

This program allow you to measure as easy as possible Af[rho] (1) quantity. You can retrieve this program at URL cara.uai.it in tools page of this site.

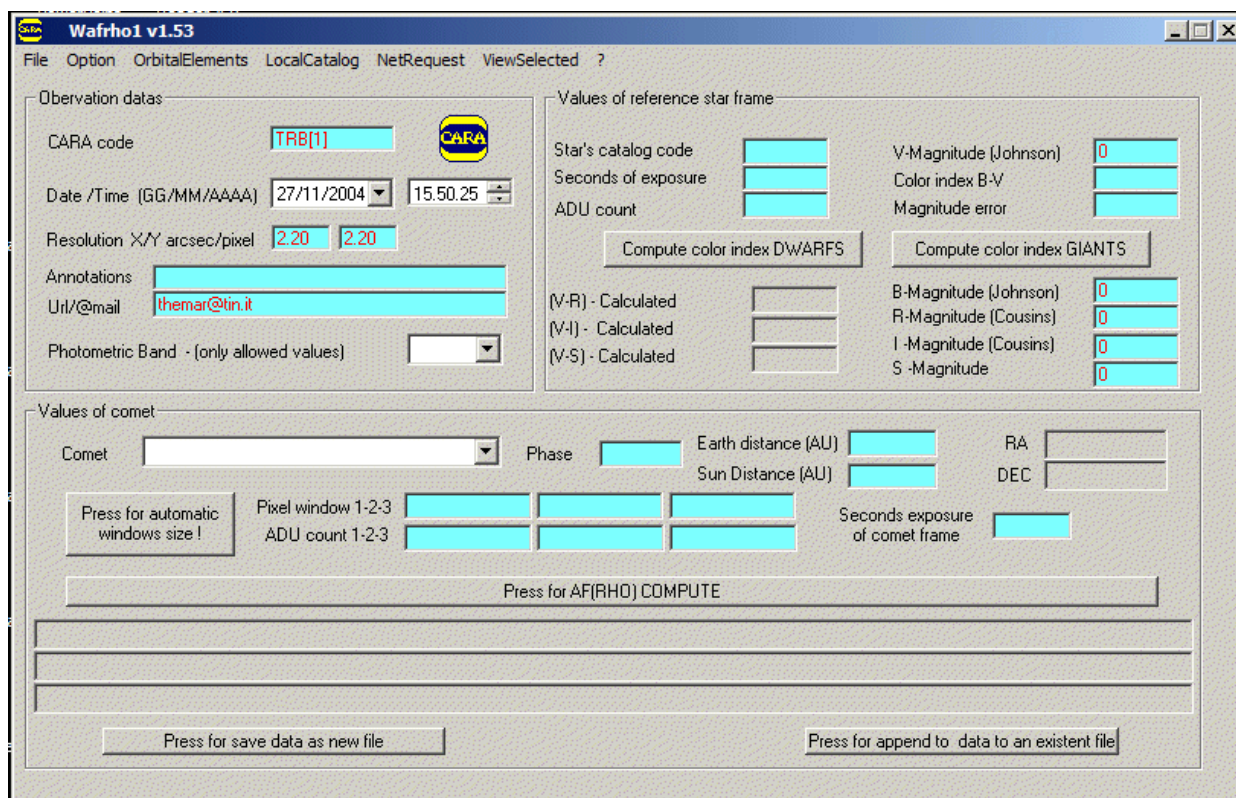
Requirements are :

- * PC 100% compatible.
- * CPU 486 DX minimum.
- * Memory 8 Mbytes minimum.
- * 5 Mbytes of free hard disk space.
- * Operating system : Windows 9X/ME/XP(tm).
- * Mouse or equivalent pointing device.

The pakage is distributed as zip file. You can un-zip it in a temporary folder and run setup program. In the folder where you have installed the program you will find four files :

