

THE ISAAC NEWTON GROUP OF TELESCOPES

INSTRUMENT CHANGE CHECKLIST

INTEGRAL

with

WYFFOS & UDAS



Revision : 1.5

Description : Multi-fibre spectrograph

Location : WHT GHRIL

Storage : 4 aluminium crates kept
in the Instrument Store

Preparation

Team required : 2 (1 mechanical, 1 electronics)

Approximate Time : 2 to 4 hours

This work should be carried out at least a day before the change, but...

NOTE Until further notice

If the instrument to be removed from GHRIL is NAOMI, this should have been already done. This involves removing the entire NAOMI optical bench from the GHRIL enclosure and replacing it with the general purpose optical bench. *This operation is beyond the scope of this document.* It is presumed that this work has been completed and the general purpose optical bench is in GHRIL.

ACTION

TICK BOX

1. Move the 4 aluminium flight cases containing INTEGRAL to the dome.

2. If fitted, remove the de-rotator and counterbalance weight from the GHRIL Nasmyth rotator.

3. Pump the WYFFOS cryostat. This is used together with INTEGRAL.

4. Inform Site Services that a liquid nitrogen Dewar will be needed at GHRIL.

5. Check if the two electronics crates are located in the rack in the GHRIL control room . These being:

- INTEGRAL VME crate
- INTEGRAL Stepper motor and control crate

PREPARATION COMPLETE

Signature :

Date :

INSTRUMENT CHANGE PROCEDURE

INTEGRAL

Team required : 1 Electronics specialist
1 Mechanical specialist
1 Assistant

Nominal time : 4 to 6 hours

MOUNTING INTEGRAL IN THE GHRIL

- | | |
|--|--------------------------|
| 1. Shutdown the observing system and record in the WHT logbook that an INSTRUMENT CHANGE is in progress. | <input type="checkbox"/> |
| 2. Switch on the oil pumps and the main axis (ALT and AZ) servo-amp breakers. Move the telescope to AZ 221° and pointing to the zenith (ALT 90°). The correct azimuth position is also marked on the observing floor. Check this is so. | <input type="checkbox"/> |
| 3. Shutdown the TCS once the telescope is in position. | <input type="checkbox"/> |
| 4. In the Control Room, LOCK OFF the telescope using the padlocked switch on the engineering desk. | <input type="checkbox"/> |
| 5. At the dome floor level, open the AP (access park) gates and lower the floor panels to give full access to the GHRIL main doors. | <input type="checkbox"/> |
| 6. Remove all items (if any) from the <u>*optical bench</u> , but DO NOT TOUCH the micro-alignment telescope.

n.b. * The optical bench has been replaced by a wooden table top for the time being. This will be so until NAOMI is re-sited on the DS. Nasmyth platform in the future. | <input type="checkbox"/> |

7. Move the dome and position the following boxes opposite the GHRIL door:

- FIBRE MODULE
- CALIBRATION UNIT
- GUIDING UNIT
- ACQUISITION UNIT

8. Fit the cam on the GHRIL rotator at the 180° position.

IMPORTANT Don't forget to do this!

9. Inform the SOFTWARE SECTION to change the TCS software for the Nasmyth rotator to work with INTEGRAL.

10. Lift the FIBRE MODULE with its yellow support frame from the box and position it on the *optical bench. Remove the 4 x M5 screws which hold the top part of the frame.

11. Release the fibre bundle and position it so that you're able to align and fit the FIBRE MODULE to the Nasmyth rotator. Position the fibre module on the rotator with it set to 180°. This is clearly marked.

IMPORTANT Take great care when handling the fibres.

12. Remove the yellow support frame and restore it back to its box

13. Install the two fibre bundle supports on the MARKED positions on the optical bench and position the bundles in these supports.

NOTE : Make sure the brass bushes are **NOT** tight. They must be able to rotate freely.

