RED v1.7 --- Variable Cadence

Hale, Steven J.; Miller, Brek A.

BiSON Birmingham Solar-Oscillations Network

TECHNICAL REPORT NO. 225

RED v1.7 — Variable Cadence

Steven J. Hale and Brek A. Miller
The University of Birmingham, Edgbaston, Birmingham B15 2TT

2004 March 19

This technical report series is published by:

THE UNIVERSITY OF BIRMINGHAM

High-Resolution Optical-Spectroscopy Group

School of Physics and Astronomy
The University of Birmingham
Edgbaston, Birmingham B15 2TT, United Kingdom
Telephone: +44-121-414-4551 FAX: +44-121-414-1438

RED v1.7 — Variable Cadence

Steven J. Hale and Brek A. Miller
The University of Birmingham, Edgbaston, Birmingham B15 2TT

2004 March 19

Abstract

New versions of RED and ORANGE are ready. They now allow an optional CADENCE keyword in the control file.

1 Introduction

Work on the Region Editor (RED) began back on 1997 January 10 by Brek A. Miller. The fancy menu system was designed first, then the code to read and handle the data was added. RED first became useful with the addition of the code to perform the daily fit. This version was known as v1.00 and was released on 1998 March 19 for initial trials.

The first step in the process of phasing out ALLFIT and phasing in RED came with RED v1.02. This version included several new features, including the ability to display power spectra and to generate old ALLFIT-style printouts.

RED v1.02 was used to analyze Sutherland data beginning in 1998 May, however delays in producing the residual-generating program ORANGE meant that its use had to be abandoned.

The residual-generating program ORANGE was ready with RED v1.03. We switched from ALLFIT to RED and ORANGE for all data collected after 2000 January 1. In the months that followed the release of RED v1.03, many bugs were found. One of the bugs caused ORANGE v1.03 to calculate the orbital velocity incorrectly.

RED v1.04 included an ORANGE program that could use the JPL ephemeris for calculating the orbital velocity. ORANGE reads the orbital-velocity coefficients from an external EPHEM file [1].

The biggest changes in RED v1.05 were that there was now common source code between RED and ORANGE. However, the ordinary user will only notice the other changes. Starboard

and port flavor information was now written into the control files and ORANGE had an /AFT qualifier.

RED v1.6 changes the fit from a second-order polynomial to a third-order polynomial following advice from Balazs Pinter (unpublished). The order of the fit is noted in the residual file [2]. ORANGE now uses the longer BTR-219 file names for the RES files.

RED v1.7 sees the addition of an optional CADENCE keyword in the control file. This is used for analysing data where the cadence is something other than the 40 second default, for example some older data are available only in 42-second form. At some time in the future we may also want to analyse high-resolution 4-second data, however this will require an additional modification to RED in order to allow for the larger number of points per day.

2 Web Distribution

RED and ORANGE executables are now available on BiSON's internal web pages at:

http://bison.ph.bham.ac.uk/Kipper/Software/Red/

RED and ORANGE are distributed together, however there are two different ZIP files: one for the executables and one for the source code. Right now they are called:

red-1.7-1.zip
red-src-1.7-1.zip

The file *red-*.zip* contains the executables, *red-src-*.zip* contains the source code. The next number (*1.7* in this case) is the version number. Within each version, if any bugs are found then updates have to be released. The release number appears after the dash after the version number.

The general idea is that new features are added in new versions. The individual releases within any given version number introduce only bug fixes.

You should unzip these files using **`pkunzip -d`**. The **`-d`** option tells **pkunzip** to create the directories stored in the ZIP file. Unzip *red-1.7-1.zip* in the root directory; it will create *C:\Bin*. For the source code, you should select an appropriate home directory for the source tree. I use *C:\Usr\Hale\Project*. When you unzip *red-src-1.7-1.zip* it will create a *Red* subdirectory.

