IR Instrument Control System

WildFire

The IR instrument control system consists of several programs to help make data taking easier. This document outlines the programs and how to use them. It also includes help for instrument specific commands and start-up procedures.

Starting The IR system.

To start the IR system you should first log into the observer account ***“ir50inch***", ***“ir2meter”*** or ***“ir4meter”*** on the telescope IR data machine. (berry at the 50", royal at the 2 meter or cocoa at the 4 meter). Once logged in start the window system you wish to use by typing "***st***" for suntools or "***op***" for openwindows. The console screen should end up looking approximately like figure 1. below.

To start the system move to the "IRAF Gterm" window and type "*goiraf".* Then move the cursor to the "instrument control" window and follow the startup procedures in Appendix 1. Normally you will only need to type "***powerup*** *INSTRUMENT*" where *INSTRUMENT* is the name of the instrument to be started. (COB, CRSP, IRIM or SQIID). ***NoTe:*** These commands are case sensitive. type “ powerup COB”.

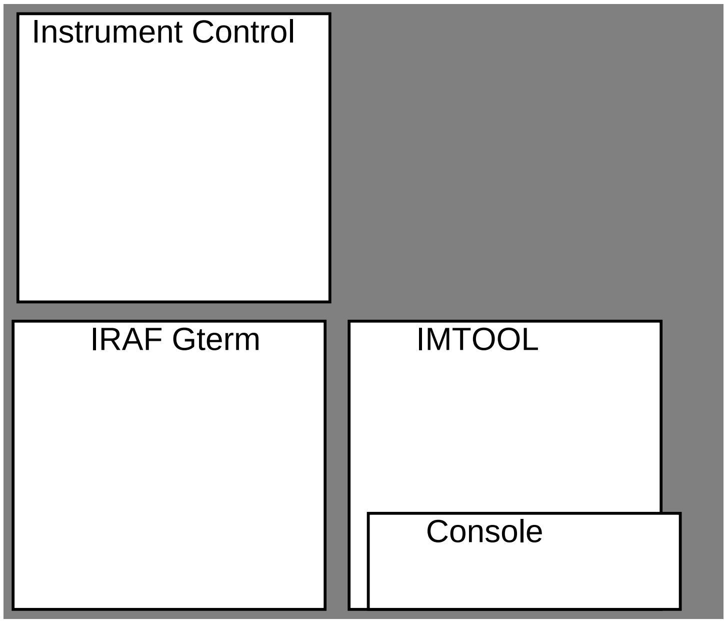

Figure 1.

You will then be asked if the power to the instrument has been turned on, at this point turn on instrument power and type ***<return>***. A series of messages will be displayed relating to the downloading of the configuration of the IR system followed by a second question asking if you want windows, answer this question with a "***y***" and ***<return>***. The instrument programs will then be downloaded. Appendix 2 contains output appropriate to a successful startup of each instrument. The downloading process should complete with a "***%***" prompt.

When the "***%***" prompt appears type "***setup*** instrument" to load a standard voltage setup and microcode into the instrument. It is important that this be done as soon as possible after the power is turned on. The process of downloading code can leave the detector in an indeterminate state until a setup is completed. This can effect observing for several hours in some instruments.

The remainder of this document outlines the available user commands and how to use help.

Using the IR system Help.

The IR system Help is available by typing "***help***" at the "***%***" prompt. This will display a list of available help topics and will request a topic for additional help. Typing "***help topic***" will display the help on topic. Help is available on the following topics:

- index -- keyword index of all help
- help -- how to use help
- tcl -- basics
- keyboard -- arrow keys, name completion
- parameters -- setting, saving, using
- pictures -- taking pictures
- microcode -- downloading of microcode
- tcp -- using tcp headers and moving the telescope

Using the IR Command Line.

The keyboard package used by the IR user interface is GNU readline. This package allows history recall and command line editing. Moving between and within lines uses the arrow keys or a sequence of keystrokes as given below. A *C-char* == control-char, that is hold down the control key and type the character. A *M-char* == meta-char == Esc char, that is type the Escape key followed by the character key.

Here are the most useful key sequences.

C-d	delete under cursor
C-k	delete to end of line
C-w	erase word
C-	undo
arrows	move cursor right or left, move up or down history list.
C-a	move to beginning of line
C-e	move to end of line
C-l	clear screen
C-f	forward character
C-b	backward character
C-n	forward line
C-p	backward line
M-f	forward word
M-b	backward word
TAB	complete current command, filename or word
TAB-TAB	list all possible completions
M-?	list all possible completions
<return>	execute current line

Most prompts and commands have completion setup to reflect the possible inputs.

Parameters

This section will outline the use of different parameter sets, setting parameters, and saving parameters sets.

The available parameter sets may be listed with the ***lpar*** command. "*params.par*" is the default parameter file. A parameter set may be loaded with the ***puse*** command. A ***psave*** command will save out the current parameter set.

The parameters that are available are the following:

coadds	Number of coadds
lnrs	Number of lnrs
pics	Number of pictures
delaysec	Integration time (seconds)
filename	Filename template
headerdir	Header Directory
pixeldir	Pixel Directory
mode	Process mode
picnum	Picture index
ucode	Microcode
display	Channels to display
ra	RA of object
dec	DEC of object
epoch	EPOCH of object
offset	Observation offset
type	Type of observation
airmass	Current airmass
comment	Comment
imlist	file name of image list**
title	The iraf header title
save	Channels to save to disk
var1-4	Four freeform variables which can be selected in iraf scripts

**(see M. Merril for an example of how this can be used.

A single command, setparams, can set all of these values, although many of them have other commands which also set them. (see setparams, ppar, lpar, puse, psave.)

Taking Pictures

There are three basic ways of taking pictures: ***go***, ***observe***, and ***movie***.

The ***go*** and ***movie*** commands assume that the parameters defining the observation have already been set, either through an ***ask***, a previous ***observe***, or explicit assignment. The ***observe*** command will prompt the user for the various parameters (which ones are asked can be set using eask). See parameters, ***go, ask, observe, movie, eask.***

Observations can be stopped by typing ***“abort <return>***” in the instrument control window. One additional frame is completed immediately and the observation is stopped. The captured data is discarded.

“movie” is stopped by typing ***“end<retrun>”*** in the instrument control window.

Several commands are provided to make data taking easier. See raster9, do_standard, do_field,

Telescope control

The telescope can be moved with the ***north, south, east, west or toffset*** commands. The ***north, south, east, west*** commands take a single argument, the distance in arc seconds. The ***toffset*** command takes two arguments the distances in arc seconds to move east and north. “***toffset 10 100***” offsets the telescope east 10 then north 100.

Explain boaa, toaa here???

User Commands

! *[arguments]* ***-*** This command runs a shell using given arguments as commands to the shell.

?coadds - This command returns the number of coadds to do on the next picture taken.

?filter - This command lists the current positions of all mechanisms in the current instrument. It is used to get the current status of the instrument filters.

?inttime - This command gives the current integration time set into the instrument.

?lnrs - This command returns the number of low noise reads to be taken per coadd on the next observation.

?mode - This command displays the data collection mode of the DSP worker nodes. Several modes are available for diagnostic and data taking purposes. The standard data taking mode is called "stare" mode.

?script - This command lists the available tcl scripts for the current instrument and observer.

?settime - This command gives the current integration time set into the instrument.

?spmode *[channel]* - This command reads the mode of a spad (**S**ignal **P**rocessor/**A**2**D**) card and displays it in a human readable format. ***?spmode*** will read out channel 0 and display the current settings. If a channel number or name is given, that channel will be read out instead.

(see spmode.)

?time - This command reports the time settings in the instrument as well as the minimum and curent integration time.

?ucode - This command returns the name of the currently downloaded code. The name returned may be wrong if the code was downloaded using the low level routines or has not been downloaded at all.

abort - This command halts teh current integration/observation and discards the data collected as a result of the observation.

activate - This command activates the detectors. This action takes place immediately. However, certain instruments (***CRSP***, and ***IRIM***) require a button to be pushed befroe the array is activated. (see deactivate.)

ask - ask will ask all of the questions specified to be asked by ped. This command is called when the user types observe, before the observation starts.

