Updated handbook for astronomical observations with

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About this document

This document is based on the background documents prepared by GianoTeam.
This is a practical, operational and updated guide for the astronomer.
It describes astronomer instructions at the telescope for observations, problems and precautions to be taken, management and data storage.

Please refer to the documents prepared by GianoTeam:
*GIANO cookbook for observers*
GIANO: The Graphical User Interface Manual
concerning the following items: characteristics of the instrument, its spectra in echellogram, the possible science, first estimates of performance, recommended integration time, observational strategy, and using the Graphical User Interface.

Finally, concerning the spectra reduction, in the tar archive *Reducing GIANO spectra with IRAF*, which you may download from the GIANO@TNG web page, there is also a handbook.

Getting Started

In the afternoon, before the observing night and after 16:00 LT, is necessary to start-up the astronomer's instrument part and carry out the first part of Calibration.
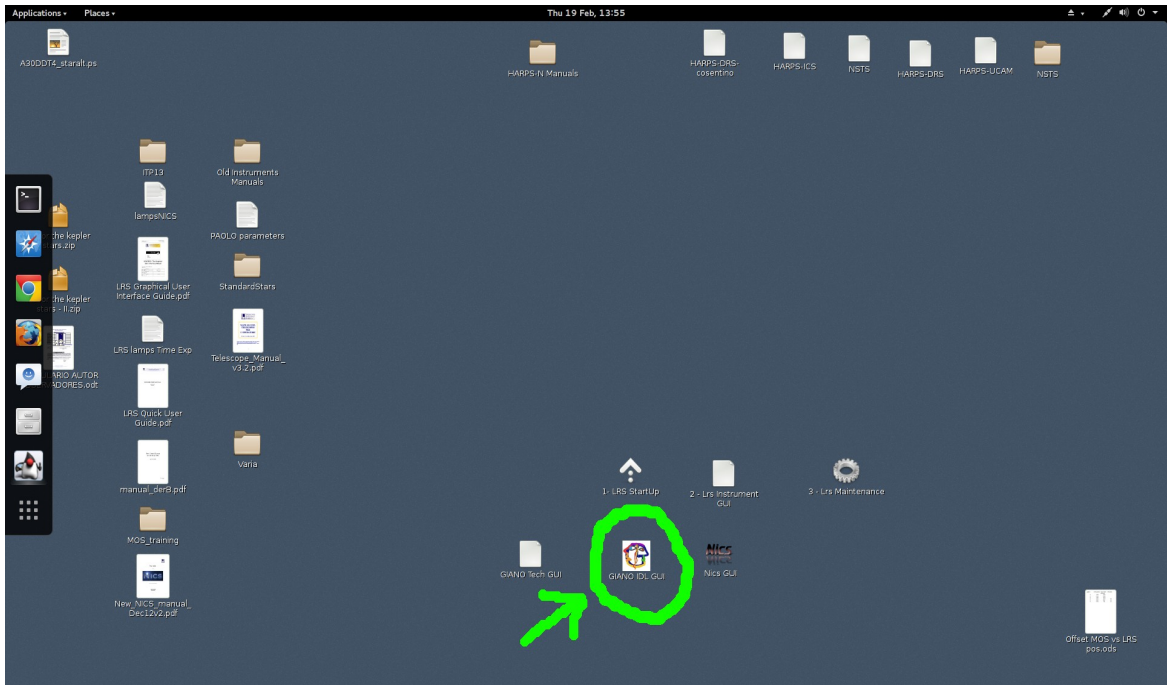
- To start an observing session with GIANO, click on the GIANO IDL GUI **icon** on the desktop of the WSASTRO workstation and the user interface main window will appear.
- In the *GIANO Manager* **menu** select **System Start Up** to perform the start up of the instrument. The *Giano Motors* window and the *tail logbook* window will appear; these windows can be minimized or hidden, since thay will not be used by the observer. The Start Up procedure ends when the sequencer button turns active.
- In the *Fiber Manager* **menu** select **Fiber Calibration**. This procedure takes about 6 minutes and ends when the sequencer turns active.
- In the *GIANO Manager* **menu** press the **SEQUENCER** button to start the sequencer panel.
- In the sequencer panel select the proper **PROGRAM NAME** in the drop-down menu

Calibration

<u>In the afternoon:</u>
in the sequencer panel press the **LOAD button** and select the
***CAL_NIGHT_BEGIN* sequence**.
It is recommended to use this sequence:

- 10 Darks of 300 sec
- 10 Darks of 60 sec (if any)
- 10 Flats of 60 sec
- 1 quick science acquisition in order to restore the observation motors setup.

<u>In the morning</u>, after the end of the observations, when the telescope is closed:
in the sequencer panel press the **LOAD button** and select the
***CAL_NIGHT_END* sequence**.

- 1 U-Ne lamp of 300 sec
- 1 quick science acquisition in order to restore the motors setup for observations

<u>IMPORTANT:</u> before starting the calibration ensure that the M1 cover is closed and the lights in the dome and Nasmyth A room are off.

