# Instrument Change Checklist

Dummy Weight removal & installing BLT

**Release** ~~Draft~~/Final
Date: 03/05/2008

Version 1.2

| | |
|---|---|
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| **Work Requested By:** | Don Abrams |
| **Client:** | Isaac Newton Group of Telescopes |
| **Document Number:** | OPS_BLT_IC |

# Document History

**Document Location**

This document is only valid on the day it was printed.
The document can be found at :
http://www.ing.iac.es/~eng/ops/wht/instruments/ops_blt_ic.pdf

**Revision History**

Date of this revision: 09/05/2007
N/A

| Version Number | Revision date | Previous revision date | Summary of Changes | Changes marked |
|---|---|---|---|---|
| 0.10 | 19/01/2007 | N/A | Document created | |
| 1.00 | 06/02/2007 | 19/01/2007 | General revision after instrument change 26/01/07; added BLT removal | |
| 1.10 | 09/05/2007 | 06/02/2007 | Revision of BLT removal procedure | |
| 1.20 | 03/05/2008 | 09/05/2007 | Added testing enclosure is light tight | |

**Approvals**

This document requires the following approvals.
Signed approval forms are filed in the project files.

| Name | Signature | Title | Date of Issue | Version |
|---|---|---|---|---|
| Servando Rodriguez | | | 04/05/08 | 1.2 |
| Michiel van der Hoeven | | | 04/05/08 | 1.2 |
| Juerg Rey | Juerg Rey | HoO | 04/05/08 | 1.2 |

**Distribution**

This document has been distributed to:

| Name | Title | Date of Issue | Version |
|---|---|---|---|
| Servando | Ho mechanical | 04/05/08 | 1.2 |
| Michiel | Deputy HoO | 04/05/08 | 1.2 |
| Juerg | HoO | 04/05/08 | 1.2 |

**List of Contents**

# PREPARATION

## Dummy Weight removal & installing BLT

**Team required**: 2 (1 change leader, 1 mechanical)
**Approximate time**: ½ hour

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

| Tick each box when complete. | TICK BOX |
|---|---|
| 1. Check sufficient staff is available & familiar with instrument change. | |
| 2. Check for clashes with other activities. | |
| 3. Check on tools, equipment, fixings and PPE. (Allen sockets 24mm, Torque wrench, Screw drivers, Slings, Eye bolts and Shackles) | |
| 4. Check BLT & trolley in TFS (keep air line attached). | |
| 5. All staff involved in this work must be familiar with risk assessment 'WHT PRIME Instrument Change'. | |

**PREPARATION COMPLETE**

Signature: Date:

# INSTRUMENT CHANGE PROCEDURE

Dummy Weight removal & installing BLT

**Team required:** 1 Banksman / Change leader
1 Crane operator
1 Electronics
1 Mechanical
Tibor or Olivier

*Nominal time:* ***2 hours***

## MOVE TELESCOPE TO AP3

| | |
|---|---|
| 1. Make an entry in the log book:<br>**INSTRUMENT CHANGE - Don't move the telescope** | |
| 2. Switch on the oil pumps and the main axis servo-amp breakers. Make sure the telescope is at the zenith. | |
| 3. Push the AP2 button on the balcony LOCAL control box.<br>***Note*** *You can speed up this operation by starting up the TCS, putting the telescope in* ***computer mode*** *and type:* ***park ap1*** *This will bring the telescope down to about 19$^o$ elevation. When the telescope has stopped moving, go back to* ***engineering mode*** *and continue the access parking procedure from the dome balcony. Bring the telescope down further by pushing the* ***AP2*** *(7$^o$ elevation) button.* | |
| 4. When the telescope is at AP2, unbolt and lower the two hinged floor panels to release the safety switches. Open the sliding gates to their full extent and remove the gate connecting bar. Push the AP3 button to bring the telescope tube horizontal to the dome balcony. Insert the additional protection bars to either side on the top end. | |
| 5. When the telescope is at AP3, pull down the TIE BARS on each side of the top end ring and clamp the tube to the balcony fixing points. | |
| 6. Lock off telescope power breakers & lock on oil support. | |
| 7. Make sure LASER is locked off. | |

## REMOVING DUMMY WEIGHT

| | |
|---|---|
| 8. Isolate the flip ring control box. A safety switch will detect in future presence of dummy weight and eliminate the need to disconnect the flip ring control box while the BLT is on. Ensure the flip ring control box is switched OFF. | |
| 9. Adjust trim weights as required. | |
| 10. Tension the crane to take the weight off the dummy weight. When this is satisfactory remove the bolts and dismount the dummy weight. | |
| 11. Inspection of cleanliness of threads. | |
| 12. Lift the dummy weight down and store in designated area. | |

# FITTING BLT


| | |
|---|---|
| 13. Using the 2.5 ton dome crane attach the yellow lifting frame to the BLT and tension the crane to take the weight off the BLT. | |
| 14. Remove the bolts fixing the BLT with the trolley and lift the BLT up. | |
| 15. At the top end position the BLT. When this is satisfactory, fit the 6 bolts (Allen head M10). | |
| 16. Before fixing the 6 bolts mentioned, tension the left screw for locking the BLT in rotation. Don't touch the right screw as this defines the reference point. Fix the 6 bolts afterwards. | |
| 17. Un-hook the lifting frame from the BLT and store with trolley. | |

| | |
|---|---|
| 18. Install transfer tube using the lifting platform. | |
| 19. Connect the following BLT cables:<br>- BLT stepper motor alpha 20 (alpha 21 is not connected yet)<br>- TV signal (BNC) - TV supply<br>- Earth - Air line | |
| 20. Remove big lens cover on the BLT. Only Tibor and Olivier are authorized to do this! | |
| 21. Install the BLT baffle and reconnect cover limit switches. | |
| 22. Fit a 300-500W lamp in the enclosure and close up. Switch off the dome lights and inspect no light is visible from outside. This inspection has to be done by the LSO or a person formally assigned to do this check thoroughly by the LSO. | |

