pump has failed</p>	<p>This means there is no flow going through the impactors and thus the pressure difference for the 1um impactor is the same as for the 10 um impactor</p>	<p>No flow through the analyzers means the instruments aren't pulling in aerosol to measure, so for example, the scattering will be low.</p>

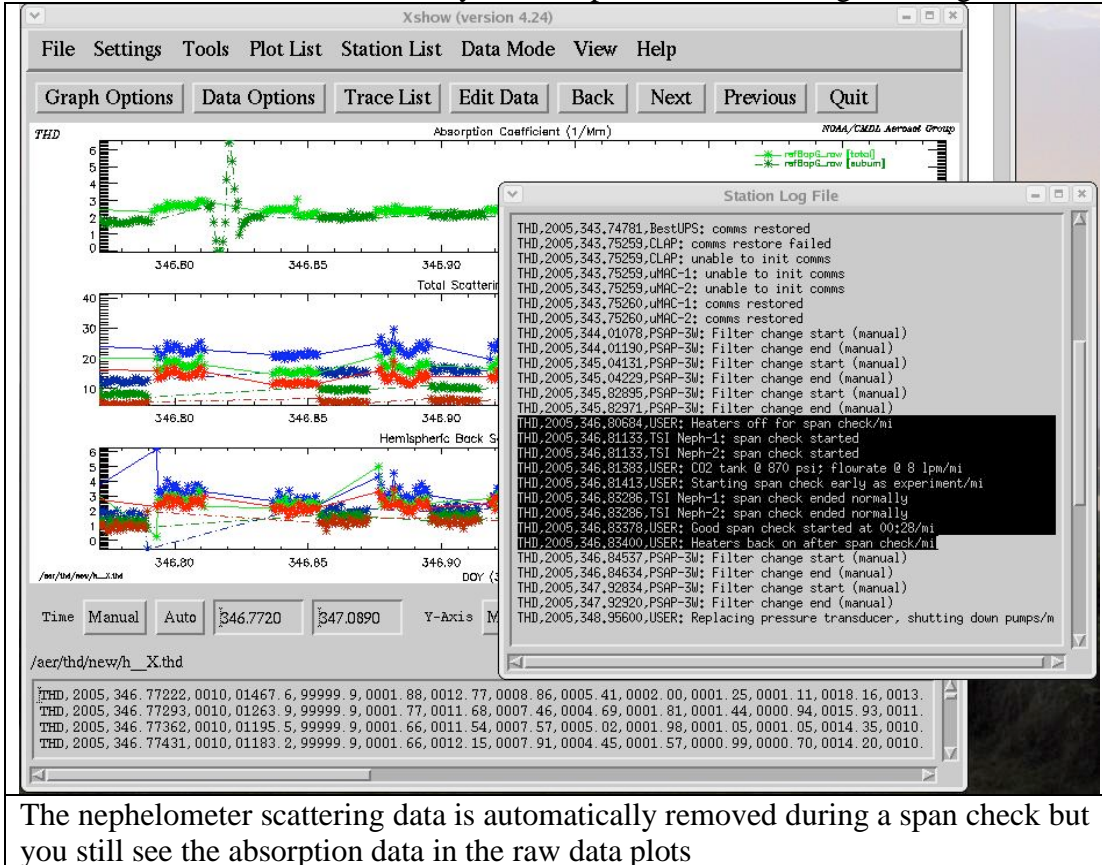
Power outage

When there's a power failure, the UPS protects the instruments and the computer and the system will run after the power has failed for as long as the UPS battery supports it. However, the pumps are usually not working as they are not behind the UPS. This often results in plots looking like the pump failure plots. There may also be some spikes when the pumps come back on again.

