THE ISAAC NEWTON GROUP OF TELESCOPES

INSTRUMENT CHANGE CHECKLIST

ISIS

Revision : **1.1**

Description : WHT Cass ID Spectrograph

Location : WHT Cassegrain focus

Weight : 1500 Kg

Preparation

Team required : 2 (1 mechanical, 1 electronics)
Approximate Time : NA

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

IMPORTANT : Make sure that the detectors to be used are pumped and cooled down ready to be fitted the next day.

Tick each box when complete.	TICK BOX
1. The handling trolley for the instrument to be removed from the telescope must be lifted to the observing floor.	
2. ISIS should must be lifted up to the observing floor. The top of the handling frame can be removed so that the instrument is ready to be mounted.	
3. Any electronic equipment, cabling or cryostats not on the telescope should be taken to the observing floor.	
4. Any cryostats that are fitted to ISIS that are not in use elsewhere should be mounted and the micrometers set-up.	

PREPARATION COMPLETE

Signature : Date :

INSTRUMENT CHANGE PROCEDURE

WHT CASS ISIS SPECTROGRAPH

Team required : 2 Electronics specialists
2 Mechanical specialists
1 Weightlifter

Nominal time : 6 hours

Instrument Mounting

1. Make entry in log book : **DON'T MOVE THE TELESCOPE**	
2. **IMPORTANT** Position the telescope for change : Azimuth 300^o and Elevation 90^o	
3. Lock telescope off in control room.	
4. Turn the Cassegrain rotator to correct angle and line up the marks on ISIS and the A&G box	
5. Put telescope ties in on UES side	
6. Remove all connections to instrument to be removed.	
7. Move instrument handling trolley under instrument, align and attach.	
8. Unbolt and remove the instrument	

9. Check that the ISIS lid is open.	
10. Move ISIS into place and bolt on. *ONE* person only to check all bolts are tight.	
11. Lift down and store trolley.	
12. Balance telescope. *nb*. This should be done after cabling up and switching on ISIS and the CCD controllers. Pre-testing can then be carried out during balancing.	

Instrument Cabling

ISIS Connections

13. Connect the ISIS air supply.	
14. Connect the ISIS 4MS Network and Engineers' ports to an NIU port and the RS232 box (labelled ISIS)	
15. Connect the ISIS EPICS crate to the DECNET	
16. Connect and switch on the ISIS mains.	
17. Switch on the ISIS 4MS ASL unit EPICs crate 24V SMDM PSU	

ISIS CCD Mounting (Red and Blue arms)

n.b. For items 18 & 19 **DO NOT** use the high pressure air line.

18. Clean the CCD Cryostat window	
19. Clean the Camera lens	
20. Ensure correct filler tube is fitted. HALF LENGTH tubes are needed for cryostats mounted on ISIS	
21. Set the capstans A, B, C and the rotation for each cryostat as per the 'Capstan Settings Book' using the micrometers.	
22. Clamp the capstans in correct order *i.e.* A- hole B- slot C- flat. **TO PREVENT FORMING AN EARTH LOOP** Ensure the micrometers including the 'D' rotation micrometer are wound back and not touching the frame. Also check that the lever clamps have insulating material (or pads) fitted where they make contact with the capstan screws	
23. Set cryostat window flushing to 50 litres/hour.	

ISIS CCD Connections

24. <u>Connect **RED** arm CCD main signal cable</u> From cryostat preamp to Dutch CCDC (CCD 1)	
25. <u>Connect **RED** arm Shutter cable</u>. From Dutch CCDC (Shutter 1) to ISIS shutter control box (RED connector)	

26. Connect **RED** arm CCD Temperature cable. From cryostat to Dutch CCDC (Temp 1)	
27. Connect **RED** arm CCDC data fibre. From Dutch CCDC to fibre optic distribution box	
28. Connect **RED** arm Network and Engineer Cables. From Dutch CCDC to any NIU port and the RS232 box connector labelled (RED)	
29. Connect **BLUE** CCD main signal cable. From cryostat preamp to Dutch CCDC (CCD 1)	
30. Connect **BLUE** arm Shutter cable. From Dutch CCDC (Shutter 1) to ISIS shutter control box (BLUE connector)	
31. Connect **BLUE** arm CCD Temperature cable. From cryostat to Dutch CCDC (Temp 1)	
32. Connect **BLUE** arm CCDC data fibre. From Dutch CCDC to fibre optic distribution box	
33. Connect **BLUE** arm Network and Engineer Cables From Dutch CCDC to any NIU port and the RS232 box connector labelled (BLUE)	

ISIS post installation checks

ISIS Preliminary Checks

1. In the control room, select the DMS window on the SPARC (lpss3) and type **?NET**. Make sure an acknowledgement message is received from ISIS and the CASS A&G BOX. At the same time, check that the CCD network names allocated for the RED and BLUE arms are acknowledged also.