## FITTING BLT COMPLETED

***CHANGE COMPLETE***

Signature: Date:

## *HAND-OVER TO T&I*

***SET-UP COMPLETE***

Signature: Date:

# PREPARATION

## BLT removal & installing Dummy Weight

**Team required**: 2 (1 change leader, 1 mechanical)
**Approximate time**: ½ hour

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

| Tick each box when complete. | TICK BOX |
|---|---|
| 1. Check sufficient staff is available & familiar with instrument change. | |
| 2. Check for clashes with other activities. | |
| 3. Check on tools, equipment, fixings and PPE. (Allen sockets 24mm, Torque wrench, Screw drivers, Slings, Eye bolts and Shackles) | |
| 4. Prepare BLT trolley in basement. | |
| 5. All staff involved in this work must be familiar with risk assessment 'WHT PRIME Instrument Change'. | |

**PREPARATION COMPLETE**

Signature: Date:

# INSTRUMENT CHANGE PROCEDURE

BLT removal & installing Dummy Weight

**Team required:** 1 Banksman / Change leader
1 Crane operator
1 Electronics
1 Mechanical

*Nominal time**:*** ***2 hours***

## MOVE TELESCOPE TO AP3

| | |
|---|---|
| 1. Make an entry in the log book:<br>**INSTRUMENT CHANGE - Don't move the telescope** | |
| 2. Switch on the oil pumps and the main axis servo-amp breakers. Make sure the telescope is at the zenith. | |
| 3. Push the AP2 button on the balcony LOCAL control box.<br>***Note*** *You can speed up this operation by starting up the TCS, putting the telescope in* ***computer mode*** *and type****:*** ***park ap1*** *This will bring the telescope down to about 19$^o$ elevation. When the telescope has stopped moving, go back to* ***engineering mode*** *and continue the access parking procedure from the dome balcony. Bring the telescope down further by pushing the* ***AP2*** *(7$^o$ elevation) button.* | |
| 4. When the telescope is at AP2, unbolt and lower the two hinged floor panels to release the safety switches. Open the sliding gates to their full extent and remove the gate connecting bar. Push the AP3 button to bring the telescope tube horizontal to the dome balcony. Insert the additional protection bars to either side on the top end. | |
| 5. When the telescope is at AP3, pull down the TIE BARS on each side of the top end ring and clamp the tube to the balcony fixing points. | |
| 6. Lock off telescope power breakers & lock on oil support. Place plate on engineering console 'don't switch off oilpumps'. | |
| 7. Make sure LASER is locked off. | |

## REMOVING BLT

| | |
|---|---|
| 8. Remove the BLT baffle. | |
| 9. Install big lens cover on the BLT. Only AUTHORISED staff! | |
| 10. Disconnect the following BLT cables and store separately:<br>- BLT stepper motor alpha 20 (alpha 21 is not connected yet)<br>- TV signal (BNC) - TV supply<br>- Earth - Air line | |
| 11. Remove transfer tube using the lifting platform. | |
| 12. Using the 2.5 ton dome crane attach the yellow lifting frame to the BLT. | |
| 13. Undo the left screw locking the BLT in rotation. Don't touch the right screw as this defines the reference point. Check left screw can't move or become loose.<br><br>Put cover on beamsplitter with target input to BLT. | |
| 14. Tension the crane to take the weight off the BLT. When this is satisfactory, remove the 6 bolts (Allen head M10) securing the BLT. | |
| 15. When the BLT is free, lower it into its handling trolley on the ground floor. | |
| 16. Un-hook the crane from the lifting frame and move the trolley to the TFS; attach the air line for flushing. | |
| 17. Lift the dummy weight up. | |

## FITTING THE DUMMY WEIGHTS

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|---|---|
| 18. Inspection of cleanliness of threads. Lubricate the M16 8.8 bolts with DryLub. Make sure bolts engage 10 turns. | |
| 19. Using the 2.5 ton dome crane attach the dummy weight. | |
| 20. Use torque wrench and apply 100Nm to each bolt. | |

## FLIP RING OPERATION (if top end change follows)

| | |
|---|---|
| 21. Undo the TIE BARS on each side of the top end ring and press the AP2 button on the balcony LOCAL control box. | |
| 22. When the telescope is at AP2, put back the gate connecting bar and close the sliding gates. Reseat the two hinged floor panels. Push the ZP button to bring the telescope back towards zenith until you have access to the flip ring control box. To stop the telescope where required press the AP1 button. | |
| 23. Connect up the flip ring box. A safety switch will detect in future presence of dummy weight and eliminate the need to disconnect the flip ring box while the BLT is on. | |
| 24. Push the ZP button to bring the telescope back to zenith. | |
| 25. **Only if you proceed with an instrument change!** Push the PRIME button on the FLIP RING control box. You need to keep this button pressed during the operation. Once the ring has flipped over, keep the button pushed to allow time for the ring clamps to re-engage (say a minute). There is NO visual indication implemented yet to indicate that the operation is completed. Continue with the instrument change following the according document.<br>**If the instrument change follows another day!**<br>Check balance of the telescope. | |

# REMOVING BLT COMPLETED

***CHANGE COMPLETE***

Signature: Date: