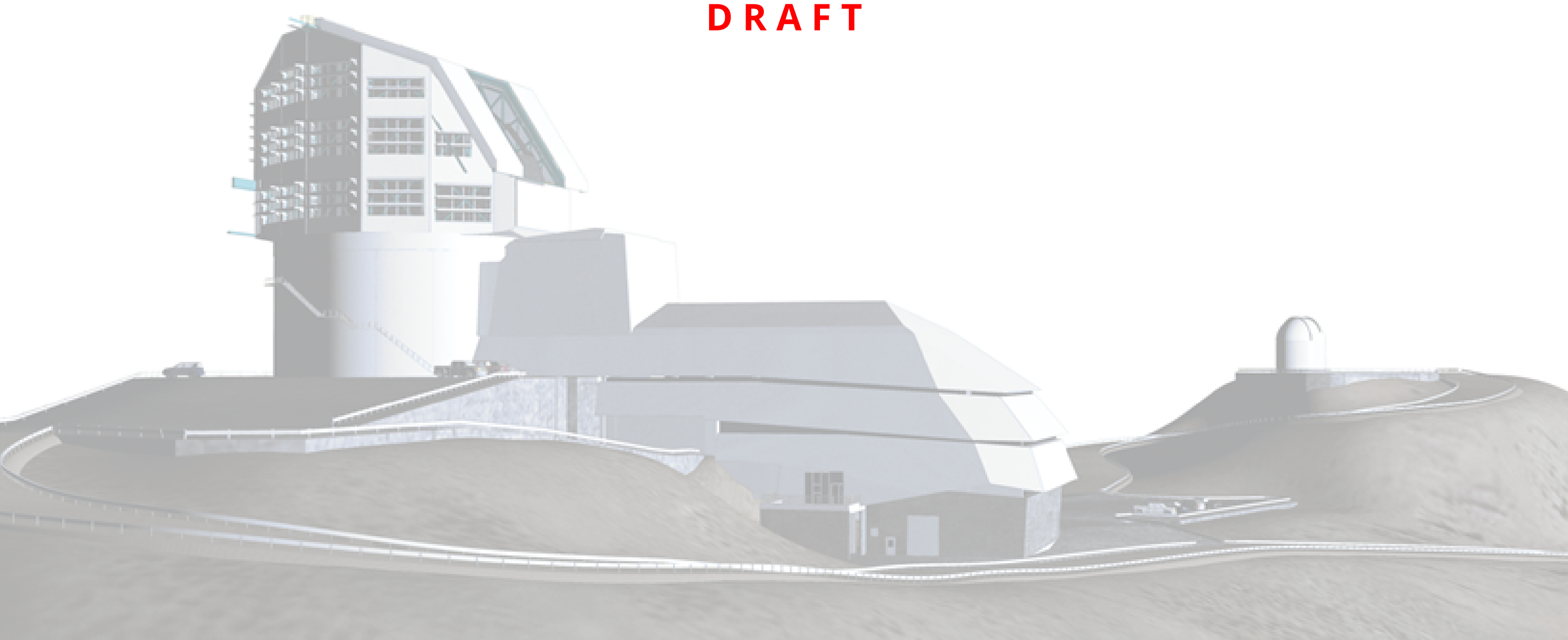
Vera C. Rubin Observatory
Software Test Report

LVV-P100: TMA Pointing and Tracking Verification Test Plan

Chuck Claver

SCTR-81

Latest Revision: 2023-06-29



Abstract

This is the test plan for **TMA Pointing and Tracking Verification**, an LSST milestone pertaining to the Data Management Subsystem.
This document is based on content automatically extracted from the Jira test database on 2023-06-29 . The most recent change to the document repository was on 2023-06-29.

Change Record

Version	Date	Description	Owner name
	2022-09-08	First draft	Chuck Claver

Document curator: Chuck Claver
Document source location: `https://github.com/lsst-dm/SCTR-81`
Version from source repository: b650046

Contents

LVV-P100: TMA Pointing and Tracking Verification Test Plan

1 Introduction

1.1 Objectives

The objective of this test plan is to verify the TMA pointing relative offset, repeatability, and accuracy. We will also verify the TMA tracking range in azimuth and elevation and the tracking drift. In addition to these verifications, we will validate the slew and settle time and the tracking jitter. These validations will be done after UTE has verified them using the TMA encoders. This test plan will utilize a StarTracker and DIMM test setup to perform the verification and validations.