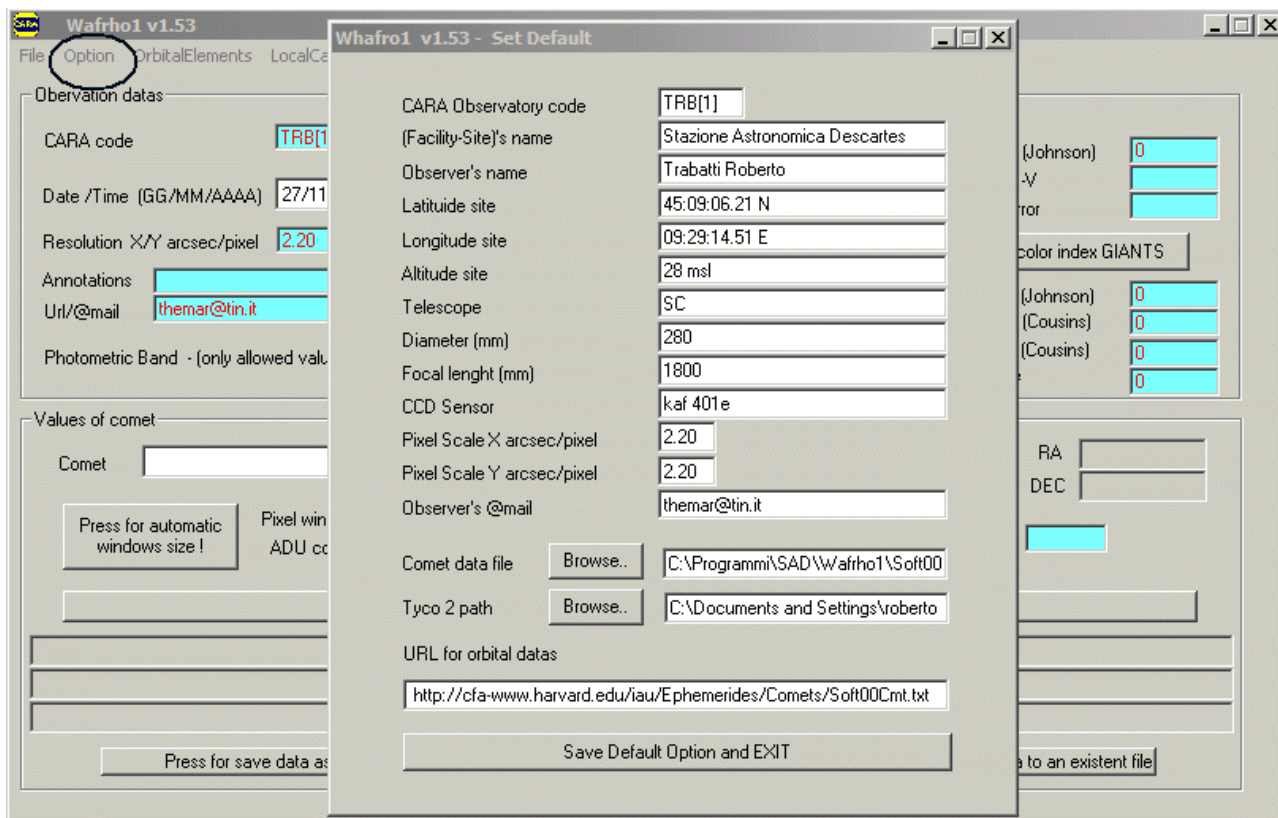
- * Wafrho1.exe : The program
- * License.txt : License (disclaimer agreement -sigh!-)
- * Readme.txt : Some notes on the last version.
- * Soft00Cmt.txt :The sample of MPC comet's orbital data file.

You must check that your system have in a path a folder named "WINDOWS". If you have not it please make it! If you open Wafrho1.exe you must see on your monitor the "main panel" window :



Pic.1 The **main panel** window.

Your very first operation is to define in the program your **Observatory Card** . You can do it clicking the **option** menu. Please take agreements with CARA data base administrator (his mail indexes are at URL cara.uai.it) for your observatory code. The usual form is XXX[n].



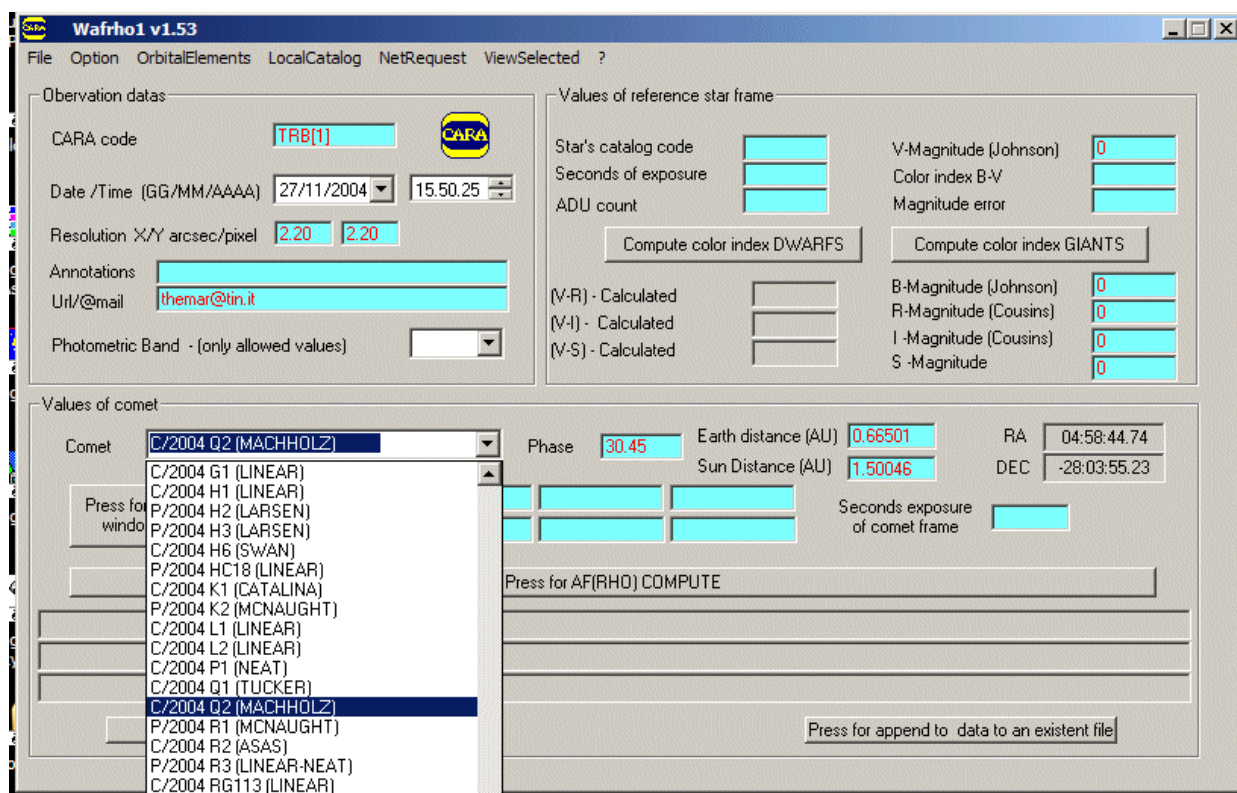
Pic.2 The **default values** window.