- | | |
|---|--------------------------|
| <p>14. Mount the ACQUISITION UNIT using 4 x M6 bolts to the marked positions on the *optical bench.</p> | <input type="checkbox"/> |
| <p>15. On top of the Acquisition Unit, mount the GUIDING UNIT with 4 x M6 nuts and bolts. Make sure the unit is in the right position in relation to the fibre lengths.</p> | <input type="checkbox"/> |
| <p>16. On top of the Guiding Unit, mount the CALIBRATION UNIT with 4 x M6 nuts and bolts.</p> | <input type="checkbox"/> |
| <p>17. Remove the side panels from both the GUIDING and ACQUISITION Units</p> | <input type="checkbox"/> |
| <p>18. Install the ACQUISITION FIBRE bundle by removing the LENS BRACKET from the unit (4 x M6 screws) and screw the fibre bundle into the aluminium coupling. Now replace the bracket on the unit.
<i>n.b.</i> <u>There is NO NEED for focus adjustments.</u></p> | <input type="checkbox"/> |
| <p>19. Install the GUIDING FIBRES into the Guiding Unit.</p> <p>Release the 2 x M4 screws on both sides of the unit. The two fibres are clearly marked for positions. Line up the arrow on the fibre and slide it carefully into it's holder. Clamp up the 2 x M4 screws.