The user can use the arrow keys to return to previous questions or move around on the line. Emacs-style cursor movement is also possible. The ***<TAB>*** key is used for command completion. If the user types ***<TAB>*** twice, then the available completions are displayed. For many of the questions a custom set of completions are installed, so this will list available options.

NOTE: the parameters set are NOT sent to the dspw, inst, b016, sequencer, they are for local use only until a ***sendParams*** is executed. Both ***go*** and ***observe*** execute ***sendParams***.

(see ped, observe, go, sendParams.)

askMode *[0|1|on|off]* - This command sets the question asking mode. If the askMode is 0 or off, then the original style of questions will be asked, that is, the line buffer will contain the current (and default) value. If askMode is 1 or on then the default value will be placed in square brackets. If the user presses return, the default value will be used, otherwise the value typed in will be the new value. The default value can be inserted with a C-Y.

changes - This command gives a list of recent changes to the system.

checkdisk - This command will check the current header and pixel areas on the disk to determine if there is enough space to fit the images and their headers.

comment *[new_comment]* - This command resets the header COMMENT field to *new_comment* or prompts for a comment string if *new_comment* is empty.

coadds *[numberofcoadds*] - The coadds command will set the number of coadds to do on the next picture taken. If the command is executed without an argument, it will prompt the user for a new value, using the current value as the default.

dark - This command set the system up to take a dark. It sets the RA, DEC and Epoch to zero, and sets the type header field to “dark”.

deactivate -This command deactivates the detectors. This command takes effect immediately.

(see activate.)

delay *[seconds]* - an alias for set-time.

(see set-time.)

display *[channels*] - display controls which channels are displayed as they are saved. If no argument is given, display will prompt the user with the currently displayed channels. If no channels are specified (either by erasing all the channel names at the prompt or executing '***display ""***') then no channels will be displayed. On a system with only one channel, the channel name is "*only*".

The display will be auto scaled unless the ***zs*** command has been used to set the upper and lower limits of the display values. (see ***zs***)

NOTE: hitting ***<TAB>*** will cause "*only*" to be filled in at the prompt.

dl *[ucodename]* **-** This command is an alias for download.

download *[ucodename]* - Download will first kill off any microcode that is running and then download new microcode and start it running. If no name is given, download will prompt for a microcode filename, giving the current or default value as the default.

NOTE: hitting ***<TAB> <TAB>*** will list all microcodes available for the current instrument.

(see dl, luc, dsetup).

dsetup *[microcodename]* - dsetup will initialize the instrument voltages to their proper values and download the microcode. If no microcode name is given, a default code for the instrument will be used will be used.

(see download.)

eask - eask will iterate through all of the known parameters, allowing the user to specify which questions are asked and which parameters are displayed. For example:

```
List/Ask params(pics): l
List/Ask params(delaysec): la
List/Ask params(filename): a
```

The pics parameters will be listed, but not asked. The delaysec parameter will be listed and asked, and the filename parameter will be asked, but not displayed.

(see ped, ask, psave, ppar, lpar.)

filename *[fileName]* - filename sets the picture filename. The path is not included in the filename. A %d or %03d should be inserted where the picture number should be placed. If no %d is given, one will be appended. If there is more than one channel, a %s should be inserted somewhere AFTER the %d. If there is more than one channel and no %s exists in the filename, one will be appended.

NOTE: this will overwrite existing files if the filenames conflict.

(see headerdir, pixeldir, picNum, newImdir.

freeze *[state]* - freeze controls the activities of the instrument controller in regard to reading out the housekeeping data and allowing changes to operating voltages. ***freeze*** with no arguments will turn off the reading of housekeeping data and the setting of voltages. A ***freeze*** *0* will turn it back on. ***readhk***, ***dsetup*** and ***setup*** will re-enable the reading of housekeeping data before they run.

(see unfreeze.)

go - *go* will perform an observation using the current setup. This command simply repeats the last observation or initiates a new observation based on the current parameter settings.

(see ask, observe)

headerdir *[dirname] - headerdir* sets the directory for IRAF image header files. If no directory is given, the current header directory will be used as a default. If an invalid directory is given, and error message will be displayed and the old setting will be used.

(see pixeldir, newImdir.)

help *[topic]* - The help command is used to get cross linked help on the IR user interface. All of the user commands are documented in the on-line help, and you can obtain information about them by typing:

help *filename*

If cross reference information is present, you will get a display like this at the bottom of the screen:

```
Cross Reference: headerdir newImdir picNum pixeldir
topic>
```

At this point, you can type in a related topic (the cross references are available for completion with ***<TAB>***). If no topic is given, help will terminate. ***help*** with no topic will give an interactive general overview. A keyword based index is available with the command:

```
help index
```

You will be prompted for a keyword (regular expressions are ok, and it is case insensitive).

```
Keyword: file
Cross reference: download eask ed editor filename headerdir headerhk
help
topic>
```

helpw - activates a motif-like help interface.

hkscreen *[screenname]* - hkscreen controls which housekeeping screen is displayed when a readhk is executed. The screenname can be a number 0 - 4, or one of the following:

stat s volt v temp t filters f tlist

If no screenname is given, the user will be prompted for a new one with the current screen name as a default. This command performs a readhk to fetch the most recent data.

(see status, readhk.)

inttime *[time]* - inttime is the same as set-time.

(see set-time.)

lnrs *[num]* - lnrs sets the number of low noise reads per coadd. If no number is given, the user will be prompted for one and the current value will be used as the default.

loghkdata *[on|off]* - hksave enables or disables the logging of housekeeping data. By default, the data is not logged, and by default this command will save them. If the data is logged, then the time and date will be written to the log file, along with whatever is displayed on the screen.

longheaders *on|off* - *longheaders* enables or disables the saving of housekeeping voltage data in the IRAF header file. The saving is off by default.

lpar - lpar will list all of the available parameter files.

(see puse. ppar. psave.)

luc - luc will list all of the available microcode files.

(see download.)

microcode - download microcode. The user can download new "microcode" at runtime. To see a list of the available microcodes use the ***luc*** command. To download a new microcode simply type ***download*** *microcodename*.

(see luc, download.)

mode *[channelmode]|[mode]* - mode will change the processing mode for the given channel. Available modes are:

stare sep chop chop2

A specific channel name and mode can be given, or if there is only one channel, just a mode can be given. If no arguments are present, the user will be prompted for a mode, with the current mode as the default.

"chop" mode causes every other picture to be subtracted from the current one. Only a single image will result. "*chop2*", on the other hand will create three images, object, sky, and difference.

motor control - motors in each instrument are controlled by a set of commands all of which have the same general structure.

“***Devicename”*** *[to | for | whereis | ?pos | alloff | allon | reset]*
[destination | duration]

The device names are defined in the sections for each instrument some example commands are given below:

fpw *to* fpw1, ***fpw*** *to* fpwdark@r, ***fpw*** *to* 256 - these commands all have the same effect the COB focal plane wheel is moved to position 1, called the fpwdark@r, at position 256. As far as is possible all positions on wheels have a wheel position number i.e. *fpw1*, a name i.e. *fpwdark@r* or *k,* and a position encoder value like 256. However in the case of lvf‘’s, cvf’s and similar continuous objects the encoder number or a wave length may be all there is to designate a position.

dso *for* 500 - energizes the Guider darkslide open solenoid for 500 ms.

lws *whereis* or ***lws*** *?pos* - prints the current position of the COB lower slider.

crtl *alloff | allon | reset* - turns all motor controllers off, on or causes a software reset of the motor controller hardware. These commands are not generally needed in normal use. An observer may be asked to type one of these commands if a problem occurs and one of the engineers is debugging over the phone.

movie *[channel] [numframes]* - The “movie” command will take pictures continuously, displaying the given channel or channels listed in the display parameter to the screen. “movie” will not prompt for parameters, the user must have already set them using the various commands or ask. The picture number will not be incremented while running movie, only one file will be generated. The pictures taken in movie will not be archived in any way.