1.2 System Overview

- The system consists of the StarTracker (two tubes) and the DIMM telescope mounted on the TMA.
- The StarTracker uses jumbo frames these need to be relayed from the Hardware through a dedicated network using the cable.
- The control of the TMA is done via CSC control.
- The Dome control is either controlled through the CSC or manually.

1.3 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P100 Jira Test Plan and related Test Cycles (LVV-C224 LVV-C228 LVV-C229 LVV-C230 LVV-C232 LVV-C233).

Section 1 provides an overview of the test campaign, the system under test (TMA), the applicable documentation, and explains how this document is organized. Section 2 provides additional information about the test plan, like for example the configuration used for this test or related documentation. Section 3 describes the necessary roles and lists the individuals assigned to them.

Section 4 provides a summary of the test results, including an overview in Table 2, an overall assessment statement and suggestions for possible improvements. Section **??** provides detailed results for each step in each test case.

The current status of test plan LVV-P100 in Jira is **Draft** .

1.4 References

[1] **[DMTN-140]**, Comoretto, G., 2021, *Documentation Automation for the Verification and Validation of Rubin Observatory Software*, DMTN-140, URL `https://dmtn-140.lsst.io/`, Vera C. Rubin Observatory Data Management Technical Note

[2] **[DMTN-178]**, Comoretto, G., 2021, *Docsteady Usecases for Rubin Observatory Constructions*, DMTN-178, URL `https://dmtn-178.lsst.io/`, Vera C. Rubin Observatory Data Management Technical Note

[3] **[LSE-160]**, Selvy, B., 2013, *Verification and Validation Process*, LSE-160, URL `https://ls.st/LSE-160`

2 Test Plan Details

2.1 Data Collection

Observing is not required for this test campaign.

2.2 Verification Environment

At the summit inside the main dome, using the final TMA hardware.

2.3 Entry Criteria

The soak test is executed, and the performance is understood.

1. LVV-T2748 (1.0) TMA Pointing and Tracking - Soak Test with Random Steps using MT-Mount

Hardware:

1. StarTracker available
2. TMA Interface build and available
3. SMR Reference installed
4. IT/Electrical connections established
5. Dome rotation possible

Software:

1. System Control – Minimum needed to run the test
    (a) TMA readiness/functionality
    (b) Rubin / Tekniker interfaces: Presentation of the TMA control interface
    (c) Pointing

   (d) Tracking
   (e) Dome rotation

2. Generic Camera CSC
   (a) Header services
   (b) LFA Readiness
   (c) Image access from LFA
   (d) Optional Goal: Larger software integration with the TCS

2.4 Exit Criteria

- All necessary data are taken.
- Data are analyzed and compared with FAT.
- All related tickets closed or in the case of FRACAS tickets progressed as far as possible.
- All test steps results are filled.
- The test plan report is generated.

2.5 Related Documentation

Docushare collection where additional relevant documentation can be found:

- Verification artifacts:
  - Star tracker data in the LFA of the EFD
  - Dimm data in the LFA of the EFD
  - Analysis products
    * Plot on the boresight estimation

  No DocuShare collection for this test plan is foreseen.

2.6 PMCS Activity

Primavera milestones related to the test campaign:

- None

3 Personnel

The personnel involved in the test campaign is shown in the following table.