3 Using RED

RED is designed to be both easy to use for a beginner, and quick and efficient to use for an expert. Let us look at the steps needed to mark bad regions for the last eleven days of 1998 April for the data from Sutherland.

3.1 Getting Started

The data files for those days must be collected together. Change to the directory containing these data files and convert any DAT files to CMP files if necessary:

```
dat-cmp su98042*, su980430
```

This will convert all of the days from 1998 April 20 up to and including April 30. Then invoke RED with these days:

```
red su98042*, su980430
```

Notice how RED, like **dat-cmp**, allows you to specify more than one file. You should separate file names with commas. The wildcard characters `*` and `?` may be used in the ordinary DOS fashion.

The above command will start RED. It will immediately begin loading the file *su980420.cmp*. Once this is finished, RED will plot the ratios and sums from the starboard and port detectors using the colors shown in Table 1. The scale across the bottom of the display is the time of day (in hours UT), the scale on the left edge of the display is the ratio (as a percentage).

Table 1: RED Colors

Value	*Color*
Starboard Ratio	Red
Port Ratio	Blue
Starboard Sum	Yellow
Port Sum	Green
Residuals	Red
Spectrum	Green

The sum is drawn over the ratio so that zero sum and zero ratio are plotted vertically at the same place. The sum is scaled so that it fits within the display. The upper and lower limits of the sum scale are shown at the top-left and bottom-left corners of the display.

You will notice that several areas of the day appear to be highlighted. These are the bad regions that are already defined for this day. There is a number centered at the top of each region, this is the reason code for that region. We use reason codes to keep track of why each region of data is bad. For example, code 1 means bad weather. You will probably see one or more regions marked with code 6. These areas are data collected with the beam chopper activated.

A list of the current reason codes can be found in Table 2. The list is quite extensive — there are a lot of different things that go wrong with our stations. Perhaps codes 83 and 85 (sky writing and Mercedes Benz commercial) are the most interesting. These could only happen to our Mount Wilson station in California.

Table 2: Reason Codes

Reason Code	*Reason for Bad Data*
1	Weather
2	Unknown
3	Unavailable
4	Unknown (day missing)
5	Unknown (data missing)
6	Chopper
10	Sunrise
11	Sunset
12	Changeover
13	Operator
14	BISON Work
15	Hard Disk Full
16	Floppy Disk Full
17	Power Failure
18	Coelostat Shadow
19	Closed
20	Clive Scalers
21	Dome Stuck
22	Hard-Disk Failure
23	Unknown (LA9306 problem)
24	Loose-lid wiggles
25	IEEE Cable
26	Bad weather missing
27	Refrigerator
28	Direct Photograph
29	Sunset Vignetting
30	HD Write Error

Table 2 (Continued): Reason Codes

Reason Code	*Reason for Bad Data*
31	Keithley Failure
32	Anomalous Wind Trips
33	Drive B: Problem
34	Slew Motor
35	Disk Error
36	DEC Limit Switch
37	CA9307 Problem
38	Wiggles/Noise
39	Shutter Encoder
40	PEM Problem
41	Shutter Switch
42	IEEE Problem
43	Obstruction
44	Building Shadow
45	GPS Fault
46	Eclipse
47	Shadow
48	Tracking Motor Failure
49	Autoguider
50	Mount Stuck
51	FD Write Error
52	Timing Problem
53	Pockels Cell Failure
54	DEC Stepper
55	HP DMM Problem
56	ASP 1-Hour Delay
57	Bad Cadence
58	Chopper/Autoguider Problem
59	Detector
60	Loose shaft coupler

Table 2 (Continued): Reason Codes

Reason Code	*Reason for Bad Data*
61	CMOS Problem
62	Oven Power Supply
63	Cold weather
64	Mirror realuminizing
65	Temperature-Controller Failure
66	Computer stuck
67	Spectrometer Cover
68	Rotated cell
69	Compacting Problem
70	Dome Problem
71	Cables Caught
72	Step
73	Bad Oscillation
74	Shutter Problem
75	V/F Problem
76	Power Supply
77	Floppy Disk Problem
78	Cloud Detector
79	Fuse
80	Alignment
81	Loose Cable
82	Cleaning
83	Sky Writing
84	Water Loop
85	Mercedes Benz Commercial
86	Birds
87	Weather or Autoguider
88	Rain Detector
89	RCD Trip
90	Dead I/O Card
91	Blind Motor