Mandatory input data are :

- * Observatory code.
- * The arcsec pixel scale X/Y of your telescope/CCD system.
- * The folder where the program can find the comet's orbital data file and its name.

Without these data the program don't run. When you save the input data the program returns to the main panel. You can see that some input fields of main panel take data from default values. You can change it in main panel , but you can always restore the default values with the item refresh defaults of **option menu**. If you need, you can see the default values in the file Wafrho15.ini at WINDOWS folder. Please do not edit it! At least you can delete it and remade it with the program itself.

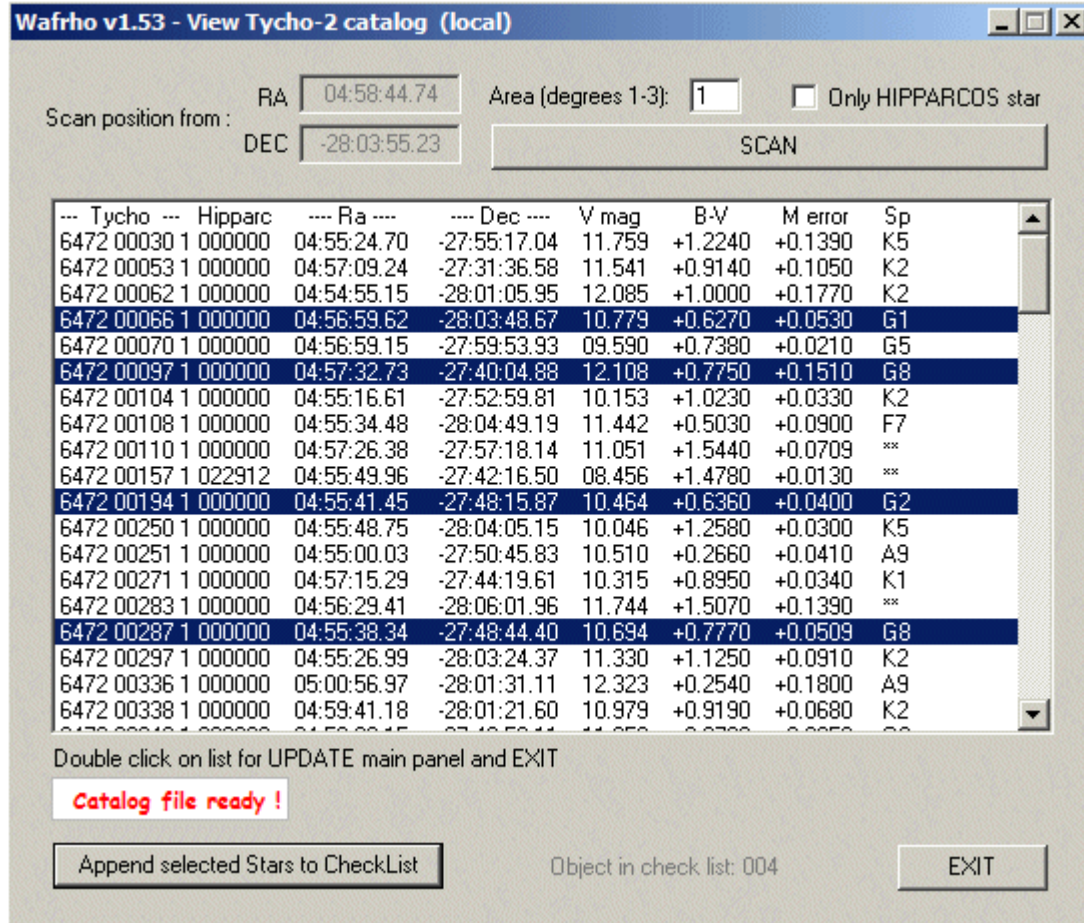
Now you are ready to perform your measurements. Set the correct date and time of observation. Choose among the comets shown in the combo box. The program automatically computes the position of comet in the sky, phase angle and its Earth distance and Sun distance.



