1 Short introduction to the NRT observations.

How to prepare your observations, and start with data reduction, with the NRT off-line computer. (Document prepared by P.Colom & J.M. Martin, V1.1 09-JAN-2002 - LaTeX 14-FEB-2002)
Here we give some recipes for the preparation of your observation runs (source list, telescope setup – with PAN), and for the analysis of your data (edition of the data, calibration with NAPS, and analysis with CLASS or SIR).

1.1 How to start on the off-line computer (DEC UNIX)

- `telnet connection: nanrt5.obs-nancay.fr`
  `login: guesti ! i from 1 to 7`
  `Password:`
- a useful instruction, to add in your .profile (with your own terminal address) :
  `#... to send displays towards your terminal:`
  `alias -x setmydisplay="export DISPLAY=145.238.32.8:0.0"`
- to print : `lpr -Plaser4000t file.txt` (laser printer in the NRT lab)
  `lpr -Plaser4000p file.ps`
  or try `man nrtprint` (in french)

1.2 PAN - Préparer A Nançay: Prepare At Nancay)

Pan has been designed (by Ismael Cognard) to build your source list, and the telescope observing setup.
`$ pan`
`pan> help`

..... concerning source (records) management:
`pan> creasou` !to create your source
`pan> duplisou` !to duplicate your source
`pan> loadsou` !to load a source; allows you to modify
`pan> modisou` !to modify the source
`pan> listsou (short: lss)`!produces a list
`pan> dumpsou (short: ds)` !to print out your source (see help dumpsou)
`pan> otrisou numero 1 20 ascensionDroite !` list of source records number 1 to 20, sorted by R.A., written in the file trisou.out

..... concerning telescope setup:
Since this part is the most difficult to handle, we will certainly help you. It is possible to duplicate a map from an uic toward another one, if authorization is given (please contact the staff, see below).

`pan> creamap` ! to create the "map" of the telescope

```
pan> duplimap, etc...
pan> exit
```

1.3 Data

1.3.1 Data types, location

types of file: `nco = new correlator`
`fil = filters`
`sfr = sefram`
`sao = acousto-optical spectrometer`[1]

Your data are automatically transfered from the on-line computer toward the off-line one. Your raw data are stored in files, depending which back-ends you asked for:

```
                     type scan# uic
                     --------------
correlator spectra: nco023956.143
filters data      : fil023956.143
sefram data       : sfr023956.143
aos data          : sao023956.143

type of file: nco = new correlator
              fil = filters
              sfr = sefram
              sao = spectrometre acousto-optique
```

fil files are used for spectra calibration, or for continuum measurements.
nco and fil files are synchronized with the telescope tracking.
sfr files contain asynchronous total power measurements.
sao files contain asynchronous wide-band spectral measurements.

scan number: your observation number (6-figure number)
uic: telescope user id

Check in your data with lstdata:

```
$ cd /data2/guesti
$ lstdata -file nco -tail 10      ! restricted to nco files
$ lstdata -help                   ! help in french
```

[1] **S**pectromètre **A**cousto-**O**ptique

1.3.2 file management

The first thing to do is to setup the user files needed to work properly with naps and sir. Normally you should perform the 2 following steps:

`$ fip` ! tool to setup files and directories (Laurence Alsac)

1. click on setup (setup window opens automatically at the first time)
   - choose your directory (a default is proposed).
   - a "groupe de resultats" is a directory containing your data in SIR format
   - your file will have a name like R000001.res (the original scan number is kept in the header file); it is created each time you make a "save" in NAPS.
2. menu "fichier": "sauver dans .configdep", then "quitter".
   An initialisation file is created: `.configdep`. This file is used by NAPS and by SIR. The directories and files needed by NAPS and SIR are created automatically.

DONT PANIC ! ! In principle, this has been done, so you already have the folder:

`/usr/users/guesti/sir` which contains '`groupe1`' (for SIR format files) and '`sorties`' (graphic and text outputs).

The fits format directory, used by NAPS (and CLASS), must be created manually:
`mkdir /usr/users/guesti/fits`
Of course you can run fip again, or modify your .configdep file.

1.4 Data-processing softwares

1.4.1 NAPS - NAncay Preprocessing Software (Patrice Renaud)

Data reduction, calibration, exportation in SIR format, also in FITS format.

As in pan, you will find an on-line help (in french – type help). An english translation of this help will be available on the Nancay web site. A manual (in french, version July 2000) can be found on `/usr/users/renaud/naps/distribute` on nanrt5 :
`naps_userguide.doc`
`naps_userguide.pdf`

NAPS can read and process fil and nco files. A few commands are following:

```
NAPS> set scan 23956          ! defines current scan; reads data file header
NAPS> show cycle 1            ! your observation is divided in N identical
                              ! cycles, focal carriage position apart
NAPS> sup cycle 1             ! suppression of cycle 1
NAPS> disp mode=1             ! example of 2D display of the whole scan
NAPS> inte                    ! integrate your N cycles
NAPS> save                    ! = inte + writes in SIR (FITS) format
NAPS> set result fits         ! next save will produce FITS format
```

NAPS is based on the RSI IDL language, and is installed on the Meudon computers (mesioq.obspm.fr). It is possible to install this IDL package on local computers (unix, IDL5.4 or higher).

1.4.2 SIR - Système Interactif de Réduction

Analysis software (written by Dominique Aubry, and Laurence Alsac, supported by Laurence), using data saved in SIR format by the NAPS package.
Warning: please do not start SIR with "$ sir &".
An english version of the manual will be soon updated and made available.

1.4.3 CLASS

The Grenoble package can read NRT spectral data, written in FITS format. It is installed on nanrt5, and on the Meudon computers. For local data processing, this package can be obtained by anonymous ftp on iraux2.iram.fr.

1.4.4 Other tools

2D (time-frequency) fast visualization of spectral data can be made with the PLTNCO tool. (type pltnco to get a help message – written in french)

1.4.5 support

You may find on-line man pages on the nanrt5 computer, and please contact the scientific and technical staff in case of problems.

```
man nrt             ! in french
man nrttools        ! in english
man nrtoutils       ! in french
man nrtprint        ! in french : help about NRT lab. printers and
                      related commands

FOR - THE PREPARATION OF YOUR OBSERVATIONS
    - THE FOLLOW-UP OF YOUR FIRST OBSERVATIONS

PLEASE CONTACT THE SCIENTIFIC STAFF :
Pierre Colom    pierre.colom@obspm.fr     (Meudon,  +33(0)1 45 07 75 79)
Ismael Cognard  icognard@cnrs-orleans.fr  (Orleans, +33(0)2 38 25 79 08)
Eric Gerard     eric.gerard@obspm.fr      (Meudon,  +33(0)1 45 07 76 07)
Jean-Michel Martin jean-michel.martin@obspm.fr (Meudon,  +33(0)1 45 07 79 14)
Gilles Theureau theureau@cnrs-orleans.fr  (Orleans, +33(0)2 38 25 53 10)

Concerning your work in the NRT lab, you may contact Laurence Alsac,
technical manager of the radio telescope, also in charge of the calibration
follow-up.
laurence.alsac@obs-nancay.fr    (Nançay, +33(0)2 48 51 86 29)
```