If no channel is specified, the user will be prompted for one. The user can also specify a number of frames to run, or forever (100000) if none is given. To stop the movie, type “end<return>”, and it will end after the current picture has been taken.

(see ask, display.)

newImdir *[dir]* - newImdir will create the given directory if it does not already exist, and make a dir/pixels directory if that does not exist. Then it will change the headerdir to dir, and pixeldir to dir/pixels. Finally, it will cd to the given directory.

If no directory name is given, the user will be prompted for one, with the

current headerdir as the default.
(see pixeldir, headerdir.)

nextpic *[number]* - ***nextpic*** will set the picture index number. If no argument is given, the user will be prompted for a new value and the current value will be used as the default.

observe - observe will first run ask to prompt the user for the various picture parameters, then it will take a picture. observe differs from go only in the fact that it prompts the user for the parameters before taking a picture.
(see ask, go.)

ped - ped will ask all of the parameter questions without regard to the askability of the question (see ask, eask, psave.)

pics *[number]* - pics sets the number of pictures to be taken at each observe/go. If no argument is given, the user will be prompted for a new value with the current value as the default.

pixeldir *[dirname*] - pixeldir sets the directory for IRAF image pixel files. If no directory is given, the current pixel directory will be used as a default. If an invalid directory is given, and error message will be displayed and the old setting will be used.
(set headerdir, newImdir.)

plist - plist will list the current parameters. Same as ppar.
(see ppar.)

ppar *[showNames]* - ppar will list the current parameters that should be listed (see eask). If an argument (any value other than 0) is given, ppar will show the parameter name associated with the parameter.
(see eask.)

psave *[parameterfile]* - psave will save the current parameter set (values and ask/display flags for questions) into a file that can be loaded at a later date using puse. If no filename is given, the current parameter file will be used.
(see puse, lpar.)

puse *[parameterfile]* - puse will load the given parameter file. If nor parameter file is given, the user will be prompted for one, with the current file as the default.
(see lpar.)

raster9 - this command takes 18 pictures (9 on object, 9 on sky) in a three by three grid. The size of the pattern, the distance to the sky are requested from the user before the pattern starts.

readhk - readhk will read out the current housekeeping data from the instrument and display the current screen.
(see status hkscreen.)

resetoffset - This command resets the telescope offset value in the IRAF picture header to 0, 0.

run - run will take the detector out of sdt mode.

NOTE: the user should wait as long as the integration time before attempting to take a picture. Bogus data may result from the next go/observe otherwise.

script *[scriptName]* - script will run a given script file. If no script file is specified the user will be prompted for one.
(see lsc.)

sdt - sdt will put the detector in sdt (simulated data take) mode.
(see run.)

sendParams - sendParams will send the current parameters to the b011, inst, and dspws.

seqStat - read out the number of coadds and lnrs information from the sequencer.

seqTime - list the time values from the sequencer.

set-time *[integration_time]* - *set-time* will set the integration time in seconds. Fractional seconds will be honored down to the millisecond. If the command has no argument the user will be prompted for a new integration time and the current time will be used as a default.
(see delay inttime.)

setparams *parametername [value]* - setparams is a wrapper for all of the parameter setting commands. The following parameters may be set through this procedure:
airmass, coadds, comment, dec, delaysec, display, epoch, filename, headerdir, lnrs, mode, offset, picnum, pics, pixeldir, ra, type, ucode.
(see pics lnrs coadds delay filename headerdir pixeldir mode picnum.)

setdoff *spadnumber value* - setdoff sets the data offset voltage for a single spad card given by spadnumber. The values can range from -5.0 to 5.0 volts. These values remove column chop due to array and electronics differences. The default values in setup are carefully chosen to give the best observing results.
(see setup dsetup setvoff.)

setup *parameterset* - this command sets up the system with the values in the named parameter set. In addition it loads the default microcode, sets the appropriate default voltages and asks if the user would like to activate the array.
(see dsetup, ucode, parameters.)

sky - This command will set the type to sky and ra, dec, and epoch to 0.

spmode *card type value* -- set the operation mode for the Signal Processor/A2D (spad) cards. "***spmode***" will set the mode for a given card. The allowable modes and corresponding values are: mode - efilt, values - f1, f7; 15, mode - gain, values - k1, k2; mode - mref, values - on, off; mode - lights, values - on, off.

standard - sets up the instrument system headers to take a standard.

status *[screenname]* - status is the same as hkscreen.
(see hkscreen.)

tcl - overview of tcl. not yet included

tcpon - This command turns on the requesting and saving of tcp header information. The following values are saved in each image header:
DATE-OBS, ST, UT, HA, RA, DEC, EPOCH, AIRMASS, ZD

tcpoff - this command disables the requesting and saving of tcp header information.

title *[image title]* -- This command changes the title field for new images. If using iraf "imhead" command the title parameter will appear as:
test000h[256,256][real]: title parameter
If no title is given then the user is prompted for a new title.

unfreeze - an alias for ***freeze*** *0*

zs *z1 z2* - set zscale values for IRAF display. ***zs*** will set the zs values that the instrument controller display uses when displaying an image. If the values are 0 and 0 (the default) autoscaling is enabled.

Instrument Specific Commands

COB Related Commands

closeshutter -This command moves the COB focal plane wheel to position 4650 (fpwdark3).

cs - an alias for ***closeshutter.***

dsetup - The default microcode used by COB dsetup is *InsbMed0201*. (see user command section for a complete explanation of dsetup.)

dso - the command used to control the guider dark slide open solenoid.

dsi - the command used to control the guider dark slide close solenoid.

fastcode - This command loads the fast microcode and sets the electronic filters for the current instrument.

fpw - the command used to control the COB focal plane wheel. The valid positions for this wheel are: fpwdark@r, fpw1, slitlets, fpw2, fpwdark1, fpw3, longslit, fpw4, fpwdark2, fpw5, smallhole, fpw6, fpwopen, fpw7, open20mm, fpw8, fpwdark3, fpw9, spot.052, fpw10, spot.076, fpw11, spot.028, fpw12, spot.021, fpw13, fpwdark4, fpw14

hwp - the command used to control the guider half wave plate mechanism.

lfw - the command used to control the COB lower filter wheel. The following positions are valid: lfwdark@r, lfw1, 1.08*, lfw2, 1.25, lfw3, 1.28, lfw4, 1.64*, lfw5, 1.99, lfw6, 2.12**, lfw7, 2.16**, lfw8, 2.22**, lfw9, 2.36**, lfw10, 2.38, lfw11, lfwpol, lfw12, k'*, lfw13, 4.00, lfw14, 4.05, lfw15, lfwopen, lfw16
* use with upper filter wheel position ufw23?
** use with upper filter wheel position ufw12 or 13.

lsw - the command used to control the COB Lyot stop wheel.

lws - the command used to control the COB lower slider.

medcode - This command downloads the medium speed microcode and set the electronic filters for the current instrument.

openshutter-This command moves the COB focal plane wheel to position 4115 (open20mm).

os - an alias for ***openshutter.***

setbias *value* - set the detector bias to a voltage. value is the voltage in volts to which the detector bias should be set. The range of value is 0 to 1.2 volts. The default value is .6 volts for the InsbMed0201 microcode. The default value is 1.0 volts for the InsbFast0201 microcode.

setvoff *value* - set the voff to a given value. value is the voltage in volts to which the VOff voltage should be set. The range of value is 0 to 5.0 volts. The default value is .55 volts.

slowcode - download the slow code and set the electronic filters for the current instrument.

ufw - the command used to control the COB upper filter wheel. The following positions are valid: ufwplug@r, ufw1, ufwplug1, ufw2, ufwplug2, ufw3, ufwplug3, ufw4, ufwplug4, ufw5, onemicron, ufw6, j, ufw7, h, ufw8, h+, fw9, k, ufw10, k+, ufw11, 2umblocker, ufw12, 2umpol, ufw13, 3.08, ufw14, 3.30, ufw15, 3.35, ufw16, 3.40, ufw17, l, ufw18, l', ufw19, m, ufw20, 5.02, uw21, 5.06, ufw22, pk50, ufw23, ufwopen, ufw24

ups - the command used to control the COB upper slider.

