3.0 TAB

In order to analyze the data retrieved from the Fairborn Observatory's Robotic telescope, I wrote several programs to view the data. These programs can be found on the accompanying disk under the directory \EXE. Also an the disk in the directory \TAB, is Bob Hogan's program TAB2 which generates data tables from the binary file DAT.DAT.

3.1 Generating Data Tables with TAB

The program TAB2 is designed to use the data in the binary file DAT.DAT to produce tables of the data. The program requires that two data files are in the current directory: REFSTAR.TBL and CATALOG.TBL. If they are not there, TAB2 will crash. REFSTAR contains the list of the reference star for each group. CATALOG contains the current RA and DEC, magnitude, color index, and E (which is something to do with being a variable star?). Also, TAB2 requires that DAT.DAT be in the current directory. The best way to explain tab is show two examples of generating tables:

EXAMPLE 1:
Generate a Color Table and a Night Table for HD 114762

```
DRIVE>TAB2

  file
  days
  stars
  extinction
  coefficients
* outliers
  color
  night
  show
  save
  print
  quit

>days 1 500                ! Set the date range for finding data

>color 114862              ! make a color table for the star
                           ! **  Working ** for a long time
>show                      ! view the table created
   **  lots of data **
>save 114762.clr           ! save in the file "114762.CLR"

>night 114762              ! generate a night table
                           ! Wait awhile -- the bigger the DAT.DAT the
                           longer
```

```
>show                          ! Display table
                               ! the night command saves the data for you.
   ** lots of data **
>quit                          ! Exit to DOS

DRIVE>DIR 114762.*             ! See what you have created.

114762   CLR    162606 09-13-91  10:58p ! File size may be different
114762   NIT      8938 09-13-91  11:18p
114762   PLT      8282 09-13-91  11:18p ! This is a NIT file without a
                                        !       header
        3 file(s)     179826 bytes

DRIVE>                         ! Your done
```

EXAMPLE 2: Generate night tables for all stars.

```
DRIVE>TAB2                     ! Run tab2

>days 1 500                    ! Select JD range

>night *                       ! Create night tables for all stars
                               ! Let run overnight
>quit                          ! Back to DOS
```

This version of TAB does not allow you do what is in example 2 with Color Tables so you will want to use I/O redirection to run a large batch of color tables over night like this:

```
Copy con:redirect.dat
days 1 500
color 1642
save 001642.clr      ! always make sure the number here is 6 characters
  ...
  ...                ! repeat as many times as needed
color 300000
save 300000.clr
quit
^Z
TAB2 <redirect.dat
```

3.2 Tab Instruction List

1) DAYS Define the days that will be considered; firstday, lastday
2) STARS NOT USED
3) EXTINCTION Allows the user to specify the extinction coeff.
4) RATIO star HD #
5)NIGHT compute the nightly mean for those periods when the extinction coeff was calculated
6) SHOW shows the results on the screen
7) SAVE Saves the table to a file specified by the user
8) QUIT quit the program

4.0 PLOT-NIT

4.1 Looking at Night to Night Tables

- Night Table -

Now that the tables are created, it is possible to view them. To view the night table, use the program "PLOT-NIT". There are three files required for this program to run: the NIT file, your table; "TMSRB.FON", the data file for graphics text; and "SAVE.LST" a file you have to create yourself. The file "SAVE.LST" is very important. You put in it a list of the file names of the tables you wish to inspect. Each line contains the line of the complete file name of one table. Here is a quick way to make the file:

```
DRIVE>copy con:save.lst
114762.nit      <enter>
^Z                              ! Hold down <CTRL> and press Z
DRIVE>
```

If you want to view several files at a time, just add each one to a line in this file. You can also use any text editor to make this file.

Once you have done this you are ready to view the night table. Start the program:

```
DRIVE>plot-nit
The current ranging parameters are:       ! controls the range of plot.
   Minimum: 0.10 Mag                      ! default settings
   Maximum: Range of points.
 Do you like these (y/n):
```

These are the range of the magnitudes displayed. The current settings force the program to have the Y-axis scale show a change of 0.10 magnitude. If you wish to have all your graphs have the same scale, type "n" and <enter>. Then put in the same value for both the maximum and minimum values. If you like the values enter "y" <enter> or just <enter>.

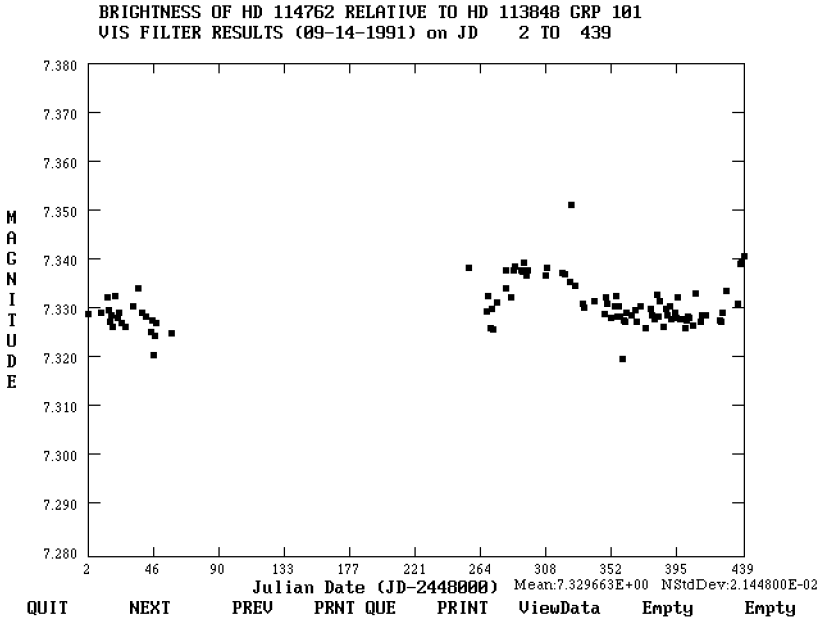
```
The current filter to plot is:
     filter 3 - VISUAL
Do you like this(y/n):
```