<p>CN trace during power failure</p>	<p>CN status during power failure</p>

Span Check

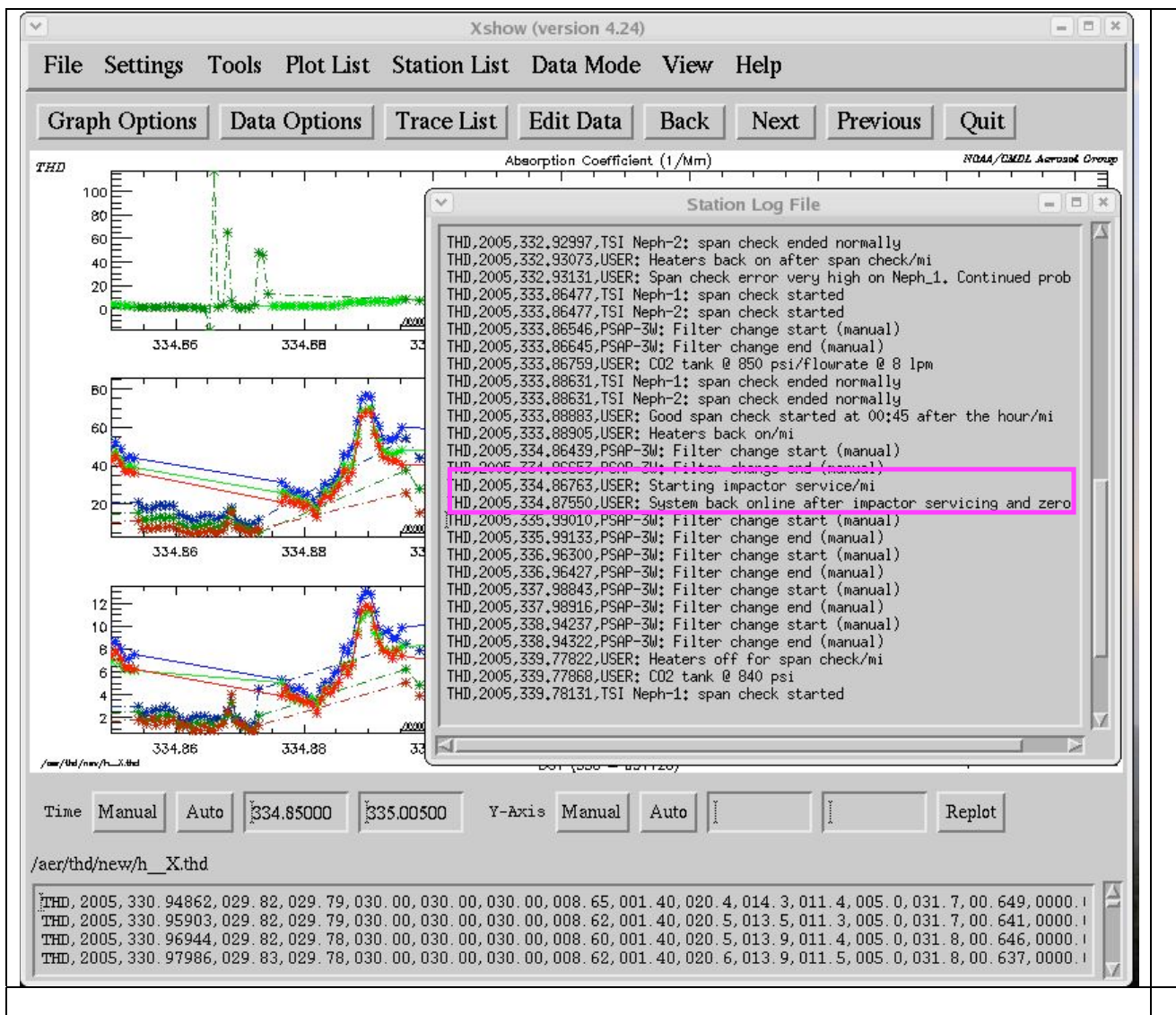
The software automatically marks as invalid the nephelometer data acquired during a span check. Because the PSAP instrument requires a nephelometer scattering measurement for the PSAP scattering correction, the PSAP measurements will also be automatically invalidated in the edited file (but they will show up in the raw file). So while you don't necessarily have to invalidate either of these data streams, it's a good idea to look closely at the measurements around the span check to make sure there aren't any related spikes or other strange looking data.



The nephelometer scattering data is automatically removed during a span check but you still see the absorption data in the raw data plots