</p> <p>Note: <u>There are 3 arrows to line up on both of the fibres.</u></p> | <input type="checkbox"/> |
| <p>20. Install the CALIBRATION FIBRE into it's aluminium holder and tighten up the M3 screw.</p> | <input type="checkbox"/> |

WYFFOS WORK

21. INSTALLATION OF SLIT MODULE

Remove the first blue cover on WYFFOS to gain access to the mount. Also remove the top-half of the end cover.

22. Move to the back of the WYFFOS enclosure and position the fibre bundles to be installed. **Note:** There is very little space so take care.

23. Remove the big mirror which sits in front of the slit module mount by releasing the 3 x M10 bolts. Lift the mirror off the kinematic mount to give room.

24. Release the 3 over-centre clamps which hold the AF2 slit module and carefully place it on the left hand side in the enclosure.

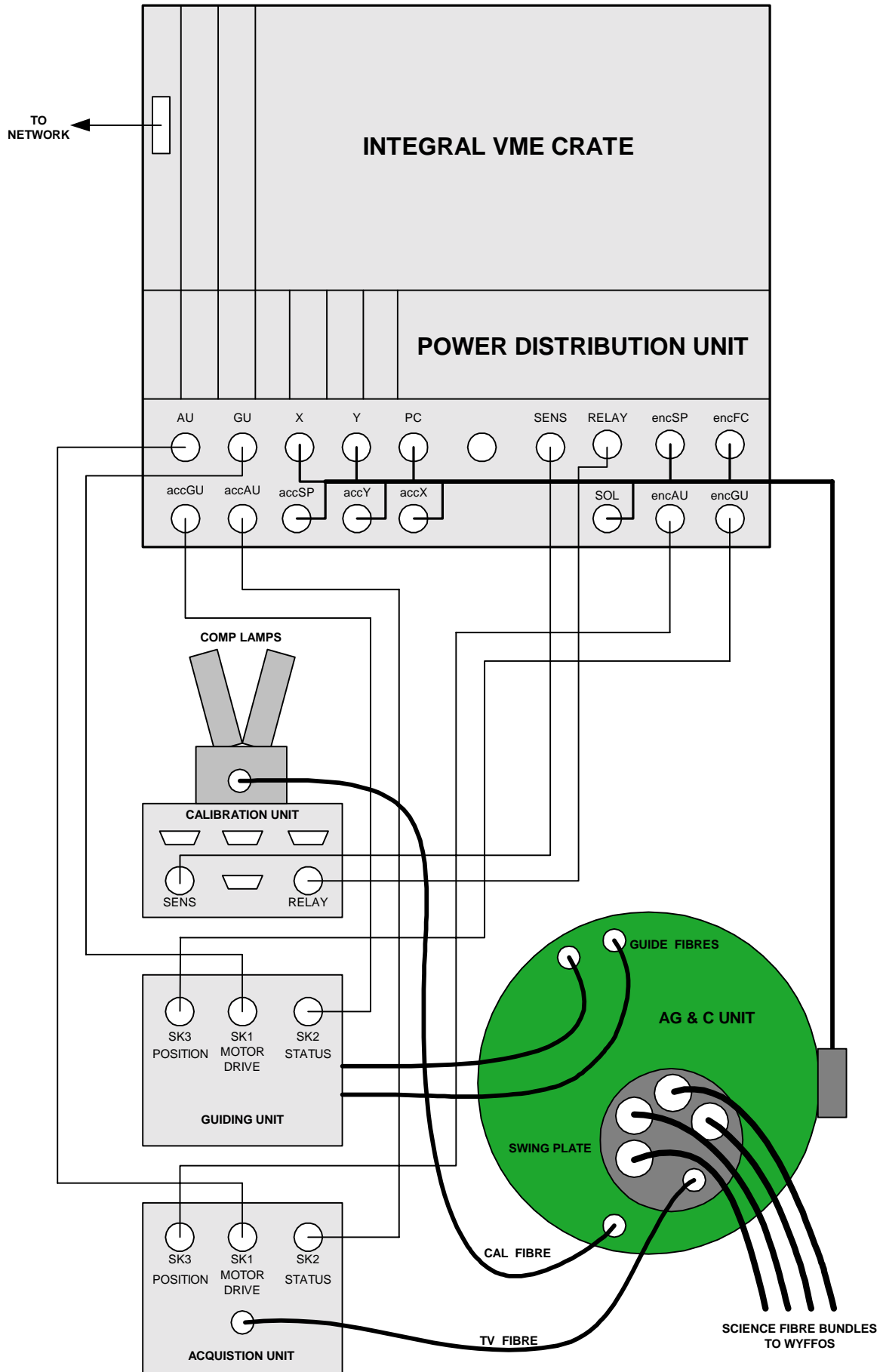
25. Now position the INTEGRAL slit module on the kinematic mount and re-lock the clamps. Re-position the big mirror and secure it with the 3 x M10 bolts.