IRIM Related Commands

dsetup - The default microcode used by IRIM dsetup is *NicmMed0101*. (see user command section for a complete explanation of dsetup.)

fwl - the command used to control the IRIM filter wheel. The filter wheel has the following filters: dark, fw1, 2.12, fw2, 2.16, fw3, j, fw4, 2.22, fw5, 2.36, fw6, h, fw7, k, fw8.

setbias *value* - set the detector bias to a given voltage. value is the voltage in volts to which the detector bias should be set. The range of value is 0 to 1.0 volts. The default value is .4 volts.

setscb *onbitlist offbitlist* - sets the static control bit register in the instrument controller. onbitlist is a list of one or more bits to be turned on. offbitlist is a list of one or more bits to be turned off. The command is used to control the SCB register in the IRIM instrument. It is used to command certain bits from the TCL to control data transfers to the DSP box. The valid values are: all, none, selmotor0data, enblmotorrst, selcicoutput, seledodac, selododac, selhkhiaddr, selhkdata, selhkaddr, seldbus, enbldetbias, selardata, sellofilt, selvoffdac, selvdtdac, databus

This command is only needed when developing new code to take data with IRIM. DO NOT USE UNLESS AUTHORIZED TO DO SO.

setvoff *value* - set the voff to a given value. value is the voltage in volts to which the VOff voltage should be set. The range of value is 0 to 5.0 volts. The default value is 4.12 volts.

SQIID Related commands

calc - is the integration time/coadds calculator. Calc will allow the user to determine the maximum l integration time or the maximum number of coadds in l for a given integration time in jhk. Calc prompts for all necessary values.

If you want a certain number of coadds in l, you can answer the questions like this:

```
% calc Integration time for jhk [5]: 6
  Integration time for l [none]:
  Desired l coadds [1]: 2
  Use an l integration time of 0.8.
```

If you want a certain integration time in l, answer like this:

```
% calc Integration time for jhk [6]: 6
  Integration time for l [none]: .8
  The number of l coadds possible is 2.
  An integrate time of 8.32 in jhk would give another l coadd.
```

The values that you give (or are calculated) are set in the parameters.

dsetup -- The default microcode for all SQIID arrays is *sqdptsi*.

setbias *anum value* - set the detector bias for a requested array. setbias will set the detector bias voltage level in the requested array (anum) to the specified value. Valid array numbers are (name or number is valid): all, -1, h, 0, j, 2, k, 1, l, 3.

setdoff *anum type value* - sets the output voltage level for an a2d channel for one array. anum is number of the array to set where h = 0, k = 1, j = 2 and l = 3. type is the type of doff to set and is the either 0 or 1, 0 is the even columns, 1 is the odd columns. value is voltage level to set. An anum value of -1 will set all arrays.

spmode *card type value* - will set the mode bits on the signal processor/a2d (spad) cards. spmode will set the spad mode for a given card. If the card is -1, all cards will be set. The allowable types and values are:

TYPE	VALUES
efilt	hi, lo, high, low, f25, f10
gain	hi, lo, high, low,

sqiid - sets the telescope to the instrument position. “sqiid” positions the telescope so that the instrument is pointed at the object being observed. The user needs to set the variable *itvoffset* to the amount of the offset at the beginning of each run. Use “***set*** *itvoffset {east_arcsecs north_arcsecs}*” to set the offset. The default offset is 1050 arc seconds.

sqtv - sets the telescope to the off axis tv camera position. “sqtv” positions the telescope so that the off axis tv camera is pointed at the object being observed. The user needs to set the variable *itvoffset* to the amount of the offset at the beginning of each run. Use "***set** itvoffset arcseconds*" to set the offset. The default offset is 1050 arc seconds.

CRSP Related Commands

?lambda - This command reads back the value of the grating angle in terms of order and wave length. The order used is the last order set using the *lambda* command or order 0 if no lambda has been issued since the last instrument restart.

?sangle - This command reports the angle of the slit on the sky. The angle ranges from 0 to 180 degrees, where 90 degrees is north-south.

chgrat - This command moves the grating to the grating change position, (encoder position 4000.) This allows the user to switch between the various resolution gratings.

dsetup - The default microcode used by CRSP dsetup is *CrspMed01_01*. (see user command section for a complete explanation of dsetup.)

filt - This command is used to control the CRSP filter wheel. The filter wheel has the following filters: 1, l, 2, k, 3, h, 4, j, 5, i.

grat - A low level motor command which can be used to change the grating angle. It is best to use the *lambda* command*.*

***lambda** order wave_length -*

rot - A low level motor command which can be used to change the rotator angle. It is best to use the *sangle* command

***sangle** angle* - This command is used to orient the slit to a certain angle on the sky. The allowed angles range from 0 to 180 degrees, where 90 degrees orients the slit north-south.

***setbias** value* - This command is used to set the detector bias to a given voltage. *value* is the voltage in volts to which the detector bias should be set. The range of value is 0 to 1.2 volts. The default value is .6 volts for the CrspMed01_01 code.

***setscb** onbitlist offbitlist* - sets the static control bit register in the instrument controller. onbitlist is a list of one or more bits to be turned on. offbitlist is a list of one or more bits to be turned off. The command is used to control the SCB register in the CRSP instrument. These bits control data transfers from the instrument to the DSP box. The valid values are: all, none, selmotor0data, enblmotorrst, selcicoutput, seledodac, selododac, selhkhiaddr, selhkdata, selhkaddr, seldbus, enbldetbias, selardata, sellofilt, selvoffdac, selvdtdac, databus

This command is only needed when developing new code to take data with CRSP. DO NOT USE UNLESS AUTHORIZED TO DO SO.

***setvoff** value* - set the voff to a given value. value is the voltage in volts to which the VOff voltage should be set. The range of value is 0 to 5.0 volts. The default value is 0.95 volts.

slit - the command used to control the CRSP slit width mechanism. The slit width has the following valid postions: 1, 610um, 610, 2, 510um, 510, 3, 380um, 380, 4, 270um, 270, 5, 125um, 125.

Telescope Related Commands

boaa *rasecs decsecs*- move the telescope in a given direction using the guide probes. rasecs is the number of arcs seconds to move in RA (east is positive west negative.) decsecs is the number of arc seconds to move in DEC (north is positive south negative).

east *[arcsecs] -* This command tells the TCP to move the telescope east the given number of arcseconds. This also updates the offset value stored in the picture header.

north *[arcsecs] -* see east above. Moves the telescope north.

npos *[arcsecs north] [arcsecs east] -* moves the telescope north and east and pauses a three seconds before returning.

south *[arcsecs] -* see east above. Moves the telescope south.

toaa *rasecs decsecs*- move the telescope in a given direction without using the guide probes. rasecs is the number of arcs seconds to move in RA (east is positive west negative.) decsecs is the number of arc seconds to move in DEC (north is positive south negative).

tcp *[on|off] -* tcp values in the headers are disabled by default. To enable tcp headers, type tcpon. tcpoff will disable the values again. The following values are saved in each image header:

DATE-OBS ST UT HA RA DEC EPOCH AIRMASS ZD

toffset *[arcsecs east] [arcsecs north] -* moves the telescope east (east is positive west negative) and north (north is positive south negative)and pauses a three seconds before returning.

west *[arcsecs] -* see east above. Moves the telescope west.

Software Developer Commands

ed *procName* - ed allows the developer to create new procedures and edit already existing ones. If the procedure already exists, it is saved to disk and the developer's editor is run on it. If the procedure does not exist, a new blank procedure is created and the editor is run on it. In either case, once the editor terminates, the file is read back in.