It is not necessary to understand all of these codes. In fact, it really is not necessary to understand any of them. The basic analysis does not depend on these codes. They will only be used by the program that generates station-performance statistics. For now, all regions of bad data can be marked as code 1 for bad weather. I will go through the control files, amending the reason codes as necessary, at a later date.

If you look at the bottom of the screen you will see the status line. It should be telling you to "`Click on beginning of bad region or select command from menus`". Now is probably a good time to be sure the mouse is working. Move the mouse around, you should see a small pair of crosshairs moving around the screen. If you do not, perhaps the mouse driver is not loaded. In this case, press **X** to return to the DOS prompt, type **mouse** to load the mouse driver, and then restart RED.

Let us try to add a new bad region. 1998 April 20 is not a particularly good day for Sutherland. Let us try to add a bad region beginning at about 7 hr UT and ending at 8.5 hr UT. Use the mouse to position the crosshairs within the plotting area at a point near the left of the bad region, in this case at about 7 hr. Press and release the left mouse button.

The status line should now beckon, "`(RC=1) Bad region from 6.856 hr to <click on endpoint>`". The RC value at the beginning of the line tells you that you are adding a region with code 1 for bad weather.

Move the mouse to the right edge of the bad region and press and release the left mouse button. A new highlighted region should be added to the display.

Perhaps half of your time will be spent adding regions in this manner, so we have already mastered half of what we need to know. The rest of the time will be spent selecting and executing commands from the menu system. So we had better see how that works next.

3.2 Selecting Commands from the Menus

The menu system was designed to work in a similar fashion to the Microsoft Windows menu system. There are several ways to select commands from the menus, you should try them all and decide which way works the best for you. Let us look at the slowest way first. As an example, we will try to delete one of the bad regions we defined earlier.

The Delete Region command appears on the Edit menu. Use the mouse to position the crosshairs over the word Edit in the menu bar across the top of the screen. Press and release the left mouse button; the Edit menu will open and the top item will be highlighted. Position the crosshairs over the Delete Region item. Press and release the left mouse button; the menus will disappear and the status line will say, "`Select region to delete`." Use the mouse to position the crosshairs over the region you would like to delete. Press and release the left mouse button; the region should disappear. If you mistakenly click on an area where there is no region, the status line will say, "`There is no region at 8.234 hr`."

Another way to select the same command from the menu system is as follows. Use the mouse to position the crosshairs over the word Edit in the menu bar across the top of the screen. Press

and hold the left mouse button; the Edit menu will open, no items will be highlighted. Using the mouse, move the crosshairs until they are positioned over the Delete Region item; that item will become highlighted. Release the left mouse button and the command will execute as before.

A faster way to select commands from the menu system is to use the keyboard. Press `ALT/E` (that is, hold down the `ALT` key and press the `E` key); the Edit menu will open and the top item will be highlighted. Press the `DOWN` (down arrow) key until Delete Region is highlighted, then press `RETURN`. The command will execute as before.

An even faster way to select commands from the menu system is to type the short-cut key directly. When you ran Delete Region earlier, you may have noticed that the letter `D` appeared in the menu just to the right of the words *Delete Region*. This is to let you know that the short-cut key for Delete Region is `D`. Press the `D` key and the command will execute as before.

Now we know how to select commands from the menus. From here on, instead of saying something like, "Select Delete Region from the Edit menu," we will say, "Run the Edit | Delete-Region command," giving both the menu name and the command name together in a nice, compact form.