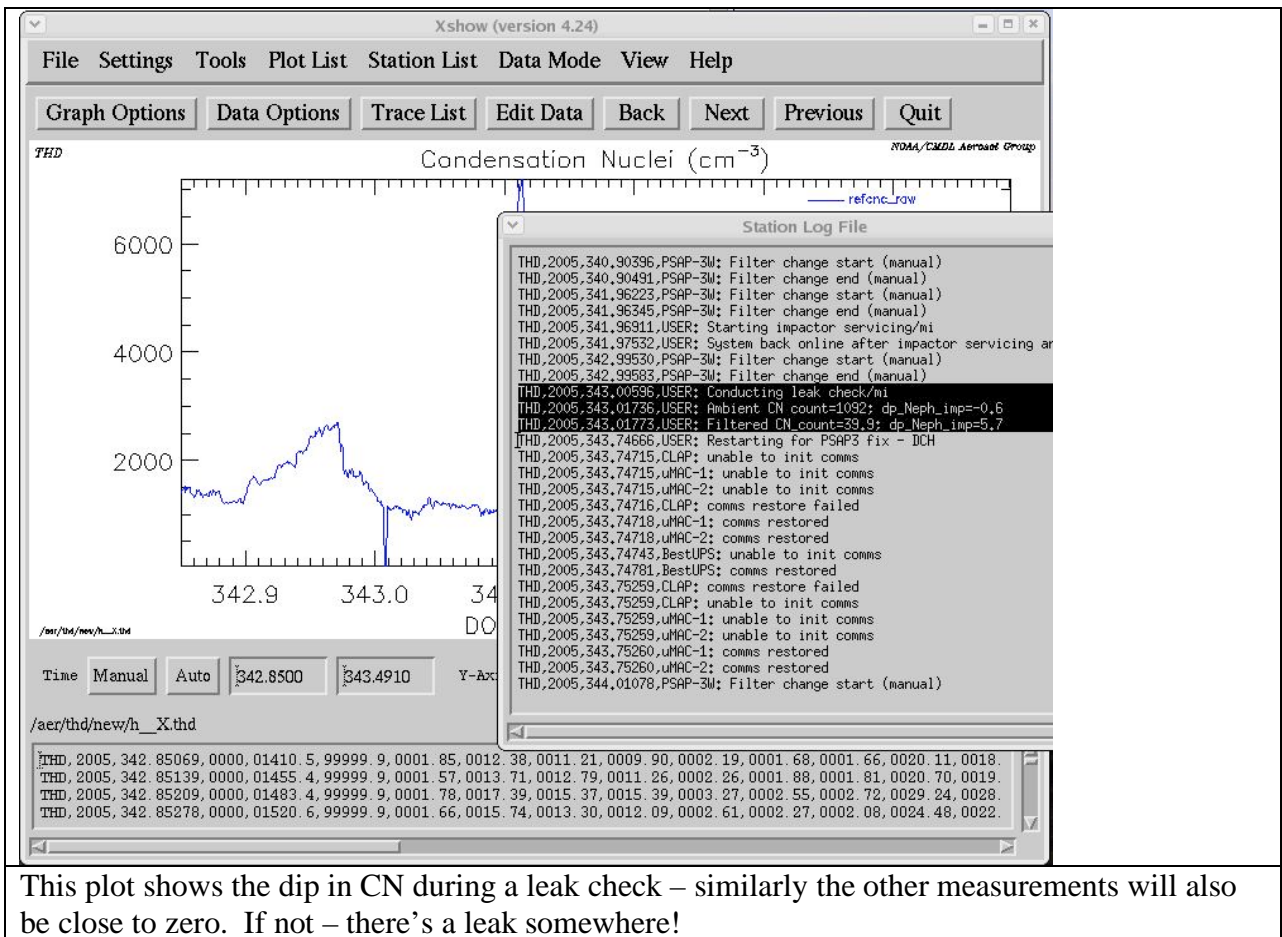
Impactor Servicing

Nephelometer and PSAP measurements taken during the impactor servicing should be marked as invalid because the instruments are bypassed.



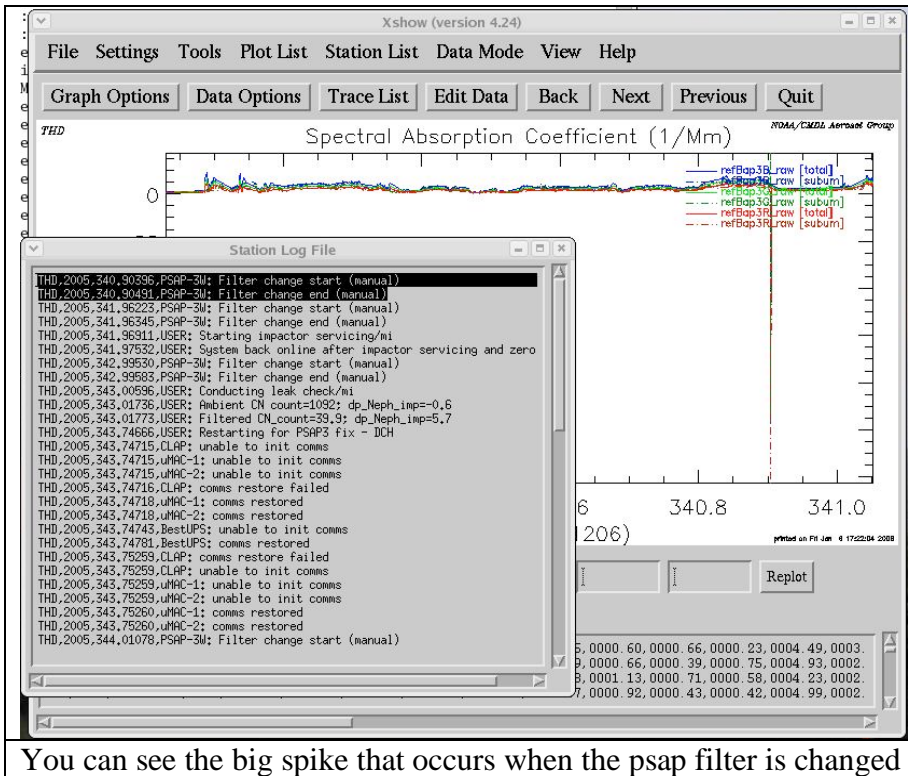
Leak check

All measurements taken during a leak check should be marked as invalid because there is a filter on the aerosol inlet and the CN counter is measuring whatever might sneak into the system between the splitter and the nephelometer exhaust.