(see save editor automkindex.)

editor *fileName* - editor will run the developer's editor on a given filename. It will check the value of the EDITOR environmental variable, and if it exists, use that editor; otherwise it assumes vi. A new window is created to edit the file, and when the editor exits, the window is destroyed. In the case of epoch, it creates it's own window, so no window is created for it.

err - err will print out error traceback information.

System Commands

?time - This command gives the current settings of the integration time, read out time and fdelay time. In addition it will read back these times from the sequencer to insure the value has been set properly.

>det *paramsIndex* **-** convert a params() variable into several params variables based on the channel names. For example:

```
>det pics
```

will convert the params(pics) variable into params(pics$detNames) for each element in detNames.

buftrace - This command turns on trace information concerning the picture buffers in the dspws. This is used as a diagnostic technique.

autoexecok - This command checks to see if a name can be executed. autoexecok returns a 1 if the name is executable.

autoload *[cmd]* -

automkindex *dir pattern* - automkindex will update the autoload index for the given directory. This should be done any time that a new command is created. To create an index for the main tcl directory, you would type (assuming you are in the tcl directory): automkindex. *.tcl

To create an index for a specific instrument (same dir assumptions): automkindex CryoBench *.tcl

autoreset - resets the auto load information.

checkmem - this command checks the TCL memory. This will cause bad things to happen if used incorrectly. (DO NOT USE! AUTHORIZED MAINTENENCE PERSONNEL ONLY.)

checkpicture - checks the parameters for a picture to insure the parameter combination is valid.

canonizefiles - change all files in a directory into canonical form, i.e. lowercase no special characters.

checkFileName *new old* - check whether the picture file name has been changed. Check if the designated basename exists. Warns against writting over files.

docode *[speed]* - this command downloads the default code of the desired speed and executes the commands associated with that code speed. The allowed speeds are fast, med or slow

For IRIM and SQIID all speeds load the same microcode.

getheader - This command queries the TCP computer and attempts to get the tcp data. If the TCP computer does not respond a ***TCP*** *off* command should be issued to avoid the long delays caused by the time-out values used in waiting for the TCP data.

hdwtrace *level node* - This command sets the trace flag in the low level nodes to the value level. The higher the value the more information will be printed. (DO NOT use a value greater than 45 without executing a ***freeze*** *1* command.)

i?spmode - This is the low level command which queries the instrument about the state of the spad cards.

initInst - This command is called upon start-up to initialize the instrument. The commands should execute in an uplevel statement. The following should be defined:

- detNames -- detector names (channel names). if there is only one channel, the name should be only.
- dspNames -- names of all of the active dsp workers
- map(detNames) -- a mapping from the channel names to the dspw names.
- startCount -- number of channels
- queueCount -- 0, used to count finished channels
- paramDir -- directory for.par files
- ucodeDir -- directory for ucode (.tld) files
- scriptDir -- directory for script (.sc) files
- paramList -- all of the parameter names that should be saved,
- prompted for, and listed.

✍tmp(paramList) -- temporary storage for each parameter

✍temp -- a temporary variable

This command should also execute a ***puse*** on the default parameter file. Here is a sample initInst:

```
proc initInst {} {
    uplevel {
            # put these in detSetup
            # the names of all the channels
            set detNames {only}
            # the names of all the dsps
            set dspNames {dspl0}
            # the a mapping from the channel names to dsp names
            set map(only) {dspl0}
            # a count of the picture queues (== channels)
            set startCount 1
            set queueCount 0

            # paths for finding various files
            set paramDir /source/wfire/tcl
            set ucodeDir /source/wfire/ucode
            set scriptDir /source/wfire/tcl/scripts

            # all the parameter names that are saved/prompted for/listed
            set paramList {coadds lnrs pics delaysec filename headerdir
                                        pixeldir mode picnum ucode display}

            # setup various temp variables for further use
            foreach x $paramList {
              set tmp($x) ""
            }
            set temp ""
            # load the initial parameters/questions
            puse params.par
    }
}
```

ld *[ucodename]* - This downloads the given microcode. The current ucode (if any) is not killed, and the downloaded code is not started.

(see startucode.)

logtemps *[seconds]* - This command starts the saving of a continuous log of the instrument temperatures. The seconds parameter tells how often the temperatures should be read. The default value is 300 seconds (5 minutes). NOTE: The instrument system will be unusable as long as this process is running.

noinc *channelnames [on|off]* - noinc will disable (default) or enable the incrementing of picture numbers for the given channels.

parray *arrayname* - parray will display all of the entries in the given array.

ping *[node]* - ping will send a readvar message to the given transputer node (b011 by default) and wait for a reply.

pupdate *<files>* - This command updates parameter files. This will add any new questions/parameters to a parameter file.

q *questionListName [startindex]* - q will ask a list of questions and return the index of the current question when the user goes off the top or bottom. qed can be used to create a single question. The questionListName should be the name of a list of question(s).

(see qed.)

qed - qed can be used to edit an existing question or create a new one. The following fields must be specified:

```
Flags (0 = disp, 1 = ask): 3
Variable name: name
Description:
Prompt:
Default value:
pre question Proc:
post question Proc:
```

qed would return {3 name {}: {} {} {}} given the above fields.

r***eadHeader*** *name* - readHeader will read the header variable with the given name from the b016 and display it's value.

NOTE: this will create the variable if it does not exist!

receive *[-p] [-r varname] [-q] [-a] [-ctype]* - receive a message from the transputers system.

```
/****************************************************************************
 * Routine: receive
 * Purpose: receive a message from the transputers (using the protocol as
 *          described in protocol.h)
 * Inputs: receive [ -p ] [ -r varname ] [ -q ] [ -a ] [ -ctype ]
 *          -p -- poll (i.e. return right away if there is no data)
 *          -r varname -- wait for a variable with the given name
 *          -q -- quiet mode
 *          -a -- wait for an akk message
 *          -c{type} -- conversion on data (to int is the default)
 *                   d -- int
 *                   s -- string
 *                   x -- hex
 *                   f -- float
 * Returns: data from the message in some usable format
 *
 ****************************************************************************/
```

rehash - rehash will reset the completion data to contain the current procedures, commands, and global variables.

save *procName [fileName]* - save will list the given procedure to stdout or a specific file name.

saveinst *{filename]* - saveinst saves the current instrument configuration (as defined by the configuration, see below). It generates a script that will set the state back to the current one.

```
# stuff for saving instrument state
# 0 == no save, 1 == save
set save(ucode) “0”
# a list of spad cards
set save(spads) { 0 }
set save(spadmode) “0”
# a list of dacs to save
# { anum gnum inum index }
set save(dac) { }
# a list of servo vars to save
set save(servo) { }
# a list of lcd vars to save
set save(lcd) { }
```

send *command [data ..] <list of node names>* - send a message to the transputer(s). The available commands are listed below. The data should be of the form:

variableName [(subscript)] or -i <integer> or -s <string> or -f <float>

The available commands are: imagedone, beginxmit, setvar, readvar, debugmsg, abortmsg, stopmsg, startmsg, pause, resume, varread, readhk, setvarak, akk, akkfail, killproc, executeproc, checkhk, error,

NOTE: not all of these make sense for every transputer in the system, anyone who uses this command better know what they are doing.

All transputers have these variables: traceflag

The variables for the dspw are: frames, received, prog, imagesize, lnr, coadds, mode.

The b016 variables are: pfilename, ppath, pnum, ppixeldir, hname, hform, hdata, hcomm, hkdata, hkscreen, pmode, phk, hksave, curdisp, imlist, ppos.

The inst variables are: numarrays, echome, statusreport, deactivate, hkbuf, protection, scbregval, camerapower, arrayd2a, servo, filters, a2dfreeze, spadmode, wheelpos.