Target Pointing and Centering

This operation is done at the telescope workstation by the telescope operator.
The observer must have ready the target list and the finding charts.
Target names, coordinates and proper motion can be stored in a catalog to be given to the telescope operator in the afternoon before starting the observing night.

The catalog name must contain the program name and have the extension *.cat* (e.g *AOT30_TAC99_standards.cat*).
The catalog must have this strucure:

NAME(max. 11 characters) RA DEC EQX pmRA pmDEC par rv EP
000001 00:01:20.200 +00:45:00.00 2000.0 0.0 0.0 0.0 0.0 2000.0
000002 00:15:20.000 +10:00:00.00 2000

where the first line is not read and where it is sufficient to indicate the first 4 columns.

The target centering in the fiber and guiding is done by using a red light CCD camera (I band) with a field of view of less then 100 arsec in diameter and with this aspect:
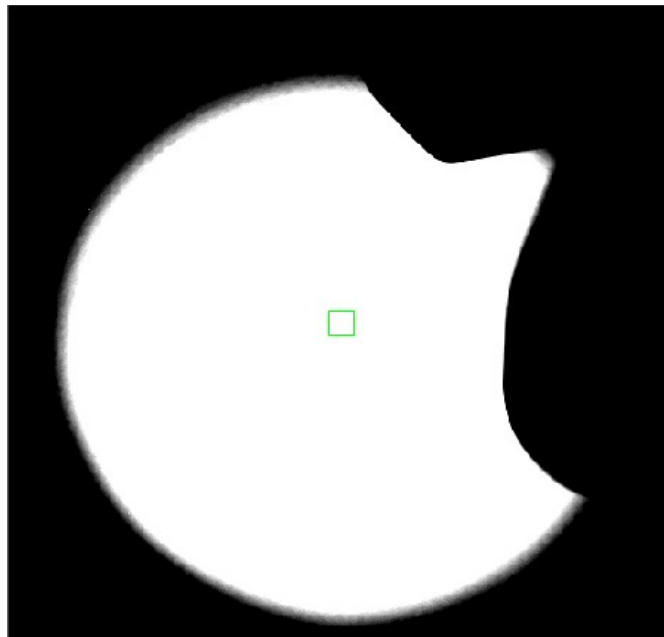
For a proper target identification, finding charts in red bands (e.g I or J) are recommended, especially in case of highly reddened objects or crowded fields.

Integrating

- Set up the desired observing mode and exposure parameters in the sequencer panel
- Activate the sequence(s) and the archiving functions by pressing the first and last button in the sequence row.
- Press START to execute the observing sequence(s).
- In the Main display Area the final ramp-reduced spectrum will appear.
- Some quick-look analysis is allowed in the displayed frame, even while the GUI works.
- When all activated sequences will be finished ,this window will appear on the screen

Data Handling

The acquisition system of GIANO produce tree types of spectra, namely:
- 1 reset and (N+1) 10 sec multiple non-destructive read-outs frames, needed to obtain one ramp-reduced frame with total exposure time of (N*10) seconds. These frames are codified with the name:
  GIANORAW.yyy-mm-ddThh-mm-ss.000.fts
- the ramp-reduced frame generated by combining of all the (N+1) multiples non-destructives read-outs frames a few minutes after the integration is terminated. These frames are codified with the name:
  GIANO.yyyy-mm-ddThh-mm-ss.000.fts
- the quickly ramp-reduced frame created in real time by the Giano GUI, by simply computing the difference between the first and the last non-destructives read-out frames. This frame is created only to allow quick look purposes by the Giano GUI and it is codified with the name:
  GIANOQL.yyyy-mm-ddThh-mm-ss.000.fts

All these frames are saved in the *gianoPC* directory: /home/giano/data/giano/yyymmdd (the ramp-reduced frames are saved in the directory *ramp_reduced* and the quiklook frames in the directory *tatanka*) and are send in the Italian Astronomical Archive in Trieste (if the SAVE button in the Giano GUI SEQUENCER is selected), from where the user can retrieve them.

END of the NIGHT
When the observing night and calibrations are finished the observer must click the **ARRIVEDERCI button** in the GUI main.

Troubleshooting

In the following we will describe a series of known problems and bugs and how to solve them.

- **The Giano GUI remains stuck during an acquisition ramp:**
  checks whether, despite the interface is locked, the instrument continues to acquire GIANORAW (in the data directory) until the ramp is finished. In this case waits until it terminates the ramp. Then try to ABORT the integration (with the button "*ABORT*"): if it does not work go to the *runidl* window and type *^C.*
  You can restart the integration or the Giano GUI (if you have killed it) and continue the observations: during the following hours the incomplete data acquired will be automatically corrected and completed.

- **The *Timer Panel* display "Reading Image" and the time counter is more that 30 second:**
  Abort the integration and restart it : there is some problem in writing the image.

- **The Giano GUI remains stuck and it is imposible to exit with the appropriate botton:**
  go to the *runidl* window and type ^C.