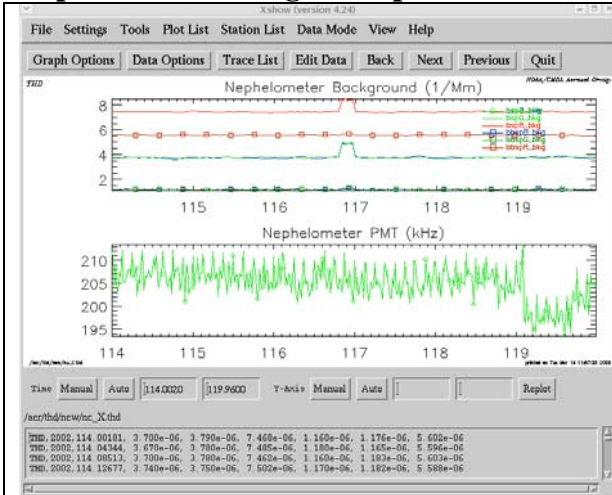
PSAP filter change

There are often very large spikes that occur when a PSAP filter is changed. Whether these are due to light getting into the instrument or the new filter settling into place or the flow adjusting back to its sampling value is unclear. Regardless of the cause these spikes should be invalidated. If you are editing a station that has a 3-wavelength PSAP you will need to choose both the 'BapG' and the 'Bap3_all' to be sure to get rid of the spike in all three wavelengths. (We put the absorption measurement at 550 nm in to two columns in our data file to be consistent with our file format before we had 3-wavelength PSAPs.)

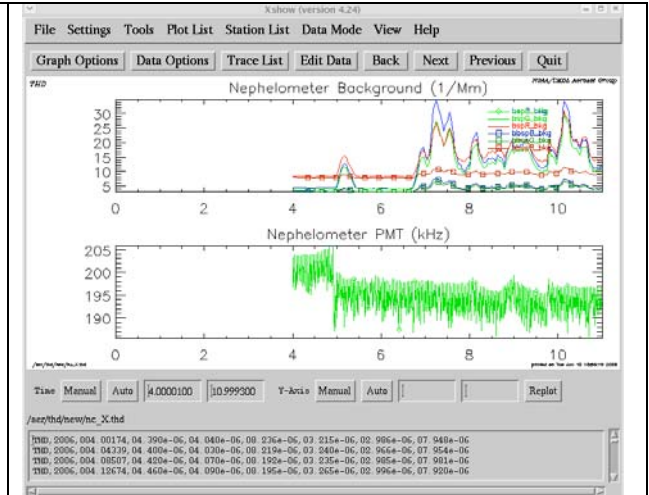


You can see the big spike that occurs when the psap filter is changed

Nephelometer background problems



Occasionally the neph background values – the scattering value the neph measures when a filter is switched in line automatically every hour – will show a slight blip. Usually this is nothing to worry about – in this particular case the pumpbox was being worked on.



But if the neph background values look like this – this is a problem. On this occasion the automatic valve on the neph which switches the zero filter in-line had failed. (note the difference in the y-axis scale between these two cases. Typically all the background values should be less than 10 and the back-scattering background values should be less than 5 (red wavelength values tend to be a little higher).

Appendix A – XSHOW Help documentation

Note: Here I've only included the parts of the documentation that relate to data viewing or editing. For complete documentation, read the document in the xshow window.

XSHOW

Created by the Aerosols Group of
NOAA's Climate Monitoring and Diagnostics Lab
(<http://www.cmdl.noaa.gov/aero>)

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I. Overview:

Xshow creates various plots of CMDL's aerosol and housekeeping data using input data files from the /aer/"stn"/new directories, where "stn" is the three letter symbol for the monitoring station. Hence, each station has its own directory and a number of files for that station. To view plots (and data), only the station needs to be identified and the input data files will be loaded. Time series plots are created based on the data files in the station directory. Besides time series plots, Xshow can also create several types of statistical plots.

Xshow can either be started in graphical mode or in text mode. In graphical mode, the user can use various buttons, sliders, and text windows to view and manipulate the data. In text mode, operations are performed automatically without user input (other than what the user has typed in as command line arguments). The text mode can be called from the command prompt, from a Cshell or perl program, or even from Xshow itself. Arguments can be passed to Xshow to control the way plots are created. Xshow can be started in text mode with one of the following three commands, "xshow", "aveStats", or "makeF". The "xshow" command is used to create time series plots, the "aveStats" command is used to create statistical plots, and the "makeF" command is used to create fitted f(RH) data files. To see a list of arguments for each of these commands, type the command followed by "-help", i.e. "xshow -help". The "xshow" command is called during the night to create the QC Web page plots. The "aveStats" and "makeF" commands are called from Xshow itself using the "UpdateWeb" feature to create yearly statistical plots.