3.3 Modes of Operation

Looking at the ratio and sum is probably the best way to work out where there is bad weather. But it is still necessary to see what the residuals will look like before making a final decision as to where the bad regions should be. In addition to the ratio and sum, RED allows you to look at the residuals and the power spectrum.

To view the residual velocities for the current day, use Mode | Fit. To look at a power spectrum, use Mode | Power-Spectrum. You should probably return to the ratio-and-sum display before trying to edit the region information, use Mode | Edit to do that.

3.4 More About Regions

After you initially mark the areas of bad weather in *edit mode*, you should examine the residuals in *fit mode*. At this point, you will probably decide that the original regions you chose are not quite right. RED makes it easy to change the locations of the regions.

Let us suppose that you have decided that one of your regions is too small and needs to be extended to the right. First return to the *edit mode* using Mode | Edit so that you can see where the regions are. Using the mouse, position the crosshairs somewhere within the region to be enlarged. Press and release the left mouse button. RED is now waiting for you to select the right edge of the new region. Move the crosshairs to the right to the appropriate point. Press and release the left mouse button again. The new region will be drawn on the screen.

We have seen that making regions larger is an easy thing to do. Making them smaller is not quite so easy. In this case it is necessary to delete the old region using Edit | Delete-Region first,

and then add a new, smaller region in its place. Because of this, it is probably a good idea to make the region slightly too small in the first place, and then slowly make it bigger and bigger until everything is how you want it.

The areas at the beginning and end of the day pose a special problem. RED uses a special code to keep track of areas where there is no data. If the fitting code tries to generate residuals for any data containing this special no-data code, the results will be wildly inaccurate. You must make sure that all areas with no data are marked by bad regions.

This is not as hard as you might think. When RED first reads the data for a day, it goes through the data checking for areas with no data and adds regions appropriately. But keep in mind that if you delete one of these regions, you will have to put it back before you use either the Mode | Fit or Mode | Power-Spectrum commands.

A special technique is needed to cover the areas at the beginning and the end of each day. To add a region that extends all the way to the left edge of the plot, use the mouse to click on some area of the screen *outside* the plot window to the left. Similarly, to add a region that extends all the way to the right edge of the plot, click somewhere *outside* the plot window on the right.

Someday perhaps RED will be able to fix things up itself when you delete regions covering areas with no data.

3.5 Printing Temporary Plots

It is easy to generate ALLFIT-style temporary plots. All you have to do is use the Print | Old-ALLFIT-Style command. When you do this the status line will say something like, "`Printing SU980420.PS... done.`" RED will write the plot to a PostScript file that you can later send to the printer using the **lpr** command.

The only confusing thing is that RED will try not to overwrite any existing plots. It does this by trying to be cleaver about choosing the specification for the plot file. The name will always be the same as the name of the data file, in this example *su980420*. RED would like to make the type *.ps* to indicate that the file is a PostScript file. However, if *su980420.ps* already exists, RED will instead try *su980420.ps1*. If that exists, RED will try *.ps2* and so on up to *.ps9*. After that RED tries *.psa* to *.psz*. If all of those names are taken, RED will simply overwrite the file with the type *.psz*. You should not keep that many PostScript files anyway.

Check the status line when you use Print | Old-ALLFIT-Style to see what name RED has chosen for the PostScript file.

3.6 Changing to Other Data Files

Once you have completed work on the data from one day, you will want to move on to other days. There are three commands for changing days: File | Next, File | Previous, and File | List.

Normally you should finish work on one day and then use File | Next to move on to the next day. RED will tell you when there are no more days left.

RED makes a list of all the data files you asked for when you start the program. There will always be at least one file in the list, but there may be many more. In our example we typed **`red su98042*, su980430`**, which would make a list of eleven files, assuming that all eleven data files were actually present in the current directory when RED started. File | Next and File | Previous will allow you to step through this list in both directions.