Pic.3 Choose the comet from combo box.

Now you must select the filter band (2)(3) of your observation. The next step will be the reference stars(4) measurement. You have several mode to choose reference star values (at least if you know them you can simply input them manually!).

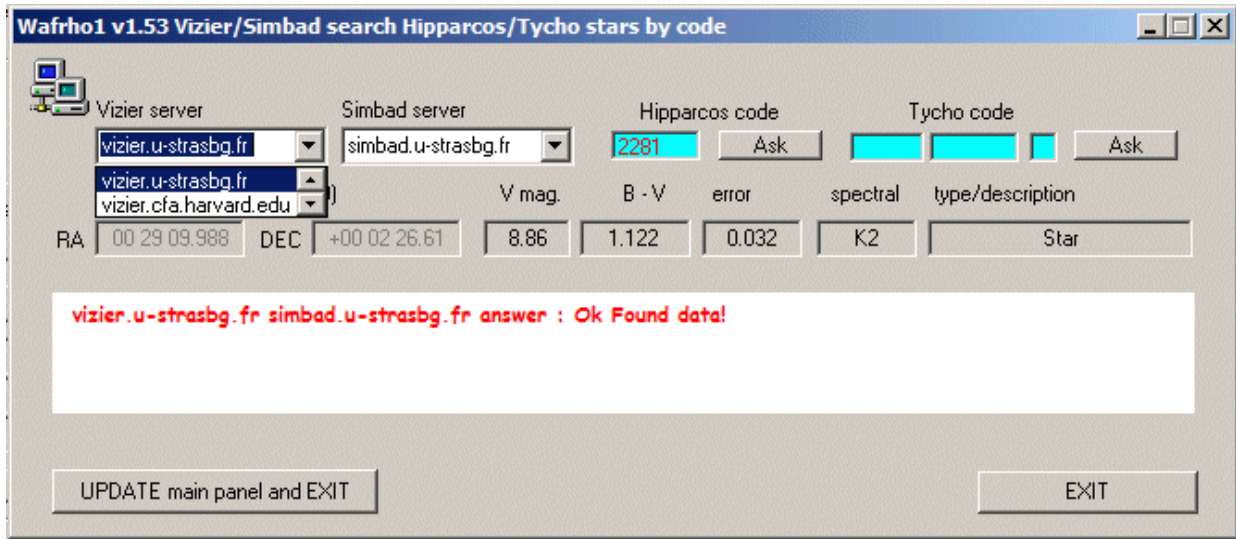
The program allow you to choose stars from Tycho-2 (5) catalog, if you have one. The catalog's folder is declared in default option menù. In **Catalog menu** you can open a window where the program look at stars around comet's position.



Pic.4 Tycho-2 (5) search catalog window.

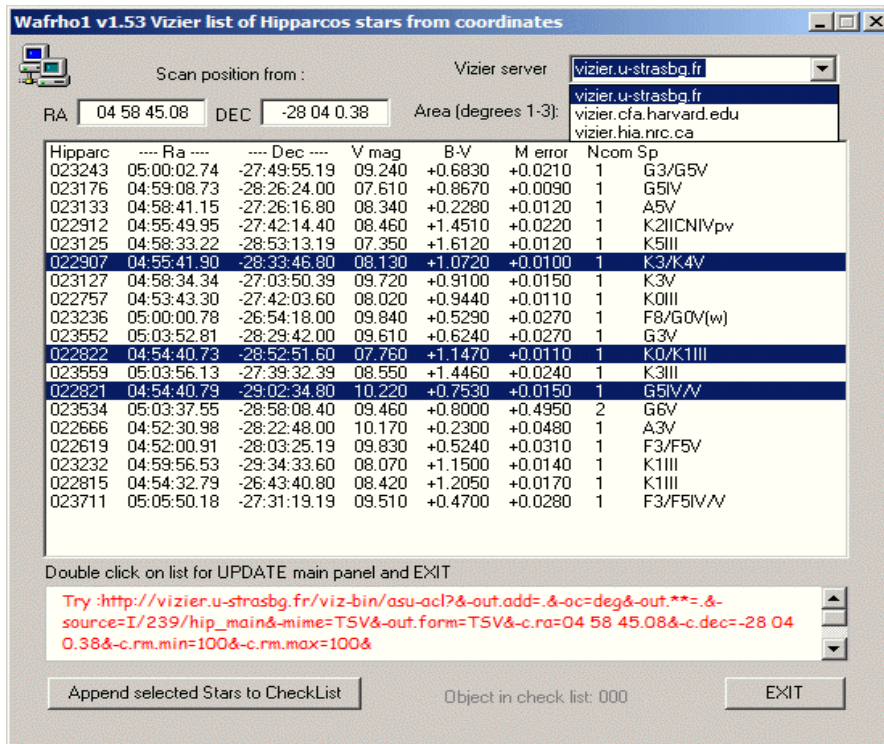
You can search stars in a area from one to three degrees around comet position. You can check and search only Hipparcos (6) stars if you are lucky and have some of them in your field of view. You can select several stars and add them to a check list in memory or, with double click, choose one for measurements.