II. FAQ:

What is Xshow?

Xshow is an IDL utility that can view, manipulate, analyze, and edit data stored in CMDL aerosol file formats. Xshow has two basic modes of operation. The first is the text mode which permits many of Xshow's functions to be performed on the command line of a Linux/UNIX system. Such functions might include the creation of postscript, encapsulated postscript, and png files. The second mode of operation is the graphics or interactive mode. When in the graphics mode, Xshow has a window environment where the

user can view data and control of the full range of Xshow's capabilities. This interface consists of a large viewing screen where plots are displayed, a text window to view data, and a large set of controls for changing the displaying of the data.

What is Xshow used for?

Xshow is primarily used to view and edit time series of data obtained from NOAA's remote monitoring stations and as an aid in data analysis. Specifically, Xshow is called from the crontab to create png files that are displayed on the Aerosol web site. These daily plots are used to look at the data from various stations and see if everything is working correctly. In the editing process, Xshow is used to view raw and edited data in an iterative process to remove bad data. Xshow also has many options that filter and manipulate data for easier viewing, troubleshooting, analysis and graphical output.

How do you run Xshow?

Xshow can be started simply by typing "Xshow", but also provides much greater flexibility with a large list of command line arguments. A complete list of command line options can be viewed by typing "Xshow -help". Xshow resides in the directory "/aer/prg/idl/xshow_linux".

What has to be done at the end of a quarter or year?

At the end of a quarter you need to make sure all weeks have been edited. You can use the "Latest" feature for this (under the "Tools" pull down menu or the shortcut key is capital L). You will need to run "updateWeb" with the 'process option' on. This runs "archiveClean" to apply all the edits to create and archive data files, it runs "consolidateQtr" to create average data files, and it updates the quality assurance Web pages. "updateWeb" can either be run from Xshow or from the command line. Once "updateWeb" is finished you need to look at the QC Web page and check that everything looks good. Check the new statistical plots and the data report on the web at:

http://www.cmdl.noaa.gov/aero/net/stn/datacheck_stn.html

If you find any problems you will have to make additional edits and rerun "updateWeb". After everything looks good on the QC Web page you should run "splitQtr" to reduce the size of the station cum files (splitQtr is not in Xshow, it is run from the unix/linux prompt). The procedure is similar at the end of the year except you will be working with the whole years worth of data.

III. Walk Through:

This section describes Xshow and its various features. It would be very helpful to run Xshow in its graphical mode while reading this section. The following is a list of steps to follow that will run through some of Xshow's attributes and functions.

1. Type `Xshow' at a command prompt that is running X windows. This will bring up the Xshow graphics interface. If this does not happen, check to see if your system is running X windows or an emulator, that you have access to the Xshow Cshell script /aer/prg/csh/xshow, and that IDL is installed on your system. The Xshow graphics interface consists of several distinct parts. The most notable is the draw window. This should currently have a CMDL aerosol logo displayed. If you are in a station directory (e.g., /aer/nsa/new) time series plots for that station will be created and displayed.

If you are not in a station directory you can choose a station using the pull down 'Station List' menu. Once a station is selected, the pull down button 'Plot List' will list the plots that can be selected and displayed on the draw window. Below the draw window where the plot is displayed are the "Manual" buttons and text windows. The Manual buttons allow enlargement of sections of the plot, both in the x and y directions. Below the Manual button is the text window. This provides a text display that can be used to look at the data file from which the data plot was created.

2. Press the `Stations' button with the left mouse button. Once this is done, a pull down menu will appear with a column list of the available stations.
3. Move the mouse until a station is highlighted and release the button. This selects a station and Xshow will immediately begin loading in the working files

for that station. The result of this loading process will be displayed on the screen. Once the files have finished loading, the list of plots that are available for the station will appear as a column of buttons in the "Plot List" menu. The first plot from that list will now be displayed.

4. Press the "Next" shortcut button (or hit the n key on the keyboard). This will select the next plot in the list and display it on the draw window. In this manner all the plots available for that station can be viewed.
5. Press the 'Data Mode' button. You will get a pull down menu that will allow you to change the plot mode. Your choices of data mode include raw, clean, edited and averaged

6. Move the mouse until a plot mode is highlighted and release the button. This plot mode affects what set of plots can be viewed. The first plot mode is 'raw'. In the raw mode, all the plots are obtained from files that do not include edits. The next mode in the list is the 'edit' mode. The edit mode only uses the a_x.stn, a_eX.stn, h_x.stn, and h_eX.stn files. This mode is useful during the editing process. Each plot has two panes, one pane has the raw data and the second pane has the edited data. The next mode is the clean mode, which displays only edited data. The last mode is the averaged mode. The average mode takes data from the averaged data files. Once a plot has been selected, the plot list in the plot menu will be updated to reflect the plots that are available based on the new mode. If no files or plots are available for a given plot mode, a warning screen will appear.