Sometimes the list can be quite large and stepping through it one file at a time is very slow. If you use File | List, RED will open a small window to show you the full list of files. Use the `UP` and `DOWN` arrows to move through the list and press `RETURN` when the file you want is highlighted. The list may be longer than will fit within the window, you may use `PAGE_UP` and `PAGE_DOWN` to move up and down by pages.

The general idea is to tell RED which files you would like to edit when you start the program. The example, **`red su98042*, su980430`** told RED that we only wanted to look at the last eleven days of 1998 April. Using **`red *`** will tell RED that we may want to look at *all* of the data files in the current directory. You could then select the individual files you want using File | List. However, RED is limited to a list of only 500 files. If your selection covers more that 500 files, RED will give up. If this happens, you will need to be more specific in choosing the files names you put on the command line. No one should every try to work on more than 500 files at one time anyway.

3.7 The End of the Game

When you are finished working with RED, use the File | Exit command to end the program.

4 RED Commands

This section contains descriptions for all of the RED commands.

File | Next Move to the next file in the list, saving any changes if necessary.

File | Previous Move to the previous file in the list, saving any changes if necessary.

File | List Display the list of files in a window and allow the user to choose which file to read next. Changes to the old file are saved if necessary.

File | Reread Reread the current file, discarding any changes that have been made.

File | Abort End the program, discarding any changes that have been made.

File | Exit End the program, saving any changes if necessary.

Mode | Edit Change to *edit mode* where the ratio and sum are displayed. The user may use the editing commands in this mode.

Mode | Fit Change to *fit mode* where the residual velocities are displayed. The user may use the editing commands in this mode, but it is not as easy as using them in Edit mode.

Mode | Power-Spectrum
Change to *spectrum mode* where the power spectrum is displayed. The user may not do any editing in this mode.

Edit | Add-Region
Add a bad region to the list of regions. Using this command is not required. The user may add regions in Edit mode simply by clicking on the edges.

Edit | Delete-Region
Deletes a region from the list.

Edit | Add-Breakpoint
Add a breakpoint to the list of breakpoints. The fitting code performs separate fits for the areas of data between breakpoints. A breakpoint is necessary, for example, in Mount Wilson data at noon when the primary mirror has been moved.

Edit | Delete-Breakpoint
Delete a breakpoint from the list.

Edit | Reason-Code
Change the reason code to be applied to all new regions added.

Edit | Change-Code
Change the reason code for one existing region. The user will be asked to point to the region and then will be asked for the new code.

Edit | Change-Cadence
Change the cadence for this day of data. The day will then be reloaded. Any existing regions created with the previous cadence will have to be checked and possibly adjusted.

Print | Old-ALLFIT-Style
Output an old ALLFIT-style PostScript file containing a plot of the data for the current day.

Print | Data-Only
This command is not yet implemented.

Print | Data+Residuals
Output a PostScript file containing a plot of the ratio, sum, and residuals for the current day.

Print | Spectrum

This command is not yet implemented.

Settings | Fit-Settings

This command is not yet implemented.

Settings | Display-Settings

Change the settings controlling which data are plotted in *edit mode*. You may select between starboard, port, fore, aft, Delta-B, magnetic, scattered, and transmitted data, including various means and differences.

A RED Revision History

[RED v1.00; 1998 March 19]

Original Version
The first release of RED had a fancy menu system, could edit regions, and could fit the data.

[RED v1.01; 1998 March 24]

Printing
The user can now write out PostScript plots of the data and residuals.

Bug Fixes
Data files are now closed. This oversight was causing DOS too-many-files-open errors. The default display settings are now reasonable.

[RED v1.02; 1998 April 29]

Power Spectrum Display
A power spectrum is now displayed in *spectrum mode*.

Edit | Add-Region Command
A new item on the Edit menu. More help messages.

/LOCK
Added /LOCK qualifier to keep people from messing things up.

File | Reread Command
A command to re-read the current day, discarding any changes to the control information.

Initial Regions
The program now initially mark areas with no data, or with chopper data, as bad.