An others options are offer to you, but only if you have a open connection with internet! In the **NetRequest** menu you can choose the item Vizier/Simbad star search to find reference star data from Simbad (7) server, if you know the code of the star.



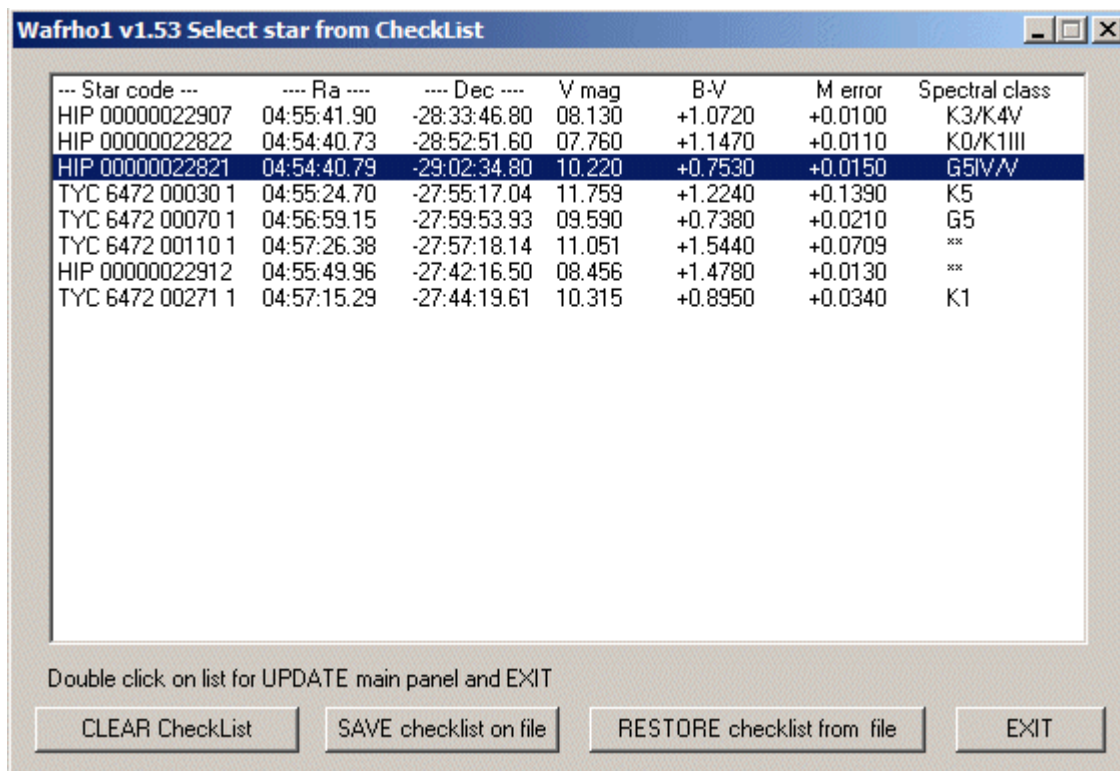
Pic.5 Vizier/Simbad search.

Elsewhere with the item Vizier/Hipparcos list you can open a window where through Vizier (8) server you have access to Hipparcos (6) catalog with the same options showed in "local catalog". You can also change the center of scan area to find more reference stars.



Pic.6 Vizier Hipparcos search.