7. Select the 'Graph Options' shortcut button to bring up the Graph Options window. This will give a list of options that affect how the data are plotted. Each option has a toggle button to the left of the options. When this button is pressed (darkened) the option is active and when the button is not pressed (light), then the option is not active. Some of the options and how they affect the plot and data are described next.

Trace Legend This will determine if a data trace legend is placed in the upper right corner of each plot.

Fixed scale This determines if the plots are autoscaled or given constant y-ranges.

Polluted line This determines if the pollution flag is plotted as a line in the plots.

Log scaled This determines whether the data (CN and Nephelometer data) is log scaled.

Grid This determines whether the plots have grids.

Data Gaps Determines if data gaps are connented by a straight line or if a blank gap is left in the plot. By default gaps are connected by a line since it is faster to make plots.

Plot Average This is a slider that when moved and released, which determines the number of points to average when plotting the data.

8. Select 'Trace List' Shortcut button to bring up a pop-up menu window. This menu contains a list of data traces for the current plot. If the toggle button by the name of the data trace is pressed, then the data trace will be put on the plot, but if the button not pressed (lightened), then the data will not be plotted. This list is updated when the current plot is changed.
9. Below the draw window is the "Manual" button used to zoom in on the graph. This option allows a range of data in the x-direction and in the y-direction to be specified (in effect make enlargements of smaller sections of the data).
 - Press the Manual button in the x-axis portion of the zoom window. After this the new x range for the plot needs to be selected with the mouse.
 - Press the mouse on a point in the plot where you want the beginning zoom range to start. Alternatively you can type in a start time.
 - Press the mouse again, but on a point in the plot where you want the ending zoom range to end. Alternatively you can type in an end time.
 - Press Replot to redisplay the current graph with the new boundaries given bythe new zoom ranges. This effectively enlarges a section of the graph for greater

clarity and ease of viewing. This can also be repeated with the y dimension of the plot.

Note: You can also enlarge the plot by entering a time range greater than what is displayed. If this is 10% larger than the data currently loaded in Xshow, a call to "xt" will be used to extract more data. Once the data has been extracted it will be loaded and displayed.

10. Press the scrollbar in the text window located at the bottom of Xshow's display. This will scroll through the data file used to make the current graph.

11. Try different combinations of plot options, plot modes, and plots to get used to Xshow. When you are done, chose the last 'Quit' button to exit.

IV. Keyboard Shortcuts:

Shortcut Keys defined in Xshow:

- a - Auto Scale Plot.
- b - Go Back to Previous Plot.
- c - Bring up the Controls Window.
- d - Bring up the Data Control Data Window.
- e - Bring up the Edit Data Window.
- f - Bring up the Filter Data Window.
- g - Bring up the Graphs Control Data Window.
- h - Bring up the Help Window.
- l - Bring up the Station Log File Window.
- L - Display the latest editing information
- n - Display Next Plot in list.
- p - Display Previous Plot in list.
- P - Brings up the Panel Window.
- q - Quit Xshow.
- r - Replots the graph.
- s - Bring up the station List Window.
- S - Bring up the Statistical Plots Window.
- t - Bring up the Traces Window.
- u - Bring up the Update Web Window.
- w - Bring up the editWeek window.
- X - Brings up the X-Y Plots Window.
- x - Start mouse zoom for x dimension.
- y - Start mouse zoom for y dimension.
- ! - Reload/Plot Raw Data
- @ - Reload/Plot Edited Data
- # - Reload/Plot Clean Data
- \$ - Reload/Plot Averaged Data
- % - Change the plot symbol to a triangle.
- ^ - Change the plot symbol to a Square.
- & - Change the plot symbol to a X.
-) - Change the plot symbol to histogram mode.
- + - Change the plot symbol to a plus sign.
- * - Change the plot symbol to an asterisk.
- . - Change the plot symbol to a dot.
- ? - Brings up the Help Window.

Shortcut Key Example:

You can type "a" and "r" to change to auto scaling and replot the graph.

V. Command Line Parameters:

The IDL Xshow code can be started by using one of thress Cshell commands, "xshow", "aveStats", or "makeF". The "xshow" command is used to make time series plots, the "aveStats" is used to make statistical plots, and the "makeF" command is use to create fitted f(RH) data files. A current list of command line arguments can be obtained by typing the command with the "-help" option. For example, "xshow -help".

There are three forms of command line parameters, the first being a single keyword, the second being a single keyword prefaced by a + or - to symbolize whether the keyword is to be on or off, and the third is a keyword that is assigned a value.