The seq variables are: cntrlreg, inttime, finttime, spadfilter,

The available node names are (some are synonyms): b011, b016, seq, inst, dspl0, dspr0, dspl1, dspr1, dspl2, dspr2, dspl3, dspr3,

setHeader *name format data [comment]* - setHeader will set the given header information on the b011. The available formats are: -f -- float, -i -- integer, -s -- string

(see readHeader.)

setdac *arraynumber grpnum indexnumber value -* This command access the dac's in the instrument directly. Detailed knowledge of the structure of the instrument is needed to use this command. Each instrument has a different set of dac's. In general these should be accessed using the USER level commands in the previous sections.

setoffset - This command turns the current offset into a string.

startucode - startucode sends an executeproc message to the sequencer.

takePicture - takePicture takes the number of pictures specified by params(pics) and waits for it to finish. All of the parameters are assumed to have been send using sendParams.

waitForDone - waitForDone waits until all of the pictures that should be taken have been uploaded to the b011.

Appendix I.

From merrill@mira Fri Dec 10 14:11:24 1993 Date: Fri, 10 Dec 93 14:11:14 MST From: merrill@mira (Michael Merrill) To: buchholz Subject: WILDFIRE recovery" Content-Length: 27475

Here is my current version of WILDFIRE recovery procedures. "itrofflwn -ms filename" where "n" is the laser printer number would print it out. Please check for accuracy and let me know whatever mods or additions are required.

WILDFIRE System Recovery Procedures The following procedures are intended to assist the user of the KPNO Infrared Instrumentation System WILDFIRE with recognizing and diagnosing a variety of computer, IRAF, and WILDFIRE system failure modes. Specific recipes are given for restoring the system to full operation.

The situations covered include:

resurrecting IMTOOL/SAOIMAGE

resurrecting GTERM/XTERM

re-engaging an unresponsive GTERM/XTERM/IMTOOL/SAOIMAGE

stopping an unresponsive movie sequence

re-engaging an unresponsive mouse

resurrecting the WILDFIRE IMAGE SAVER PROCESS

unresponsive WILDFIRE CONTROL

WILDFIRE RESTART procedures

when the INSTRUMENT STATUS window has vanished

simple (WARM) RESTART

stalled system (WARM) RESTART

WARM RESTART after instrument computer re-boot

COLD RESTART after instrument power interruption

COLD RESTART after dsp heurikon box power interr- uption

SUN computer re-boot

RESURRECTING IMTOOL/SAOIMAGE

If the "IRAF" imtool (saoimage) image display window has disappeared, first look for its icon to see if it has merely been closed. If you find the icon, click on it with the left mouse button to re-open it. If you can't find the icon, type "ps" in any available window and look for the imtool (saoimage) display task. If you can't find it, the imtool (saoimage) display task has died.

NOTE: Temporary loss of the display task does not effect the WILDFIRE control process itself in any way. You can continue to take data while you sort things out.

As noted below, you might have to kill multiple “display” tasks after order is restored. Within the WILDFIRE observe task, selecting “none” for the “channel to be displayed” query will turn off the automatic display.

If the “IRAF” imtool (saoimage) image display window has died, you can restart it by either selecting “imtool” from the WILDFIRE submenu within the Sun main menu or go to the console window and type:

```
imtool & <return>
```

or

```
saoimage & <return>
```

to restart the process and get a new IMTOOL (SAOIMAGE) display window. Type =imcur within IRAF in the GTERM win- dow. The window will reopen and display the image cursor. Type “<return>” in the imtool window to get back to GTERM. Move the imtool window for more convenient placement. (Move the arrow cursor to the edge of the window and “grab” onto it by holding down the middle mouse button; “drag” the win- dow where you want it and release the middle mouse button)

Verify that there are no pending “display” tasks by typing:

```
irafproc <return>
```

in the GTERM or WILDFIRE CONTROL windows. Look for the “display” process in the resulting output. Kill all pending “display” process using the “kill -9 PID” command, syntax where “PID” is the number (leftmost entry on the line where the display task appeared) of the process you need to kill.

NOTE: The most likely reason for the imtool window to vanish is that two sessions were trying to display to it simultaneously - for instance the WILDFIRE automatic display option and an imexamine - there is a fairly narrow window at the start of a display when clobbering the imtool data stream will confuse the imtool to the point that it will choose to kill itself rather than enter some unpredictable state. After the imtool is successfully configured for a new image, the remainder of the data, no matter how con- fused, will just look like pixels. (Actually, due to buffering there will tend to be interleaved bands from the two images.)

RESURRECTING GTERM/XTERM

If the IRAF gterm (xterm) window has died, you can restart it by either selecting “gterm” (“xterm”) from the WILDFIRE submenu within the Sun main menu or go to the con- sole window and type:

```
gterm & <return>
```

or

```
xterm & <return>
```

to get a new GTERM (XTERM) window. Then type “cl <return>” in the window to restart IRAF. Finally change back to the appropriate directory.

RE-ENGAGING AN UNRESPONSIVE GTERM/XTERM/IMTOOL/SAOIMAGE

If IRAF has hung or has otherwise gotten lost or con- fused inside its GTERM/IMTOOL (XTERM/SAOIMAGE) and graphics windows, you can use whatever it takes in the way of <CTRL- C>, logout, or kill commands on the appropriate IRAF processes to regain control.

Start by attempting a <CTRL-C> in each of the IMTOOL (SAOIMAGE), GTERM (XTERM), and graphics windows (select “show graph” from the GTERM menu as needed to re-display the graph). If you regain control, type:

flprc <return> in the GTERM window and resume opera- tions.

You can freely quit IRAF at any time by typing:

logout in the IRAF GTERM (XTERM) window

and restart IRAF by typing:

cl <return> in the IRAF GTERM (XTERM) window.

NOTE: The most likely reason for the imtool window to hang is that two sessions were trying to display to it simultane- ously - for instance the WILDFIRE automatic display option and an imexamine. There is a fairly narrow window the at the start of a display when clobbering imtool data stream will confuse the imtool to the point that it will choose to kill itself rather than enter some unpredictable state. After the imtool is successfully configured for a new image, the remainder of the data, no matter how confused, will just look like pixels. (Actually, due to buffering there will tend to be interleaved bands from the two images.)

RE-ENGAGING AN UNRESPONSIVE MOUSE

If you have lost control of the mouse, the most likely candidate is IRAF. You can restore control as follows:

o+ Login remotely to the WILDFIRE control system (berry at the 1.3m) as “ir50inch” from whatever computer sys- tem is readily available to you.

o+ Type irafproc <return> (or “ps -a <return>” if “iraf- proc” doesn’t work) and examine the IRAF processes run- ning.

o+ Kill whichever IRAF processes you need to regain con- trol of the mouse, starting with the display and then the imexam process and continuing with the rest as needed. As soon as you regain control of the mouse, exit (type “logout <return>”) re-start IRAF (type “cl <return>”) if necessary in its GTERM window and resume.

STOPPING AN UNRESPONSIVE MOVIE SEQUENCE

If the movie sequence has hung (you have tried pressing <return> in the WILDFIRE control window several times, but the new images just keep coming in)

o+ type exit <return> in the WILDFIRE control window.

Then complete the following SIMPLE RESTART sequence to get back to full operational control:

When you see the “berry” prompt in the INSTRUMENT CONTROL window, you can re-start the system as follows. In the INSTRUMENT CONTROL window:

o+ type go SQIID <return>

o+ answer y <return> to the question “Do you want windows?”

o+ type setup sqiid <return> . The system output will pause (order one minute) after it has issued one or more “running” statements and then resume

o+ answer y <return> to the question “Do you want to activate the array?” (if you failed to answer “y”, you can activate the detectors by typing activate <return> when you see the “%” prompt). [Note: SQIID has no button to push.]

o+ type puse parameterfile to restore the saved parameterfile, including the “eask” choices (type puse sqiid if you don’t remember what it was)

o+ use “ped” or “ask”, paying special attention to the “header directory”, “pixel directory”, “filename tem- plate”, “display”, and “picture index” values to verify that the images will be going where you want them

You should now be able to continue with your observing.