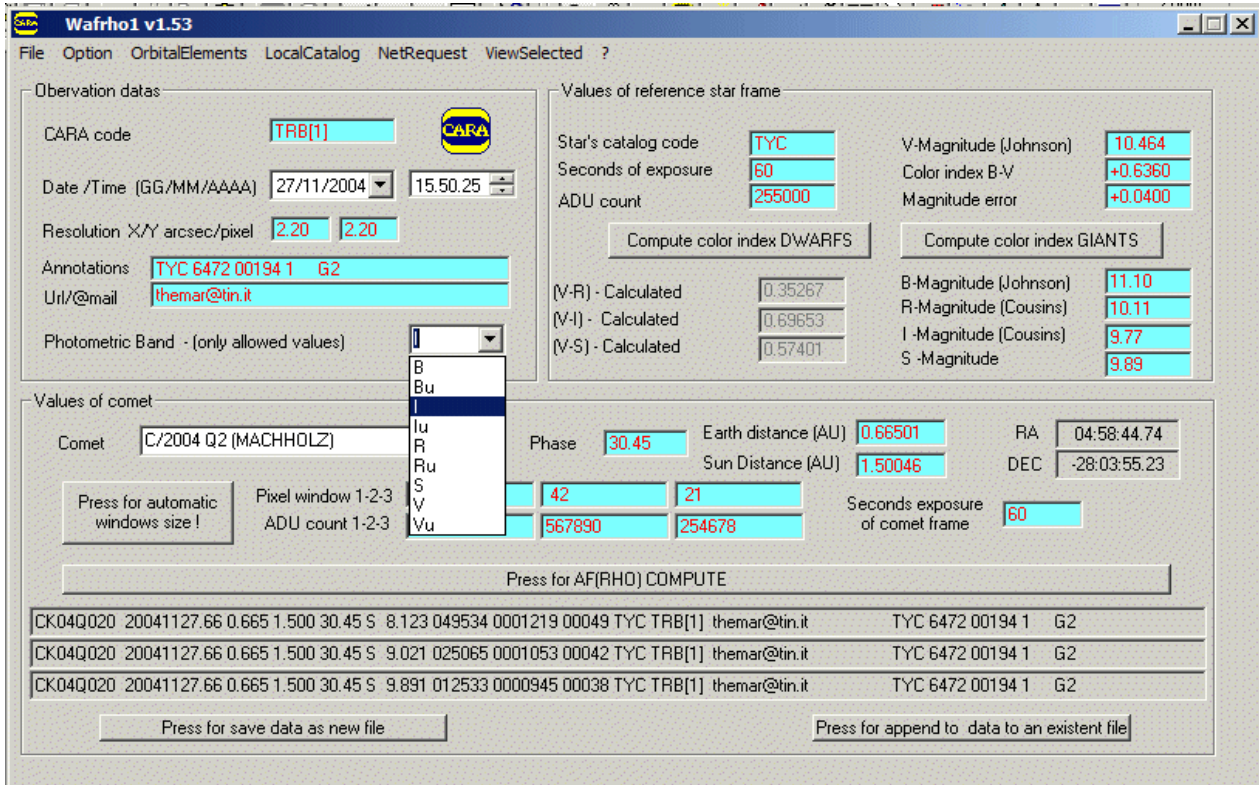
If you have added stars to a check list you can view them with menu **ViewSelected** and item ViewCheckList. In this window you see your selected stars. You can save the list in a file for afterwards operation, restore a previous saved list, clear the present list.



Pic.7 Check list window.

With double click you can choose a star for measurements. In main panel at reference star section are carried the values of V-magnitude, B-V index color values, the name and the spectral class of reference star. You must only add the time of exposure of your reference star's CCD frame and its ADU (9) values. Now you have two buttons for reduction of index color, one for dwarfs, one for giant star. The program reports the results of reduction (10)(11) in main panel.

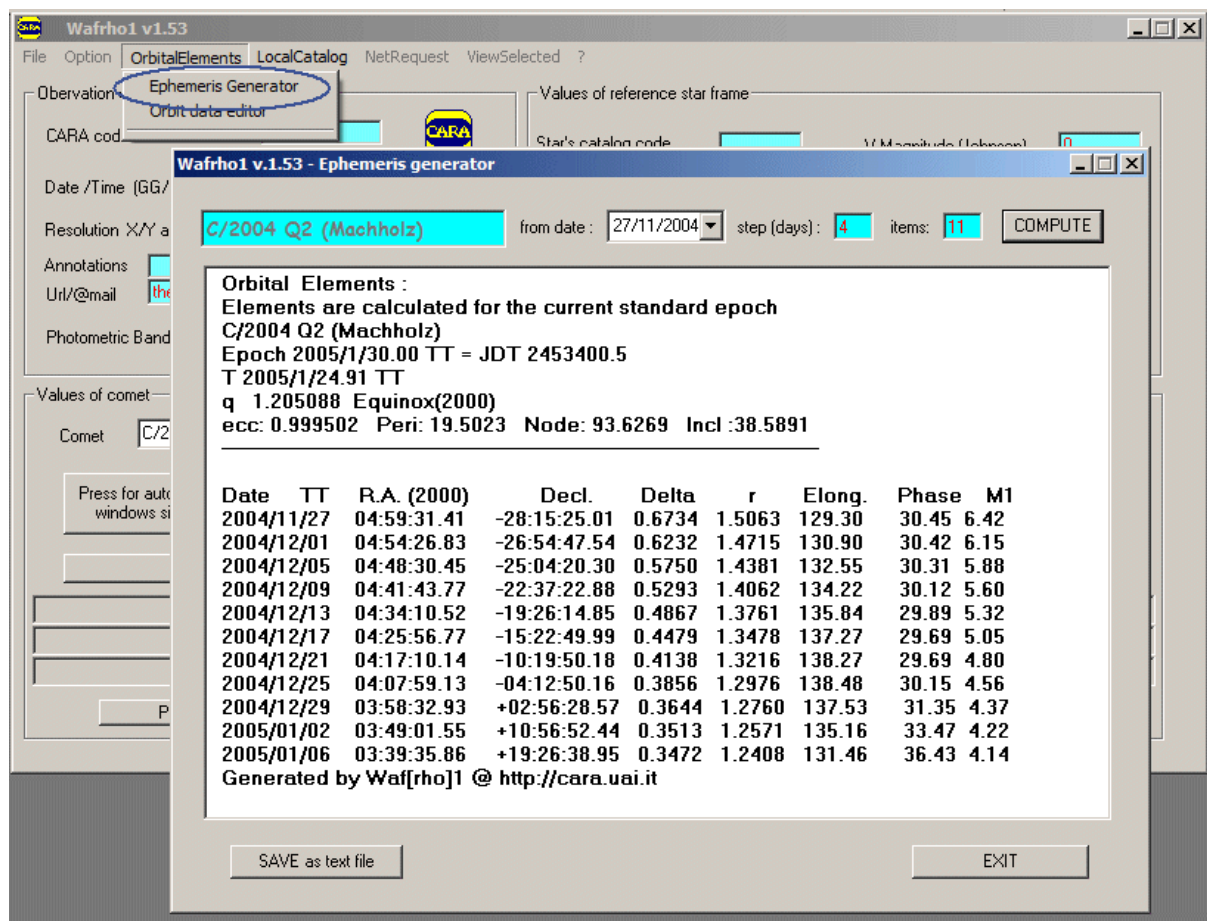
Now you can input the values of the comet. In apposite section of main panel, with the button named "automatic window size" the program suggests you the size of measurements windows in pixel (the program compute square windows of 100.000, 50.000, 25.000 km of side). You can changed these values but the program allow a window of 100.000 km maximum . Under the windows size values you must input ADU (9) values calculated on comet's CCD frame and the time of exposure in seconds. Now you can try the Af[rho] (1) calculation. If all input data are OK you will see in the lower frame of main panel the ouput data computed by program.