	T. Plan LVV-P100 owner:	**Chuck Claver**	
	T. Cycle LVV-C224 owner:	**Chuck Claver**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T2707	Holger Drass	JIRAUSER20616	Telescope and Dome operator(s). For the Tailgate meeting, all personnel involved in observations with the main telescope during the night.
LVV-T2706	Roberto Tighe		Integration Specialist Telescope Operator Systems Engineer
LVV-T2705	Chuck Claver		Optics specialist Integration specialist
	T. Cycle LVV-C228 owner:	**Chuck Claver**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T2707	Chuck Claver		Telescope and Dome operator(s). For the Tailgate meeting, all personnel involved in observations with the main telescope during the night.
LVV-T2714	Chuck Claver	Holger Drass	Two observing specialists.
LVV-T2730	Chuck Claver	JIRAUSER20616	Oversight TMA and Dome operator Startracker Test Script executer Data Analyzer SE support
LVV-T2715	Chuck Claver		2x Observing Specialist
	T. Cycle LVV-C229 owner:	**Chuck Claver**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T2707	Chuck Claver	JIRAUSER20609	Telescope and Dome operator(s). For the Tailgate meeting, all personnel involved in observations with the main telescope during the night.
LVV-T2714	Chuck Claver		Two observing specialists.

LVV-T2731	Chuck Claver	Ioana Sotuela	Observing Specialist Systems Engineer
LVV-T2715	Chuck Claver		2x Observing Specialist
	T. Cycle LVV-C230 owner:	**Chuck Claver**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T2707	Chuck Claver		Telescope and Dome operator(s). For the Tailgate meeting, all personnel involved in observations with the main telescope during the night.
LVV-T2714	Chuck Claver		Two observing specialists.
LVV-T2732	Chuck Claver	Holger Drass	Observing Specialist Systems Engineer
LVV-T2715	Chuck Claver		2x Observing Specialist
	T. Cycle LVV-C232 owner:	**Chuck Claver**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T2738	Chuck Claver	Holger Drass	Data analyst Systems Engineer
LVV-T2703	Chuck Claver		Data analyst Systems Engineer
LVV-T2749	Holger Drass		Data analyst SE specialist
	T. Cycle LVV-C233 owner:	**Chuck Claver**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T2707	Chuck Claver		Telescope and Dome operator(s). For the Tailgate meeting, all personnel involved in observations with the main telescope during the night.
LVV-T2714	Chuck Claver		Two observing specialists.
LVV-T2740	Chuck Claver		Observing Specialist Systems Engineer
LVV-T2715	Chuck Claver		2x Observing Specialist

4 Test Campaign Overview

4.1 Summary

T. Plan LVV-P100:	**TMA Pointing and Tracking Verification**	Draft
T. Cycle LVV-C224:	**TMA Pointing and Tracking - Positional Calibration and Instrument Characterisation**	In Progress

Test Cases	Ver.
LVV-T2707	2
LVV-T2706	1
LVV-T2705	1

T. Cycle LVV-C228:	**TMA Pointing and Tracking - Part 1 and last Part - Pointing using StarTracker 50" - Pointing Repeatability 1" – StarTracker**	In Progress

Test Cases	Ver.
LVV-T2707	2
LVV-T2714	1
LVV-T2730	1
LVV-T2715	1

T. Cycle LVV-C229:	**TMA Pointing and Tracking - Part 2 - Reverse on the Sky Part 1 - 50"- StarTracker**	In Progress

Test Cases	Ver.
LVV-T2707	2
LVV-T2714	1
LVV-T2731	1
LVV-T2715	1

T. Cycle LVV-C230:	**TMA Pointing and Tracking - Part 4 - Offset 0.2" + Slew and Settle + TMA Tracking Jitter – Using the DIMM.**	In Progress

Test Cases	Ver.
LVV-T2707	2
LVV-T2714	1
LVV-T2732	1
LVV-T2715	1

T. Cycle LVV-C232:	**TMA Pointing and Tracking - Analysis - In Depth**	In Progress

Test Cases	Ver.

LVV-T2738	1
LVV-T2703	1
LVV-T2749	1

T. Cycle LVV-C233:	**TMA Pointing and Tracking - Part 3 - Tracking at Random Positions - 50" - StarTracker**	Not Executed
Test Cases	**Ver.**	
LVV-T2707	2	
LVV-T2714	1	
LVV-T2740	1	
LVV-T2715	1	

Table 2: Test Campaign Summary

4.2 Overall Assessment

Not yet available.

4.3 Recommended Improvements

5 Detailed Tests

5.1 Test Cycle LVV-C224

Open test cycle *TMA Pointing and Tracking - Positional Calibration and Instrument Characterisation* in Jira.