I. Examples of single keyword parameters are as follows:

air, bld, bnd, brw, cpo, iap, kco, kos, kpo, lar, mlo, mln, nsa, nwr, p-3,
sfc, sgp, smo, spo, wsa

All of the previous keywords are abbreviations for stations and declare a default station from which to load data upon starting. Currently "xshow" only allows one station; however, "aveStats" allows multiple stations. If a argument is passed to "xshow" that is not understood an error will be given.

raw
edit
clean
average
ave
avg

These keywords put Xshow into different plot modes. i.e., "xshow raw". The "mode = ?" statement will also put Xshow into different plot modes, where ? is 1 for raw mode, 2 for edit mode, 3 for clean mode, and 4 for average mode i.e., "xshow mode = 1".

bw
color

These two keywords will automatically put Xshow into text mode. `bw' cause creation of black and white graphs, and 'color' will create color graphs. If both of these keywords are used, then the last one will be used with the other one being ignored.

png
png800
eps
ps

These keywords will put Xshow into text mode and send output to a file of the appropriate type (ps,eps, or png). PNG files are used as a replacement for the gif file format that is not supported by IDL after versions 5.4. Without the `bw' and `color' keywords, the default is set as if `color' had been selected.

screen

The "screen" keyword can be set so xshow acts like it is in text mode, but displays the plots to the screen.

Examples:

xshow	Puts Xshow in graphics mode without loading any files.
xshow bnd	Puts Xshow in graphics mode, loads the files for station bnd, and displays the first graph.
xshow wsa bw	Puts Xshow in text mode, loads the files for station wsa, and prints the set of graphs to the bw printer.
xshow wsa color ps	Puts Xshow in text mode, loads the files for station wsa, and makes color postscript files for the graphs. The file names are based on the plot names and have a extension based on the type of file (.ps, .eps, .png).
xshow spo png	Puts Xshow in text mode, loads the station spo files, and makes color png files for the graphs.

II. The second type of command line parameters are as follows:

[+,-]LEGEND	Whether the plot should have legends on the plot.
[+,-]NOTES	Whether the plots should have notes.
[+,-]ID	Whether the plots should have a station id.
[+,-]TITLE	Whether the plots should have a title.
[+,-]XTITLE	Whether the plots should have x axis title.
[+,-]XLABEL	Whether the plots should have a x axis label."
[+,-]YTITILE	Whether the plots should have a y axis title."

[+,-]YLABEL	Whether the plots should have a y axis label."
[+,-]XGRID	Whether the plots should have a x grid.
[+,-]YGRID	Whether the plots should have a y grid.
[+,-]LINE	Connect data points with a line.
[+,-]SYMBOLS	Place symbols at each data point.
[+,-]FIXED	Whether the plots should have fixed ranges.
[+,-]LOG	Whether the data should be log scaled.
[+,-]FLAG	Whether the plots should have a pollution line.
[+,-]GAPS	Create plots with data gaps, instead of connected with line.
[+,-]MVC	Whether the MVC should be printed or filtered out.
[+,-]ZERO	Whether data with zero value should be printed.
[+,-]NEGATIVE	Plot negative data or not.
[+,-]BspG_MIN	Use the default minimum BspG value when computing the albedo.
[+,-]DRAW	Draw CMDL logo when no plot data is present.
[+,-]STATS_HOUT	Whether the hour of the day stats should be calculated.
[+,-]STATS_DAY	Whether the day of the week stats should be calculated.
[+,-]STATS_MONTH	Whether the month of the year stats should be calculated.
[+,-]STATS_QTR	Whether the quarter of the year stats should be calculated.
[+,-]STATS_OUTPUT	Whether the the t-test and rs-test stats should be output."
[+,-]HIST	Whether histogram option is on or not."
[+,-]LOAD	Load data at start up if available."

All of these second types of command line parameters relate to how the graphs are shown. The '+' indicates that the keyword is to be turned on or used, while the '-' indicates that the keyword is to be turned off or not used. Each of these keywords has a default setting which was given in the above listing.

Examples:

```
+fixed All graphs will used fixed Y ranges for the plots.
-log   Graphs will not use log scaling.
```

Most of the second type of options can also be set in a users xshow resource file, ".xshowrc". To create a personal xshow resource file copy the xshowrc file located under the "/aer/prg/idl/xshow_linux/etc" directory to your home directory and name it ".xshowrc". You can then change the options to your liking. Currently the Xshow code is located at "/aer/prg/idl/xshow_linux".

III. The third type of command line parameters are as follows:

```
mode = [1 2 3 4] This sets the plot mode to one of four states.
                The plot mode determines which files to load and also what
                sub-set of plots are available. The default mode is 1 or the
                raw mode.
```

```
1 raw mode      All data is unedited or raw.
2 edit mode     Two panes per plot are used for editing purposes, with the
                first being raw and the second pane being clean.
3 clean mode    All data in edited or clean.
4 average mode  Data is taken from an averaged file.
```

```
points = [number] Set the number of points necessary for a valid averaged data
                point.
```

```
bg = [color index] Set the color index of the plot background.
```

```
1 - Gray
2 - White
10 - Light Blue
```

```
filter = [HEX]   Applies the bit wise filter to plotted data.
```

```
mask = [HEX]     The mask to use when filtering plotted data.
```

Note: filter and mask need to be used together.