Pic.8 Af[rho] values computed.

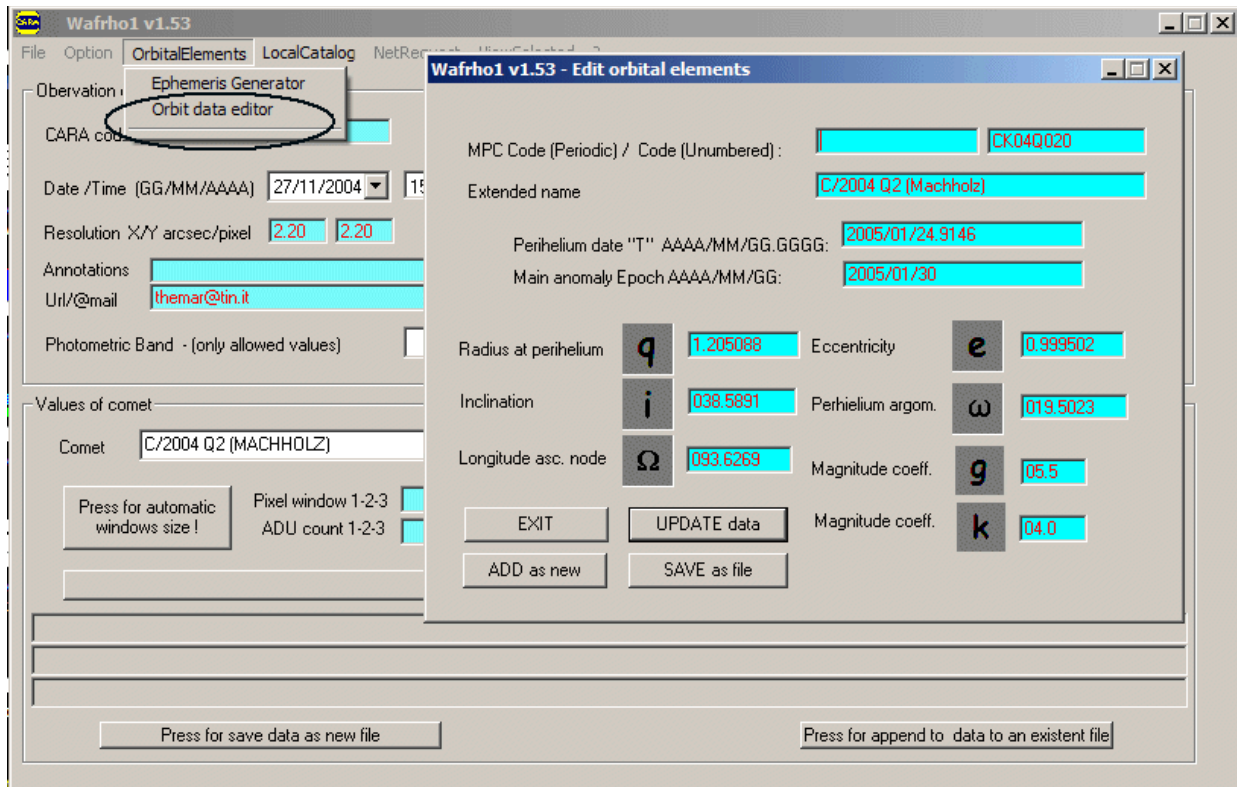
You can save them in an new file or append them to an esistent file. This file is formatted with CARA data base specification.