2. At the instrument engineering terminal switch box (right knob) select CASS INST and using the right hand VT220 terminal , type **.SLINKS**

This will test there is communication to each of the SMDM's and the encoder channels. Any faulty serial links will be listed. A faulty link to SMDM M can be ignored this is the Lid control which will never be implemented.

3. Still at the engineering terminal, type the commands **ILS** and **CONFIG** These both give useful information about the health of the instrument

ISIS CCD's Preliminary Checks

4. At the detector engineering terminal switch box (left knob) select the CCD channel used on the **RED** arm. (This info is on the CCD status magnet board)

5. Using the left hand VT 220 terminal. Type **SEE** to see the detector status. Check that the temperature is correct.

6. Type **UNJAM** followed by **OPEN** and **CLOSE**, this tests the shutter movement. Try it several times.

7. Repeat steps 4-6 for the **BLUE** arm CCD.

Final Checks through ICL

1. Before bringing up ICL, edit the detector configuration file for the correct detectors.

2. Update the CCD status magnet board

3. Bring up ICL, following the prompts.
This information is detailed in the WHT DE checklist

The following commands check the functionality of all ISIS mechanisms.

Red Grating

INRG
CENWAVE RED 4500
CENWAVE RED 6000

Red Collimator

NB This should only be done after a change and not during a run as the collimator will have been carefully setup.

INRCOLL
RCOLL 28000
RCOLL 1000

Red Fold

INRFOLD
RFOLD 1

Red Filter A

ISIS_INIT RED_FILTER_A
RFILTA 1
RFILTA 2
RFILTA 0

Red Filter B

ISIS_INIT RED_FILTER_B
RFILTB 1
RFILTB 2
RFILTB 0

Red Hartmann Shutters

RHART 1
RHART 2
RHART 3
RHART 0

Blue Grating

INBG
CENWAVE BLUE 6500
CENWAVE BLUE 4500

Blue Collimator

NB This should only be done after a change and not during a run as the collimator will have been carefully setup.

INBCOLL
BCOLL 28000
BCOLL 1000

Blue Fold

INBFOLD
BFOLD 2
BFOLD 1
BFOLD 0

Blue Filter A

ISIS_INIT BLUE_FILTER_A
BFILTA 1
BFILTA 2
BFILTA 0

Blue Filter B

ISIS_INIT BLUE_FILTER_B
BFILTB 1
BFILTB 2
BFILTB 0

Blue Hartmann Shutters

BHART 1
BHART 2
BHART 3
BHART 0

Slit unit carriage

INSLIT
MSLIT
LSLIT

Set Slit Width

SLIT 100
SLIT 5000
SLIT 1000

Dekker Slide

INDEK
DEKKER n (where n = 1 to 8)
DEKKER 0

Field Lens, Calcite & Polaroid Tray

INFCP
FCP POLAROID
FCP FIELD_LENS
FCP CALCITE
FCP CLEAR

Slit Door

SLIT_DOOR OPEN
SLIT_DOOR CLOSE

NB. The dekker should be at position 0 for access to the slit area.

Quarter Wave Plate

INQW
QW_POLAR MOVE IN
QW_POLAR ROTATE 0.5
QW_POLAR STOP ROTATE
QW_POLAR ANGLE 100
QW_POLAR ANGLE 3000
QW_POLAR MOVE OUT

Half Wave Plate

INHW
HW_POLAR MOVE IN
HW_POLAR ROTATE 0.5
HW_POLAR STOP ROTATE
HW_POLAR ANGLE 100
HW_POLAR ANGLE 3000
HW_POLAR MOVE OUT

Grating Doors and Grating Clamp checks

REDGRAT 35000 this moves the red grating square on to the door.
BLUEGRAT 35000 this moves the blue grating square on to the door.

GRATING_DOOR OPEN go out to ISIS and open the door.

Use the switches inside each grating compartment to check that each set of clamps release. Then ensure that the clamps are on before closing the door.

GRATING_DOOR CLOSE

Using the WHT Duty Engineering notes for reference…

Take an arc with each arm. If arc lines are obtained then it is time to hand over to the Support Astronomer to perform the final focusing and CCD alignment.

INSTRUMENT CHANGE COMPLETED

CHANGE COMPLETE	
Signature :	Date :

HAND-OVER TO SUPPORT ASTRONOMER

SET-UP COMPLETE	
Signature :	Date :