RESURRECTING THE WILDFIRE IMAGE SAVER PROCESS

If the WILDFIRE image saver process has died, go to the WILDFIRE housekeeping STATUS window and type:

saver v & <return>

to restart the process and adopt the window (the one you just typed in) for output. Don’t panic if you used the WILDFIRE control window or a shelltool by mistake. You can create a new shelltool from the main Sun menu. The resultant choice of output window might be inconvenient, but will not be destructive. You can restart the saver process at any time you need to re-start it. In particular, if saver has died during an observation (e.g., it might have run out of diskspace), and as a consequence the WILDFIRE control has hung (waiting to complete the save), you can restart saver without resorting to a RESTART to regain control of WILDFIRE. (Reset the WILDFIRE pixeldir or make space within the existing WILDFIRE pixeldir by typing “newImdir” in the WILDFIRE window and type in an appropriate directory as needed before restarting saver).

UNRESPONSIVE WILDFIRE CONTROL

If the WILDFIRE control process has hung or died, fol- low the appropriate RESTART procedures described below to resume operations as needed:

1) If the power to the cooler heads goes down but the com- puter power is unaffected, the WILDFIRE electronics should still be running and WILDFIRE control should not be affected. Do not cycle power on the DSP and SQIID electronics if only the cooler power goes off or glitches.

2) If WILDFIRE control is lost, follow the appropriate WARM RESTART procedure described below to resume opera- tions.

3) Use the COLD RESTART procedures described below only when problems taking data appear after a power glitch and the WARM RESTART procedures described below

do not fix the problem. BE CONSERVATIVE!!! Turning off the power to the SQIID electronics should be used as a last resort, if all other attempts to restart fail. Should it become necessary to cycle the power or if a power failure causes hardware or software problems the appropriate COLD RESTART procedure below should be used to power up the system.

WILDFIRE RESTART PROCEDURES

The following procedures are intended as a guide for restoring the WILDFIRE system following varying levels of system failure:

o+ when the INSTRUMENT STATUS window has vanished

o+ simple (WARM) RESTART

o+ stalled system (WARM) RESTART

o+ WARM RESTART after instrument computer re-boot

o+ COLD RESTART after instrument power interruption

o+ COLD RESTART after dsp heurikon box power interruption

Re-booting the computer and cycling power to the instrument, the SUN instrument computer berry, or the DSP in the Heurikon box within berry's rack in the com- puter room) are not of normal WILDFIRE/SQIID operations and should not be done without proper consultation.

Follow the procedures labeled "WARM" when you are restarting

WILDFIRE when the WILDFIRE system (DSP electronics and/or SQIID electronics) has not been powered down and the pro- cedures labeled "COLD" when all or part of the WILDFIRE sys- tem has been powered down.

After a warm restart the, dark current might be a bit high (about a factor of two) for a while. This elevated dark should decay away back to normal within the hour. After a cold restart (whereby the detector has been de- activated and the entire system been re-energized), the dark current might be quite high (a factor of ten or more) for a while. This highly elevated elevated dark should decay away back to within a factor of two high within an hour and be back to normal after an additional hour has elapsed

Typical SQIID WARM RESTART session (user action in bold print):

go SQIID Do you want windows? [n] y LD-NET (Network Loader), Version 89.1 [Link I/O Driver: 'SCIO'] Copyright (c) 1986-1989 by Logical Systems

Loading first phase of bootstrap to root node 1 Finished loading first phase, awaiting first acknowledge Loading second phase of bootstrap to root node 1 Bootstrap loaded, awaiting acknowledge Successfully bootstrapped root node 1

Bootstrapping the remainder of the network: Bootstrapping node 100 Bootstrapping node 101 Bootstrapping node 102 Bootstrapping node 103 Bootstrapping node 203 Bootstrapping node 202 Bootstrapping node 201 Bootstrapping node 200 Bootstrapping node 2 Bootstrapping node 50 Bootstrapping node 51 Bootstrapping node 10 Bootstrapping node 11 Network successfully bootstrapped

Downloading program: ../tld/SQIID/b011.tld Downloading program: ../tld/SQIID/inst.tld Downloading program: ../tld/SQIID/seq.tld Downloading program: ../tld/SQIID/dspw.tld Program downloading completed

WILDFIRE SYSTEM CONTROL LAST BUILT: Wed Sep 1 13:08:36 MST 1993 [1] 21194 in time for j = 0.44. in time for h = 0.44. in time for k = 0.44. in time for l = 0.44. NOTE: all paramters should be given in jhkl order. Be sure to set itvoffset before using sqtv or sqiid.

% setup sqiid in time for j = 0.44. in time for h = 0.44. in time for k = 0.44. in time for l = 0.44. Killed. Killed.

Killed. Killed. in time for j = 0.44. in time for h = 0.44. in time for k = 0.44. in time for l = 0.44. 0 128 256 384 512 640 768 896 1024 1152 1280 1408 running running running running [NOTE: system output will pause here of order a minute before resuming] Array 0, Even Data Offset 0 set to 0.088 Array 1, Even Data Offset 0 set to 0.285 Array 2, Even Data Offset 0 set to 0.052 Array 3, Even Data Offset 0 set to 1.005 Array 0, Odd Data Offset 0 set to -0.019 Array 1, Odd Data Offset 0 set to -0.019 Array 2, Odd Data Offset 0 set to -0.010 Array 3, Odd Data Offset 0 set to -0.019 setbias: rvalue 1.478925 Array 0, Detector Bias 0 set to 3.007 setbias: rvalue 1.506375 Array 1, Detector Bias 0 set to 3.010 Do you want to activate the array? (y or [n]) y setbias: rvalue 1.521930 Array 2, Detector Bias 0 set to 3.009 setbias: rvalue 1.525285 Array 3, Detector Bias 0 set to 3.009 Push the button, Max! [NOTE: SQIID has no button to push] % Array 1 activated, Array 2 activated, Array 3 activated, Array 4 activated,

% ask Integration time (s): [5 5 5 1] 5 5 5 2 Filename: [test%03d%s] n1s001 Header Directory: [/data2/ir50inch/sqiid1] Pixel Directory: [/data2/pixels] Picture index: [0 0 0 0] 1 % display j Now displaying j. % plist Number of coadds 1 1 1 1 Number of lnrs 1 1 1 1 Number of pictures 1 Integration time (seconds) 5 5 5 2 Filename template n1s001%03d%s Header Directory /data2/ir50inch/sqiid1 Pixel Directory /data2/pixels Process mode stare stare stare stare

Picture index 1 1 1 1 Microcode sqdptsi Channels to display j RA of object 0:00:00 DEC of object 0:00:00 EPOCH of object 1950 Observation offset 0 Type of observation object Current airmass 1 Object name dark Comment none Image name list file /tmp/list Title Header Var 1 Header Var 2 Header Var 3 Header Var 4

INSTRUMENT STATUS WINDOW HAS VANISHED:

If the INSTRUMENT STATUS window has vanished, you should first check to see if it has simply been closed. Type ‘fireproc’ from an active window (type ! fireproc if the command is not found) and look for the sundaemons process.

If the process is present, the window has been closed and you need to find it and open it (if the icon is not visible, then it is probably behind one of your open windows). Inside OpenWindows, you can check the “windows” item in the menu for the status of all operating windows. If the Instrument Status window is present, open it, and continue with your observing.

If the Instrument Status window has died, perform the Simple Restart procedure listed below.

SIMPLE (WARM) RESTART:

(NOTE: if the power to the instrument and/or the DSP Heuri- kon box in the computer room has been interrupted or the computer has been re-booted, this procedure might fail. Look below for more specific procedures.)

If WILDFIRE has crashed (INSTRUMENT STATUS window has van- ished (and could not be found by the above procedure) and/or the “berry” prompt has returned to the INSTRUMENT CONTROL window) the following steps should restore operation within the INSTRUMENT CONTROL window:

o+ If you see the “%” prompt, first type “exit” to cleanly exit the processes and get the “berry” prompt.