Other options that program offer you is the computation of comet's ephemeris and the specification of comet's orbital parameter. You can access it at **OrbitalElements** menu.



Pic.9 Ephemeris generator.

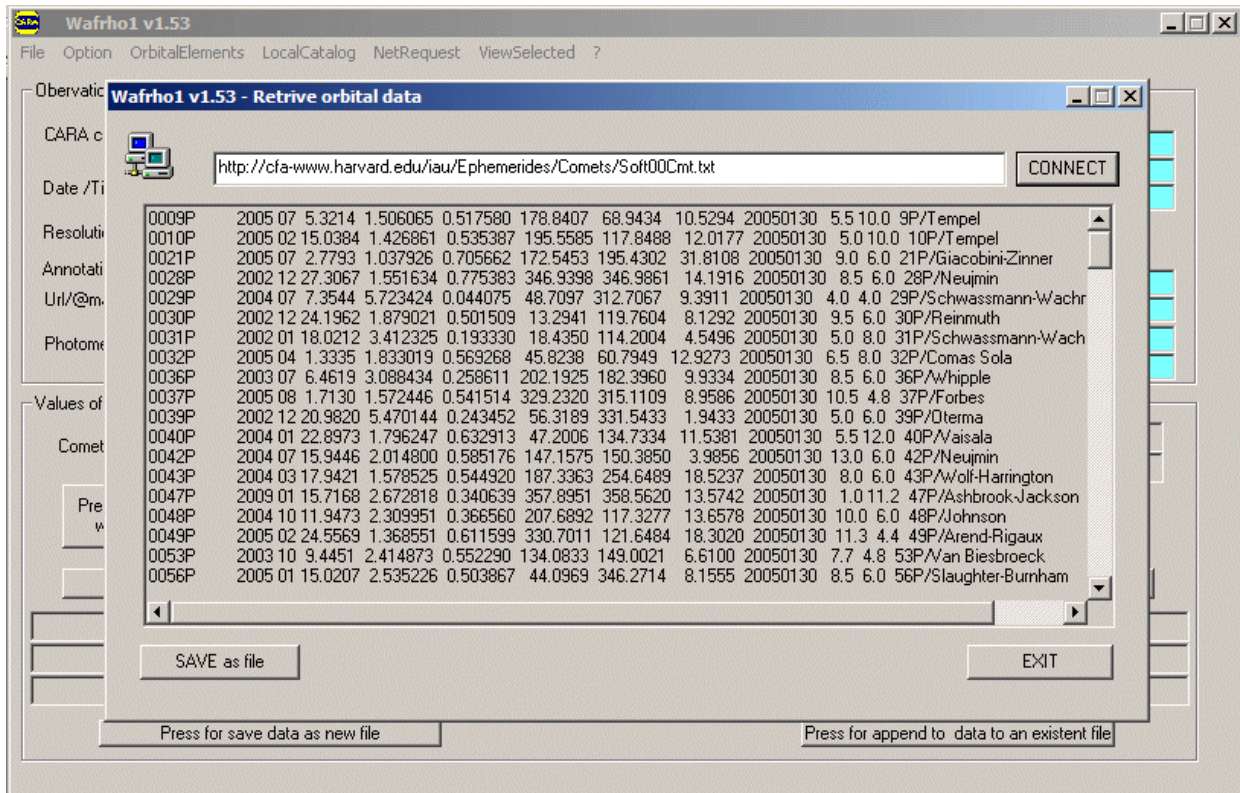
In this window you can set the start date, the number of item to compute (max 99) and the step in days between items (max 15). You can save the computation of ephemeris in a text file.



Pic.10 Orbit data editor.

In this window you can edit and change the comet's orbital data. You can update existent data or add a new comet's orbital data in program memory. You can save it as a new orbital data file formatted with MPC specification.

You can also access to orbital data file through internet choosing item "Get MPC comet data file" of "NetRequest" menu.



Pic.11 Getting orbital data from internet.

In this window the program look at orbital data at the URL showed in input field. If it finds them , you can save them in a file formatted with MPC specification.

This project will be always a work in progress!!See CARA site at URL cara.uai.it for revisions and news.

References::

- (1) <http://cara.uai.it/pages/afrho.html>
- (2) <http://cara.uai.it/pages/photom.html>
- (3) <http://cara.uai.it/pages/events.html>
- (4) <http://cara.uai.it/pages/before.html>
- (5) <http://cdsweb.u-strasbg.fr/viz-bin/Cat?I/259>
- (6) <http://cdsweb.u-strasbg.fr/viz-bin/Cat?I/239>
- (7) <http://simbad.u-strasbg.fr/sim-fid.pl>
- (8) <http://vizier.u-strasbg.fr/viz-bin/VizieR>
- (9) <http://cara.uai.it/pages/before.html>
- (10) <http://simbad.u-strasbg.fr/cgi-bin/cdsbib?1993SAAOC..15....1C>
- (11) <http://cara.uai.it/pages/papers.html>