26. Re-install the WYFFOS enclosure covers.

27. On the bottom side of the enclosure, fix the fibre bundles to the clamps.

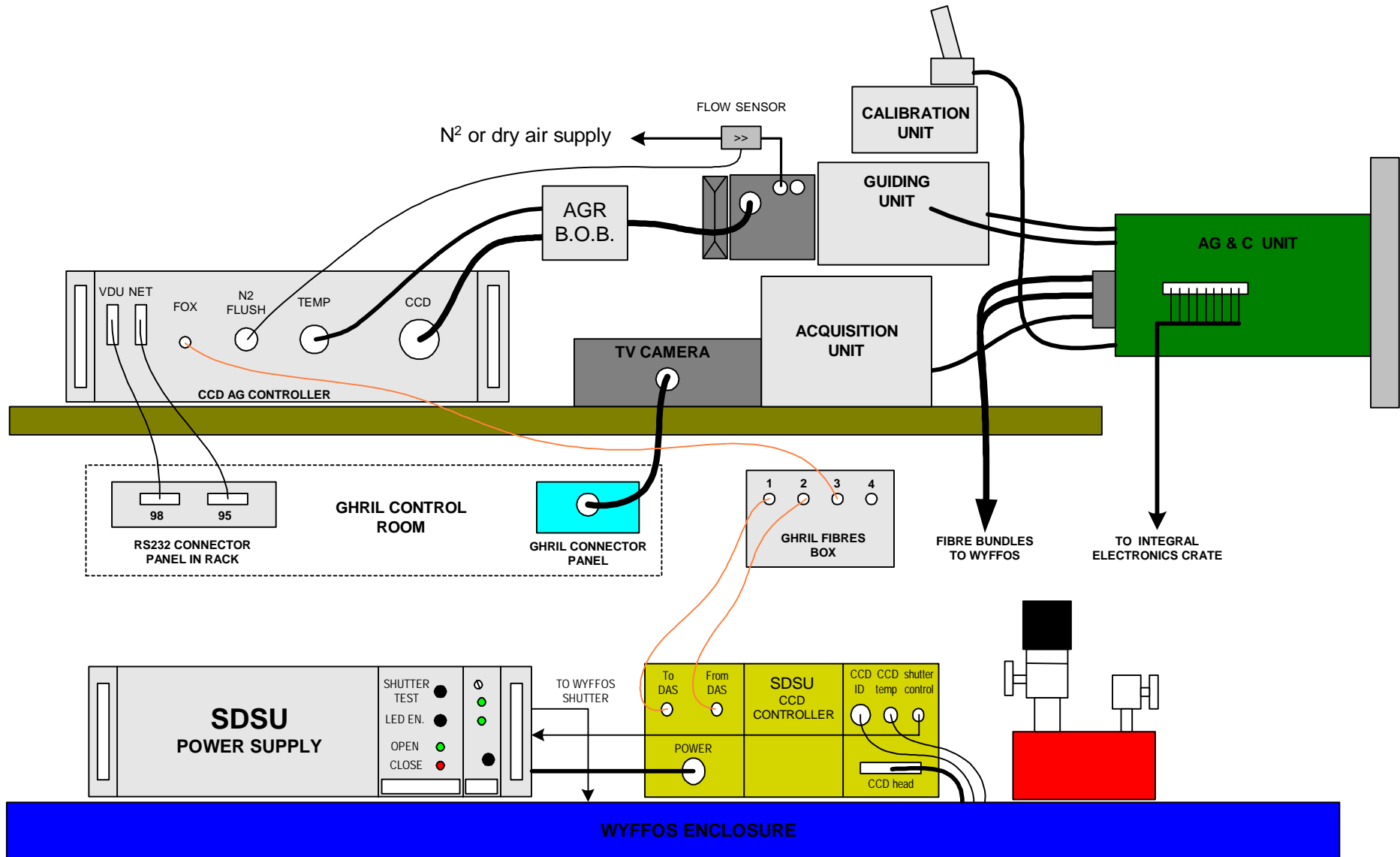
28. Install the TV camera and Autoguider and place the AG-CCDC on the optical bench using the brass spacers.

- Connect dry air flow to the autoguider head and the AG cables.
- Pass the TV camera cable through the light trap and plug it into connector plate on the wall in the GHRIL CONTROL ROOM. *See drawing on page 8*



INTEGRAL AUTOGUIDER AND WYFFOS CCD INTER-CONNECTIONS

ejm 19/02/01



29. Check if the TV-cable (247) at the top of the twister, coming from GHRIL is connected to one of the 3 cables going to the control room. (239, 240 or 245). 239 is normally used for the Cass TV. Use either 240 or 245 (whatever is one spare).

30. Pass the cables from INTEGRAL through the light trap into the GHRIL control room and make the connections. The connectors are clearly marked. *See drawing on page 7*

- Rotate the AG & C unit locally and check that the cables don't snag.

31. Connect the VDU and NETWORK cables from the AG-CCDC to the connector panel in the rack in the GHRIL control room and plug the AG-CCDC fibre cable to the fibre optics wall box (port 3) *See drawing on page 8*

32. Check that the TEK6 SDSU CCD controller with it's PSU is on top of the WYFFOS enclosure and the TO and FROM fibres are connected to the fibre optics wall box (ports 1 & 2)

33. Make sure that NETWORK link cables are connected from:

- The INTEGRAL VME crate via a transceiver
- WYFFOS
- The X-terminal in the rack.

To the bank of wall sockets behind the two 19 inch racks

34. Power up the calibration unit and autoguider controller then the electronics crates in the GHRIL control room. Switch on the SDSU PSU. Check that the shutter PSU (in the SDSU PSU crate) is also switched on.

35. Start the EPICS Engineering mimic on the X-Terminal in the GHRIL control room rack.
Telnet to : **orion.ing.iac.es**
User name : **whtmimic**
Password : **M!micry**
Type: **start_integral**
Then select **start** to bring up the menu box.