When you see the “berry” prompt in the INSTRUMENT CONTROL window, you can re-start the system as follows. In the INSTRUMENT CONTROL window:

o+ type go SQIID <return>

o+ answer y <return> to the question “Do you want windows?”

o+ type setup sqiid <return> . The system output will pause (order one minute) after it has issued one or more “running” statements and then resume

o+ answer y <return> to the question “Do you want to activate the array?” (if you failed to answer “y”, you can activate the detectors by typing activate <return> when you see the “%” prompt). [Note: SQIID has no button to push.]

o+ type puse parameterfile to restore the saved parameterfile, including the “eask” choices (type puse sqiid if you don’t remember what it was)

o+ use “ped” or “ask”, paying special attention to the “header directory”, “pixel directory”, “filename tem- plate”, “display”, and “picture index” values to verify that the images will be going where you want them

You should now be able to continue with your observing.

STALLED SYSTEM (WARM) RESTART:

If WILDFIRE is hung (INSTRUMENT CONTROL window unresponsive and data collection stalled):

o+ type <control C> <control C> in the INSTRUMENT CONTROL window

o+ type hung several (2 or 3) times in the CONSOLE WINDOW until either the WILDFIRE “%” prompt or the UNIX “berry” prompt returns in the INSTRUMENT CONTROL window.

o+ if you see the “%” prompt first, type exit <return> in the INSTRUMENT CONTROL window; the berry prompt will return.

When you see the “berry” prompt in the INSTRUMENT CONTROL window, you can re-start the system as follows. In the INSTRUMENT CONTROL window:

o+ type go SQIID <return>

o+ answer y <return> to the question “Do you want windows?”

o+ type setup sqiid <return> . The system output will pause (order one minute) after it has issued one or more “running” statements and then resume

o+ answer y <return> to the question “Do you want to activate the array?” (if you failed to answer “y”, you can activate the detectors by typing activate <return> when you see the “%” prompt). [Note: SQIID has no button to push.]

o+ type puse parameterfile to restore the saved parameterfile, including the “eask” choices (type puse sqiid if you don’t remember what it was)

o+ use “ped” or “ask”, paying special attention to the “header directory”, “pixel directory”, “filename tem- plate”, “display”, and “picture index” values to verify that the images will be going where you want them

You should now be able to continue with your observing.

WARM RESTART AFTER INSTRUMENT COMPUTER RE-BOOT:

If the instrument computer has been rebooted (but the black DSP Heurikon box within berry’s rack in the computer room has remained on):

o+ login as “ir50inch” on the instrument computer (berry) with password

o+ answer <return> to the “term” prompt then,

o+ if you want to use Sunview, type “st” or,

o+ if you want to use Openwindows, then type “op”.

o+ start IRAF by typing “cl < return>” in the IRAF Gterm/Xterm window.

When you see the “berry” prompt in the INSTRUMENT CONTROL window, you can re-start the system as follows. In the INSTRUMENT CONTROL window:

o+ type go SQIID <return>

o+ answer y <return> to the question “Do you want windows?”

o+ type setup sqiid <return> . The system output will pause (order one minute) after it has issued one or more “running” statements and then resume

o+ answer y <return> to the question “Do you want to activate the array?” (if you failed to answer “y”, you can activate the detectors by typing activate <return> when you see the “%” prompt). [Note: SQIID has no button to push.]

o+ type puse parameterfile to restore the saved parameterfile, including the “eask” choices (type puse sqiid if you don’t remember what it was)

o+ use “ped” or “ask”, paying special attention to the “header directory”, “pixel directory”, “filename tem- plate”, “display”, and “picture index” values to verify that the images will be going where you want them

You should now be able to continue with your observing.

COLD RESTART AFTER INSTRUMENT POWER INTERRUPTION:

If the power to the instrument was interrupted (but the black DSP Heurikon box within berry’s rack in the computer room stayed on and the computer was not re-booted), in the INSTRUMENT CONTROL window:

o+ type powerup SQIID <return>

o+ when instructed, turn on power to the instrument

o+ answer y <return> to the question “Do you want windows?”

o+ type setup sqiid <return> . The system output will pause (order one minute) after it has issued one or more “running” statements and then resume

o+ answer y <return> to the question “Do you want to activate the array?” (if you failed to answer “y”, you can activate the detectors by typing activate <return> when you see the “%” prompt). [Note: SQIID has no button to push.]

o+ type puse parameterfile to restore the saved parameterfile, including the “eask” choices (type puse sqiid if you don’t remember what it was)

o+ use “ped” or “ask”, paying special attention to the “header directory”, “pixel directory”, “filename tem- plate”, “display”, and “picture index” values to verify that the images will be going where you want them

You should now be able to continue with your observing.

o+ “setup sqiid”, answering “y” to the question about detector activation

o+ “puse parameterfile” to restore the parameterfile you had been using (type “puse sqiid” if you don’t remember what it was)

o+ use “ped” or “ask”, paying special attention to the “pixeldir”, “headerdir”, filename, and nextpix values to verify that the images will be going where you want them

You should now be able to continue with your observing.

COLD RESTART AFTER DSP HEURIKON BOX POWER INTERRUPTION:

If the black DSP Heurikon box in berry’s rack in the com- puter room box has been powered down, then you must:

o+ turn off power to the instrument

o+ verify that the DSP box is turned on

o+ reboot the instrument computer (berry) by typing <L1 A> or <Stop A>

o+ login as “ir50inch” on the instrument computer (berry) with password

o+ answer <return> to the “term” prompt then,

o+ if you want to use Sunview, type “st” or,

o+ if you want to use Openwindows, then type “op”.

o+ start IRAF by typing “cl <return>” in the IRAF Gterm/Xterm window

In the INSTRUMENT CONTROL window type:

o+ “coldstart” (If it takes longer than a few seconds to complete, a major problem has occurred and you should turn off the DSP box and start this procedure again.)

o+ type powerup SQIID <return>

o+ when instructed, turn on power to the instrument

o+ answer y <return> to the question “Do you want windows?”

o+ type setup sqiid <return> . The system output will pause (order one minute) after it has issued one or more “running” statements and then resume

o+ answer y <return> to the question “Do you want to activate the array?” (if you failed to answer “y”, you can activate the detectors by typing activate <return> when you see the “%” prompt). [Note: SQIID has no button to push.]

o+ type puse parameterfile to restore the saved parameterfile, including the “eask” choices (type puse sqiid if you don’t remember what it was)

o+ use “ped” or “ask”, paying special attention to the “header directory”, “pixel directory”, “filename tem- plate”, “display”, and “picture index” values to verify that the images will be going where you want them

You should now be able to continue with your observing.

o+ “setup sqiid”, answering “y” to the question about detector activation

o+ “puse parameterfile” to restore the parameterfile you had been using (type “puse sqiid” if you don’t remember what it was)

o+ use “ped” or “ask”, paying special attention to the “pixeldir”, “headerdir”, filename, and nextpix values to verify that the images will be going where you want them

You should now be able to continue with your observing.

SUN COMPUTER RE-BOOT

If it becomes necessary to re-boot the Sun computer, a task which should be handled by Mountain Computer Support Staff, the WILDFIRE system should be safed first by typing:

exit <return>

in the WILDFIRE CONSOLE window.

Please consult with either the Mountain Computer Support Staff or your designated SQIID support person before re- booting the Sun computer. Indiscriminate re-booting of the Sun computer can have a deleterious impact on SQIID observa- tions.

To safely re-boot the Sun computer from its console press:

<L1> and <A> keys together, then type:

G 0

Then, after the disk sync is complete press:

<L1> and <A> keys together again, then type:

b

Tape drive hang-ups can usually be cleared during the day with minimal impact on SQIID operations.

After the Sun Computer has been re-booted, follow the WARM RESTART AFTER INSTRUMENT COMPUTER RE-BOOT procedure above.