Print | Old-ALLFIT-Style
Print old ALLFIT-style pages.

Regions in Fit Mode
An advanced user can now add and remove regions while looking at the residuals in *fit mode*.

Bug Fixes
Limits on reason codes. Field-width problem for add-region display fixed.

[RED v1.03; 2000 January 1]

Intelligent Redraw
RED now decides for itself when to redraw the screen after a region is added.

Better Autoscaling
RED now correctly scales the ratio and sum display, for the Print | Old-ALLFIT-Style command.

Safe Spectrum
The power spectrum code now does not crash on bad days where there is no data to transform.

ORANGE — Output Residuals
A separate program to generate residual files.

Safe Printing
RED now does not crash if you try to print a day with no good data.

[RED v1.04; 2000 September 15]

JPL Ephemeris
Code added to the RESID module to look-up the orbital data in ephemeris files rather than calculate it itself.

Starboard/Port
/STARBOARD and /PORT have been added to ORANGE to force it to use only one detector.

[RED v1.05; 2001 May 31]

Flavor Control
Starboard/Port flavor information is now stored in the control files.

Fore/Aft
/AFT has been added to ORANGE to force it to use the aft cell.

Common Source
RED and ORANGE now use the same source code for the common functions.

[RED v1.6; 2003 January 8]

NPOLY4
NPOLY changed from 3 to 4 for third order fit.

[RED v1.7; 2004 March 17]

CADENCE
Optional CADENCE keyword is now allowed in the control files.

B RED Command Line

RED

Invokes the HiROS Region EDitor to modify control files.

Format:

RED ***input-spec***[**,...**]

Parameters

input-spec

Specifies one or more data files as input. If you specify more than one file name, separate them with commas. If you specify the type, it must be CMP as RED can, at present, only read CMP files. If you do not specify the drive or directory, the current drive and directory are used. Wildcards are allowed in the file specification.

Qualifiers

/CONTROL_DIR

/CONTROL_DIR=*directory-spec*
/NOCONTROL_DIR (Default)

Allows the user to specify the directory in which control files are stored. This program uses the following method to determine the locations for control files:

1) The value of the /CONTROL_DIR qualifier.
2) The value of the CONTROL_DIR environment variable.
3) The value "C:\RESULTS\CONTROL\".

A backslash (\) is appended to the value if it is not already present.

/DEBUG

/DEBUG=(*flag-spec*[,...**])**

Allows the user to specify the debugging level for various parts of the main program. *flag-spec* should be of the form *flag=value*. The following flags are defined:

EPHEM	The ephemeris code.
RESID	The fitting code.
SPECTRUM	The power-spectrum code.

By default, each flag is set to zero. If a flag is present in the list but no value is specified, the value one is used. You may negate each flag by prefixing it with "NO", this will set the flag to zero.

In general, the higher the debugging level, the more debugging information that will be displayed. Consult the source code to see exactly what will be printed for each level.

If you specify only one *flag-spec*, you may omit the parentheses.

/EXECUTABLE

/EXECUTABLE=*exe-spec*

Allows the user to specify the executable file to use for the main program. By default, the name of the executable file will be REDM.EXE. The main program need not be an EXE file, you may specify COM or BAT as the type.

This front-end program searches for the main program in the current directory and then in the directory in which the front-end program is located. If you specify a drive or directory in *exe-spec*, then only the specified directory will be searched.

This qualifier is meant to be used by the software maintainer to test the program. The user should have no need to change the name of the main program. Calling a main program from the wrong front-end program may have unexpected results.

/LOCK

/LOCK (Default)
/NOLOCK

Specifies whether the control files are to be write-locked. By default, the control files are write-locked. This allows the user to examine data files, possibly changing the region information, while not interfering with the valuable information stored in the control files.

When RED is being used to modify the control files, use the /NOLOCK qualifier.

C ORANGE Command Line

ORANGE

Invokes the HiROS Output-Residuals program to generate residuals files from data files.

