OSSERVATORIO ASTROFISICO DI ARCETRI
CENTRO PER L'ASTRONOMIA INFRAROSSA
E LO STUDIO DEL MEZZO INTERSTELLARE
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SUBJECT: Data handling with Tirgo Nicmos3 instruments

All data taken with Tirgo Nicmos3 instruments (Arnica and Longsp) are stored directly as standard FITS files at 16 bits integer format.

Every file has an unique name formed from the last 4 digits of the integer part of current Julian date and from 4 digit of a sequencial number. The acquisition program never rewrites over an old file. If program is forced to send data to an existing file, it increments automatically the sequencial number until it get a not already used filename. Sequencial number is protected from casual user, and should be changed *only* for special purposes. To each file is associated an one line description, accessible to DOS *dir* or in the file "lista.txt" on other systems. The comment contains source name, integration time, and, if telescope is connected, also the coordinates with a limited precision. An example in table 1.

```
 Volume in drive D is ULTERIORE      Serial number is 3713:19EE
 Directory of  d:\arnica\data\*.*

.            <DIR>     11-12-93   9:04
..           <DIR>     11-12-93   9:04
95130049.fts   135360   6-10-94  16:50 NGC4590 K -4.0s 12.39.30 -26.45.1
95130050.fts   135360   6-10-94  16:50 NGC4590#00 K -4.0s 12.39.30 -26.45.1
95130051.fts   135360   6-10-94  16:51 NGC4590#05 K -4.0s 12.39.30 -26.45.1
95130052.fts   135360   6-10-94  16:51 NGC4590#07 K -4.0s 12.39.30 -26.45.1
95130053.fts   135360   6-10-94  16:51 NGC4590#08 K -4.0s 12.39.30 -26.45.1
   1,218,708 bytes in 5 file(s)         1,257,472 bytes allocated
 120,770,560 bytes free
```

Table 1

We have done a precise effort to include in the fits header all relevant informations available to the system, as source name, telescope position and so on. An example is reported in table 2.

Data are stored in a working directory. Due to limitation of Dos, the more files are present there, the slower is the processing of a new file. After having collected a between 50 to 100 data files, observer should exit from acquisition program and use a 4Dos procedure (*savedata*) to move data files to a permanent location. The command *savedata* has no arguments and should just called. Data will be moved in a directory belonging to a tree of directories which permits to separate easily data of different dates, as in table 3. Each *savedata* creates a new subdirectory in the present day directory.

```
SIMPLE  =                    T
BITPIX  =                   16
NAXIS   =                    2
NAXIS1  =                  256
NAXIS2  =                  256
ORIGIN  = 'T I R G O'            / TIRGO Observatory
BSCALE  =        1.0000000E+00   / real_value = tape_value * BSCALE + BZERO
BZERO   =        0.0000000E+00   / real_value = tape_value * BSCALE + BZERO
BUNIT   = 'COUNTS'               / Each count corresponds to  19  electrons
OBJECT  = 'NGC4590'              / Identifier of source
DATE-OBS= ' 10/06/94'            / UT date of data acquisition
TIME-OBS= ' 15:49:55'            / UT Time of data acquisition
J-DAY   =        9.5131597E+03   / Julia n date of acquisition minus 2440000
DATE    = ' 10/06/94'            / UT date this file was written
NUMBER  =                   49   / Incremental acquisition number
INSTRUME= 'ARNICA    '           / Device who measured data
OBSERVER= '    Carlo_Baffa'      / Observer name
FILTER  = ' K 1200 '             / Filter name and wheel position
TIME-INT=        1.0000000E+00   / Integration time on detector  1.0 * 4
COADDS  =                    4   / Number of frames added togheter
RA      = '12.39.30,0'           / Right ascension of source
DEC     = '-26.45.10'            / Declination     of source
EPOCH   =        1.9500000E+03   / Epoch of coordinates
AIRMASS =        2.3000000E+00   / Airmass when acquisition started
DATAMIN =        9.1000000E+01   / minimum value in array
DATAMAX =        9.9990000E+03   / maximum value in array
DOUBLESA= 'ON '                  / Double sampling enabled
END
```

Table 2

```
D:.
|
+---ARNICA
    |
    +---DATA
        +---SAVE
            +---94_JUN
                |
                +---JUN_14
                |   +---1
                |   +---2
                |
                +---JUN_18
                    +---1
                    +---2
                    +---3
```

Table 3

At the end of each night, data must be moved to the Worm pc disk. Observer must place the current Worm cartridge in the pc and run the procedure *trandata* which will automatically copy data. At the end of copy which can take few hours, the procedure asks if all has be done properly. If all is OK it deletes data from the hard disk.

Note that *trandata* can transfer only the data of current civil day, so this operation should be done before the beginning of the new night, and, for its duration we suggest to run it at the end of the observation. In case older data should be transferred, please contact me.

We mantain an archive of all data taken with our instruments. Data are stored in a series of write only cartridge (Worm) each containing nearly 400 Mega bytes of data on each side. Each cartridge contains data of several weeks of observations, and has a progressive label which identify the sequence as in DATA_9A and DATA_9B (the two sides of a cartridge). It is a wise idea to annotate on the ufficial logbook the name of the cartridge in use.

Data can be trasferred to the tirgo sun (tirgo or toutatis). Small amount of data can be tranferred by ftp, remeber that data must be transferred in bin mode! A procedure called *worm2tar* is meant to tranfer all data belonging to an observer together with appropriate standard stars to a dat cartridge. The procedure scan all Worm subdirectories and transfer all data whose object names appeare in a given observation catalog. Also all Arnica standars appearing in the same subdirectories are transferred. The appropriate catalog must be in the
arnica
catalog directory, and the system should be configured properly in order to access dat device on sun. This operation is NOT intended as a generic user operation and shoud be done by a staff member. Table 4 lists *wor2tar* summary usage.

```
usage:  worm2tar obs_cat_name [-h host] [-u user] [-s source] [-f destination]
DEFAULTS:
         host:     toutatis    (Sun TIRGO)
         user:     softir
       source:     F:          (worm drive)
  destination:     /dev/rst1   (DAT drive)
```