Test Cycle name: TMA Pointing and Tracking - Positional Calibration and Instrument Characterisation
Status: In Progress

Preparation for the requirements verification for the pointing and tracking using the Star Tracker and the DIMM on a dedicated mounting plate connector to the top end of the TMA. This test cycle includes the test cases to prepare the

- Metrology of the TMA
- Calibration of the StarTracker with respect to the TMA
- DIMM with respect to the StarTracker

5.1.1 Software Version/Baseline

Star Tracker software version:
Dimm software version:
CSC software version:
Analysis software repository:

5.1.2 Configuration

Not provided.

5.1.3 Test Cases in LVV-C224 Test Cycle

5.1.3.1 LVV-T2707 - Evening Summit Tailgate Meeting - TMA and Dome Testing Safety Assurance

Version **2**. Open *LVV-T2707* test case in Jira.

Ensure the safety of observation with the main telescope during nighttime operations.
Tailgate Meeting: Hold a tailgate for the upcoming task with personnel on the summit working during the night. Go over any relevant procedures, roles, and responsibilities.

Note: Version two is for tests that do not involve moving or opening the dome.

Preconditions:
All nonessential personnel has vacated the area.

Final comment:

Detailed steps :

Step 1	Description

Daytime info collection:

- Revise the last Summit Daylog about changes that might influence the work during the night.
- Confirm that all the workers in the TMA and Dome areas have already left. This is best performed during the walk-through at the end of the day.

Expected Result
Is the observatory ready to observe?

Step 2	Description

Night Shift Leader

Identify the Night Shift Leader (first and the second half of the night).

Note: This is the person responsible for deciding when

- the dome is going to be closed.
- to stop observing due to technical issues

Expected Result
One person is identified as the Night Shift Leader for each shift.

Step 3 Description
Tailgate Meeting:
Hold a tailgate for the upcoming task with personnel on the summit working during the night. Go over any relevant procedures, roles, and responsibilities.

1. If the Dome slit doors are not moving automatically, make sure that there are three persons with slit closer training available to close the slit manually.
2. Verify that there are enough persons with driver training available.
3. If the StarTracker is going to be used:
   (a) Clarify who is taking the off the caps in the evening.
   (b) Take a test image before opening the Dome.
   (c) Clarify who is installing the caps in the morning.
4. Discuss if surrounding observatories need to be informed. (Necessary when light is switched on in the dome during the night.)
5. If surrounding observatories need to be informed, clarify who is going to inform them and what information should be transmitted.
6. Check weather conditions and weather forecasts are within the specifications for observations.
7. Describe the tasks planned for the night.

Expected Result
All involved personnel understands their roles and responsibilities.

- If the Dome slit doors are not moving automatically, there are at least two persons with slit closer training available to close the slit manually.

- There are enough people with driver training available.
- If the StarTracker is used,
  - the caps are taken off in the evening by:
  - the test image is taken by:
  - the StarTracker caps are installed in the morning by:
- If surrounding observatories need to be informed,
  - they are informed by:
  - The following information will be transmitted:
- The weather conditions permit us to open the dome and do the planned testing.
- The tasks planned for the night are:

Step 4 Description

Tailgate Meeting – Part II:

If new personnel is participating in the nightly summit activities:

- Clarify that all personnel has PPE.
- Clarify that persons that need to go up into altitude have fall protection training.
- Confirm that we have enough personnel to open/close the dome shutter if required.
- Remind everybody that the emergency phone numbers are on the control room table.
- Do we have anyone else in the building? Confirm their location.

Expected Result

- All personnel has the required PPE.
- Persons that need to go up into altitude have the fall protection training
- Everybody acknowledges that the emergency phone numbers are on the control room table.

Step 5 Description

TMA and Dome contact

Person in charge of the TMA interlocks

Dome responsible

Expected Result

TMA and Dome contacts are known

Step 6	Description

Radio Communication

- Make sure one radio is switched to channel 1, and the volume is high
  - Paramedics, mountain assistants (in replacement of the paramedics), guards, and surrounding observatories are listening to this channel.
- Make sure one radio is switched to channel 3, and the volume is high
  - Rubin's internal coordination channel

Expected Result

The radios are switched on and on high volume.