Format:

ORANGE ***input-spec***[,...] [***output-dir***]

Parameters

input-spec

Specifies one or more data files as input. If you specify more than one file name, separate them with commas. If you specify the type, it must be CMP as ORANGE can, at present, only read CMP files. If you do not specify the drive or directory, the current drive and directory are used. Wildcards are allowed in the file specification.

output-dir

Specifies the drive and directory to which the residual files are to be written. If you omit this parameter, residual files will be written to the current directory. Any name or type specified in output-dir will be ignored. ORANGE determines the name of the residual file based on the station and date. The type is always RES. Any existing residual file with the same name will be overwritten.

Qualifiers

/AFT

/AFT
/NOAFT (Default)

Specifies that data from the aft cell are to be used instead of data from the forward cell.

/CONTROL_DIR

/CONTROL_DIR=*directory-spec*
/NOCONTROL_DIR (Default)

Allows the user to specify the directory in which control files are stored. This program uses the following method to determine the locations for control files:

1) The value of the /CONTROL_DIR qualifier.
2) The value of the CONTROL_DIR environment variable.
3) The value "C:\RESULTS\CONTROL'.

A backslash (\) is appended to the value if it is not already present.

/DEBUG

/DEBUG=(*flag-spec*[,...])

Allows the user to specify the debugging level for various parts of the main program. *flag-spec* should be of the form *flag=value*. The following flags are defined:

EPHEM	The ephemeris code.
RESID	The fitting code.

By default, each flag is set to zero. If a flag is present in the list but no value is specified, the value one is used. You may negate each flag by prefixing it with "NO", this will set the flag to zero.

In general, the higher the debugging level, the more debugging information that will be displayed. Consult the source code to see exactly what will be printed for each level.

If you specify only one *flag-spec*, you may omit the parentheses.

/EPHEM_DIR

/EPHEM_DIR=*directory-spec*
/NOEPHEM_DIR (Default)

Allows the user to specify the directory in which ephemeris files are stored. This program uses the following method to determine the locations for control files:

1) The value of the /EPHEM_DIR qualifier. 2) The value of the EPHEM_DIR environment variable. 3) The value "C:\RESULTS\EPHEM'.

A backslash (\) is appended to the value if it is not already present.

/EXECUTABLE

/EXECUTABLE=*exe-spec*

Allows the user to specify the executable file to use for the main program. By default, the name of the executable file will be ORANGEM.EXE. The main program need not be an EXE file, you may specify COM or BAT as the type.

This front-end program searches for the main program in the current directory and then in the directory in which the front-end program is located. If you specify a drive or directory in exe-spec, then only the specified directory will be searched.

This qualifier is meant to be used by the software maintainer to test the program. The user should have no need to change the name of the main program. Calling a main program from the wrong front-end program may have unexpected results.

/JPL

/JPL (Default)
/NOJPL

Specifies that the JPL ephemeris should be used to calculate the orbital velocity. This is the default behavior and is more accurate than the Duffett-Smith method of calculating the orbital velocity. However, the JPL coefficients are read from an external file. If that file is not present, use /NOJPL to calculate the coefficients internally.

/PORT

/PORT
/NOPORT (Default)

Specifies that only data from the port detector are to be processed. /STARBOARD takes precedence over /PORT.

/STARBOARD

/STARBOARD
/NOSTARBOARD (Default)

Specifies that only data from the starboard detector are to be processed. /STARBOARD takes precedence over /PORT.

References

[1] Brek A. Miller. ALLFIT and RED ephemeris files. *BISON Technical Report Series,* Number 151, High-Resolution Optical-Spectroscopy Group, Birmingham, United Kingdom, September 2000.

[2] John Allison, William J. Chaplin, Yvonne Elsworth, Steven Hale, and Brek A. Miller. BiSON data-file formats. *BISON Technical Report Series,* Number 219, High-Resolution Optical-Spectroscopy Group, Birmingham, United Kingdom, November 2003.