36. Test all the 5 mechanisms using the Engineering Mimic. This is self explanatory. The mechanisms are :

SP (swing plate), **Autoguided- X probe, Autoguided- Y probe, Autoguided filter-wheel , Acquisition wheel**

Test the three calibration lamps also :

White, CuNe, CuAr

nb. Close down the Engineering Mimic after testing.

37. Check the rotator limits by turning the rotator with the LOCAL CONTROL push buttons, moving from 180° to 360° then back to 0° **IMPORTANT** Make sure the rotator stops when the cam hits the limit switches and that there is FREE MOVEMENT with the fibre bundles and AG & C cables .

ACTIVITIES IN THE WHT CONTROL ROOM

38. Cables and fibre optic links (blue cabinets)

1. Check that the TV cable selected for GHRIL is connected at the back of the Westinghouse controller.
2. The RS232 link (NET) from the AG-CCDC in GHRIL is connected to the autoguided VME crate.
Note that the INTEGRAL autoguided application shares a VME serial port with PRIME. It may be necessary to remove the RS232 connector labelled PRIME and plug in the connector labelled GHRIL
3. From the Fibre Optic Distribution Tray (GHRIL fibres)
 - That an FO link is made between port 3 and a FOX card in the autoguided FOX crate.
 - The TO and FROM fibres from the computer *lacerta* (**DAS 5**) are connected to ports 1 and 2.

39. Autoguided software

The autoguided needs a special version of the VME software which is stored on a FLOPTICAL disc. Insert the disc in the drive and press RESET on the VME crate. Before the system starts booting, press Cntrl-C on the terminal to stop the process. Now type INSITE RELOAD to boot from the FLOPTICAL. When finished, type INTEGRAL to select the autoguided.

FIELD ROTATION AND FOCUS ADJUSTMENT

40. Start up the INTEGRAL Engineering Mimic using the commands as described in box 35.

- Click the **SP** button to bring up the swing plate/feed through connector window.
- Select 14 – 6 – acq - cal and click: move

This will put the Acquisition bundle (TV) into the calibrate position .

- Click the **WL** button to bring up the white lamp window.
- Select **ON** and click : move (To switch the lamp on)

Warning

The following procedure can cause irreversible damage to the TV camera. Be careful with the ambient light in the GHRIL enclosure as the is NOT interlocked with the dome lighting.

41. Switch on the Westinghouse TV controllers then switch on both the cameras on the control desk. UES is now the GHRIL camera. Turn up the gain VERY carefully watching the monitor. A rectangular illuminated field should appear on the screen. This field can be used to adjust the rotation and focus of the Acquisition Unit.

To do this, you need a second person in GHRIL with a radio or using the intercom.

- Remove the side panel of the acquisition unit from the WYFFOS side.
- Behind the panel, find the lens with it's holder.
- Undo the M8 bolt (13mm spanner) and slowly rotate the lens until the field is straight.
- Secure the bolt and put back the panel.
- The focus can be adjusted turning the metal knob at the front of the unit. Adjust until the corners of the field are as sharp as possible. When optimised, turn off the lamp and TV-camera.

Bringing up the Vax based Instrument Control System (ICL)

Note *It is better if the TCS is NOT running before the starting the ICL. The ICL will automatically bring up the TCS during start-up.*

42. ICL OBSERVING SYSTEM WITH INTEGRAL

- Logon to the Vax workstation lpvs1 as : observer
Once logged in, a DECterm will be displayed prompting what system is required. These being LPVG or LPVF.
- Check the white board for the ICL observing system currently in use. This is usually LPVG, but there are occasions it could be LPVF.
- From the DECterm, logon on to LPVG as: observer

When logged in :

- Hit return to : Have you read the news?
- When asked : Do you want to run the observing system (Y) Enter : y
- When the \$ prompt is displayed, type: ICL
- Hit return to : Observers initials and Patt reference
- When asked if you want to use the current setup respond NO, then select the option: WYFFOS using INTEGRAL.
- The ICL will continue to load the various D-tasks and bring up the mimic display.
- The ICL will also start the TCS. Check this happens on lpx15.
- Wait until the message : ICL start-ups have completed is displayed.
- When the prompt with the time stamp is displayed, (e.g. 14:15:30>) the ICL is ready.