Type "y" <enter> or just <enter> if you want this filter to be graphed. Otherwise, to change filters, type "n" <enter>. You will then be asked the number of the filter you want.

Next you will be asked if you want error bars. The error bars are taken from the % error list in the NIT table for the filter. Just pressing <enter> is the same as "y" <enter>.

Finally, you are asked if you want outliers marked. This function does two things: it shows where the mean value is on the right hand side and it marks points that are outside of one sigma. The outliers are marked with a yellow circle. It was put in for the purpose of drawing attention to points near the top and bottom of the graph, as they can often go unnoticed. Pressing <enter> is the same as "y" <enter>.

Here is a sample of what you will see:



The Graph Explained

The top line of the graph's header contains the information on what the data is being viewed. The second line says the filter plotted, the date the table was made and the Julian Dates (-244800) that this data covers. On the bottom, after the X-Axis label, there are two numbers labeled "Mean" and "NStdDev". The "mean" number is the mean value of the points plotted. The "NStdDev" is the normalized standard deviation of the points.

The bottom line of text on the screen is the command menu. Use the left and right arrow keys to move across the menu and <enter> to select an option. The options are: "QUIT" or <esc>, exit to DOS; "NEXT", go to the next table listed in SAVE.LST; "PREV", go to the previous table in SAVE.LST; "PRNT QUE", saves the table name (see BATCH PRINTING); "PRINT", print the graph on the printer(must be an HP LaserPrinter or DeskJet), "ViewData", displays the table used to make the current graph; and "Empty", does nothing. The viewdata command requires a program called BROWSE.COM. To quit viewing a table, press <esc>. If you do not have it, a substitute can be made:

```
DRIVE>copy con:browse.bat
@echo off
type %1 | more
pause
^Z                          ! This is hold down <Ctrl> and press Z
DRIVE>
```

5.0 PLOT-CLR

5.1 Looking at Within Night Tables

- Color Table -

The program used to view within night data is "PLOT-CLR." Before you read this section, please read "Looking at Night to Night Tables." The two programs are very similar and use much of the same source code. Only the things that are very different are explained.

First, the required files: TMSRB.FON, graphics fonts; DDIR.COM, a directory displayed; BROWSE.COM, the data viewer; *.CLR, the within night table; *.BIN, the binary version of *.CLR; *.PTS, and the number of data points in *.BIN. The *.BIN and *.PTS files are created with the program "PACKDATA." This was done to allow moving around from night to night at a reasonable speed. An example of how to run the program for the file 114762.CLR:

```
DRIVE>packdata
114762
DRIVE>
```

Then run the graphing program.

```
DRIVE>plot-clr
```

When the program begins, the major change is that you will see:

```
Press Enter if you are using a new file:
(Otherwise press anything else.)
```

If you press enter, the program will give you a list of color tables that you may view. It will then copy the file to a binary format in a temporary file. If you pressed any other key, the program will display a list of binary color tables to view. The program will then ask you to enter the HD number of the file you wish to view. It is recommended that you do not use the temporary binary method, because you must regenerate the binary every time you wish to view a color table. This can take a long time for large color tables.

The only change when the graph is displayed is that there is a new menu item: "GOTO NIGHT." This option allows you to go directly any JD you wish. If it does no find it or if it has only one point, it will simply put you back at the first night. BUGS: the previous command does not work from the first night. To use it, goto the NEXT night then goto the PREV night and you will be put at the last night in the data set.

6.0 PLOTTING

6.1 Batch Printing of Graphs

Batch printing of graphs can be accomplished with the program "IIP-N." Simply put at list of files to print in the file "SAVE.LST." It will take these and plot them. It handles NIT files and CLR files that contain only one day. The program PLOT2 can be used to generate the file. The menu command "PRNT QUE" puts the view file's name into a file name "PLOT.LST." T batch print the selected graphs, rename the PLOT.LST to SAVE.LST and run IIP-N as follows:

```
DRIVER>ren plot.lst save.lst
DRIVER>iip-n
```

6.2 CLR File

This file contains a text table of within night data for a particular star. It may hold anywhere from one to hundreds of nights of data each with a number of samples. The first line of the file will state: " - Color Table - ". The third line says the star's HD number, the date the table was created, the group the star belongs to, and the star to which this star is referenced. The fifth line explains each of the columns of data. Julian Date is the actual date minus 2448000.

6.3 NIT File

A file containing a text table of the night to night data for a particular star. The table contains one point for each night in each filter. Each line is that mean value for that particular night. The table is titled " - Night Table - ". The third line is the same as in the CLR file.