Examples:

```
mode = 1 Puts Xshow in the raw plot mode.
```

Notes:

```
There needs to be spaces between the keyword, the '=' and the value.
```


VI. Edit Data:

The Xshow graphical interface provides many features to allow data editing by CMDL scientists. Selecting the "Edit Data" button at the top of the plot window brings up a window containing a list of previous edits for the station and a set of buttons which can be used to do more editing.

1. The "New Edit" button allows you to add a new edit. Clicking on the "New Edit" button brings up a window which allows you to define a time and choose parameters that need to be edited. The 'Year' box is defined to be the year of the data displayed and 'Start DOY' and 'Stop DOY' boxes contain the DOYs of the data currently displayed on the screen. The initials of the person making the edit should be entered in the 'Who' box. 'Notes' is the place to enter an explanation of the edit. If you click on these boxes you can edit them so they contain the information desired. Finally there is a list of possible parameters which can be clicked on if they need to be edited. Once all the options are filled in, clicking on "Apply Edit" will result in the edit being placed in the window containing the list of edits.
2. The "Modify Edit" button allows you to modify an existing edit. In the window containing the list of edits select the edit to be modified by clicking on its number in the far left column. Then click on "Modify Edit". This brings up a window similar to the "New Edit" window described above, although in this case the window will contain the information in the edit line you wish to modify.
3. The "Delete Edit" button allows you to (surprise!) delete an edit. Again, select the edit to be deleted by clicking on its number in the left column and then click on the "Delete Edit" button. The edit should disappear from the edit list.
4. The "Save Edit File" button allows you to save your edits. Click! If you modify the edit file and try to quit Xshow without saving your edits an Error Window will tell you to save the edit file. If you really don't want to save your changes you can exit Xshow by killing the Xshow main window (hit the X on the upper right of the window).
5. The "EditWeek" button runs the Cshell script "editWeek" to applies existing edits to the raw data. So if you are editing a week's worth of data and want to see how it looks so far, you would first click "Save Edit File" and then click "EditWeek" and Xshow apply the edits and recreates the plot so you can see what the edited data look like.
6. The "xt" button allows you to extract a different set of data to be plotted in Xshow. You can choose a different station and different start and end times, as well as different modes of data (e.g., raw, edited, clean, averaged).
7. The "latest" button brings up a window that describes what has been edited for each station.
8. The "Station Log File" brings up the message information in the the station log. For example, it tells you when the span checks or system maintenance were done and/or if there were any problems with the station over the time period being edited.
9. The "Save/Apply" button saves the new edits and applies them to the data, resulting in a new edited plot being generated. If you are editing a week of data you should use the "Save Edit File" and "EditWeek" buttons to apply edits. If you are editing data that is not a weeks worth of data you should use the "Save/Apply" button to see the edits applied.

Appendix B – script documentation

xt

xt [latest=] [output_dir=] [source_dir=] [--cpd2fmt] option [station [here]] [beginYear] beginDoy [endYear] endDoy [file]

latest= specifies that most recent data are extracted
beginYear, beginDoy, endYear, endDoy ignored
xd - extract latest x days
yh - extract latest y hours
zm - extract latest z minutes

output_dir= specify a directory in which to place the
generated file(s). (This overrides the
specification of 'here'.)

source_dir= override the default directory from which to
extract data. When this is specified, xt will
not examine any files outside of this directory.
The user may specify "here" to indicate the
current directory. This option is not compatible
with -x.

[--cpd2fmt] ~ optional Indicates that all output should be to stdout.
(No files should be written.) Also, this
suppresses any non-data output, and causes the output
include both column headings and data-types.

option ~ required -a Will extract all cum files
into X files.

-q Extract from qc cum files

-e Will extract the a_e file
into an X file.

-h Will extract the a_H file
into an X file.

-d Will extract the a_D file
into an X file.

-m Will extract the a_M file
into an X file.

-x Extract from the given file
at the end of commandline

file prefix Will extract all the files
with that 3 character prefix

file prefix list Will extract all the files
with the 3 character prefixes
specified in a comma-delimited
list

aos Will extract SGP AOS data

[station] ~ optional Three character station code

[here] ~ optional If here is given the data will be placed in current directory.

[beginYear] ~ optional Gives the beginning year.

beginDoy ~ required Gives the beginning doy.

[endYear] ~ optional Gives the end year.

endDoy ~ required Gives the end doy

[input file] ~ optional To be used only if code is -x