43. TCS CONFIGURATION FOR INTEGRAL

When the TCS is running, you need to enter some commands to select INTEGRAL.

These being :

```
User> STATION GHRIL_ROT
User> INSTRUMENT INTEGRAL
User> AGSELECT INTEGRAL
```

Now check the software limits are set correctly:

```
User> SHOW LIMITS
```

This produces a list of software limits. The GHRIL rotator limits should be 3 and 356 degrees

WHT UltraDAS (WYFFOS)

Note

The new WHT observing system currently comprises of six computers. WYFFOS uses :

- DAS 5 lacerta PRIME, UES or GHRIL (SPARC Ultra 1)
- SYS taurus Central Intelligence (SPARC Ultra 10)

The system computer runs the terminal windows and displays, but does not at this stage of the development of the system, run the instruments. The ICS is part of the ADAM system, running on VAX computers.

More info can be found at <http://www.ing.iac.es/~docs/ins/das/ins-das-29/ins-das-29.html>

44. Starting up UltraDAS	
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Login to taurus as: whtobs

Several windows should then appear.

- The CIA (pink) window where commands are entered and :
- A DAS (orange) window for each SDSU controller

n.b .A blue *taurus* Xterm will be generated also, but this will be iconised.

Iconise the DAS windows that are not being used. In the case of WYFFOS this would be DAS, DAS 3 and DAS 4

In the DAS 5 window enter :

```
obssys
```

Select the WYFFOS option number. Then type :

```
startobssys
```

The DAS software will be loaded and the DAS> prompt returned when completed.

- In the CIA window, enter the same commands as above. The option number MUST be the same as entered for the DAS.

- During start-up, various windows will be generated. The important ones being:
 - Talker
 - Observing log
 - UDAS mimic
 - Who goes there (observer's info)

When the SYS> prompt is returned. The observing system is ready.

The UDAS mimic on *taurus* will contain information on which disc or disc partition the images are being stored. These currently being: *whtb*, *whtc* & *whtd*.

45. Take a test image with the TEK6 (WYFFOS)	
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- To take an image, enter at the SYS> prompt : `bias integral`
- Wait until the UDAS mimic indicates that the CCD has been READ OUT and is idling. Make sure the image gets written (with TCS header information) to the Observing Log.
- To display the image, login as *whtguest* on the WHT Data Reduction SPARC (*lupus*).
- Open the programs menu by clicking on the background and start `xgterm` and `ximtool`
- In the `xgterm`, start an IRAF session using the command: `cl`
- Within IRAF, change to the `/obsdata` directory where the images are being stored. Note, a new 'date' directory is generated at 12:00 hrs daily.

e.g. `cd /obsdata/whtb/20010208`

To display the image from TEK6, enter at the IRAF prompt:

```
display rxxxxxx[1] 1 fill+
```

Where `rxxxxxxx` = next sequential image number.

46. Examining the bias frame	
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- At the IRAF prompt, enter : `imexam`

Move the mouse into the area of the displayed frame and left click. Move the mouse around the image area, typing "m". This will produce statistics for a box containing 25 pixels centred on the mouse cursor.

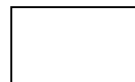
Information on the expected bias level can be found at :
http://vela.ing.iac.es/Engineering/detectors/ultra_tek6.htm

To exit imexam, leave the mouse cursor over the image area and type "q".

47. FINALLY :

Check out INTEGRAL/WYFFOS using the DE-Check list in the red book in the control room. The version on the WEB is always the most recent. If the paper copy is an older version, the latest version can be found at:

http://www.ing.iac.es/~eng/ops/wht/integral_checks.html



INSTRUMENT CHANGED COMPLETED

CHANGE COMPLETE

Signature :

Date :

HAND-OVER TO SUPPORT ASTRONOMER

SET-UP COMPLETE

Signature :

Date :