Step 7	Description

Cars

- Make sure enough cars are available to go to the hotel.
- Make sure the keys for the cars are available.

Expected Result

Sufficient cars and their keys are available.

Step 8	Description

ComCam safety

Put ComCam in a safe state for moving. This includes:

1. CryoTels are under observation for vibrations (i.e. a microphone or webcam is observing them and operating correctly)
2. Turbo pumps are off

Expected Result

ComCam is in a safe state for TMA movement.

Step 9 Description

TMA moving space

Go to the dome and visually verify that there is unrestricted space for the TMA movement.

Expected Result

The space is clear and no objects will be struck when the TMA moves.

Step 10 Description

Alarm system check

Once available:

- Confirm that any audio and visual alarms are operating properly. (Need details on what, if any, alarms should be checked)
- Confirm that the safety systems for earthquakes and fire are working.

Expected Result

All alarms are functioning properly.

- Earthquake alert system is working:
- The fire system is working:

Step 11 Description

LOTO status:

If LOTO procedures are in use:
Set LOTO per (PROCEDURE, attached) at the following locations:

1. LOTO at the Dome
2. LOTO of the TMA Drives

Expected Result

The appropriate panels have been locked out or released.

Step 12 Description

Final walkthrough:

Perform a final walkthrough of the dome. Make sure all personnel is cleared out.

Expected Result

The dome is clear and safe for TMA movement.
The final walkthrough was performed by:

Step 13 Description

Dome closure:
If the Dome door GIS is available:
Exit the Dome, close the door (any details about what specific door)

Expected Result

The GIS system is active.

Step 14 Description

Dome clearance:

The Dome clearance is an EIE task, and they have to sign off.
If EIE is not available, perform these steps:

- Make sure that the dome crane is in the parking position. (Hook up)
- Position of the manlifts. Make sure the manlift supports are stored and are not on the rotation part of the dome.
- Walkthrough and make sure that there are no obstacles to move.

Example Code

https://confluence.lsstcorp.org/display/LTS/Dome+Remote+Software+Control+Procedure

Expected Result

The Dome is cleared for nightly operations.

Step 15 Description

PFlow lift

This is part of EIE's safety check.

If EIE is not available, perform this step:

- The Pflow lift must be stored before moving the dome.

Expected Result

The PFlow lift is stored properly

Step 16 Description

Shutter closer

If you have to close the shutter, the Dome must be under LOTO.

Note: There is no LOTO available at the moment. Use the procedure attached to this test case and the information from the following link:

https://confluence.lsstcorp.org/display/LTS/Dome+Remote+Software+Control+Procedure

Expected Result

The shutter was closed in a safe way.

Step 17 Description

GIS activation:

If the GIS for the Dome is available:

- activate the Dome GIS system.

Expected Result

If possible, the Dome GIS is activated.

Step 18 Description

Signoff

As a signoff, mark this step as passed

Expected Result
Safety Assurance is confirmed to be complete, and testing may proceed.

5.1.3.2 LVV-T2706 - StarTracker Positional Calibration

Version **1**. Open *LVV-T2706* test case in Jira.

This procedure provides a 2-point calibration between the optical axes of the TMA and StarTracker.
It assumes the TMA azimuth axis is co-aligned with the optical axis when the TMA is pointed at zenith as indicated by an elevation encoder value of 90 degrees.
For the pointing tests, the azimuth and elevations are the two axes that matter and should be measured.

This procedure has two parts:
1) Calibrate the StarTracker's line-of-sight to the reference axis as defined by the center of TMA azimuth rotation.
2) Establish the index reference of azimuth = 0 deg (180?) and altitude/latitude reference in elevation with the TMA pointing at the South Celestial Pole (SCP).

In each instance, the StarTracker will produce arcing star trails. The arcs will be fitted to find the center of rotation in StarTracker pixels (X, Y).
For part 1 of this procedure, this position will serve as the reference location for which the World Coordinate (WCS) system is derived using astrometry.net.
For part 2, the circle center represents the SCP. Iteratively the pointing of the TMA with offset such that SCP (X,Y) coincides with the Zenith reference (X,Y) determined in Part 1.
The encoder values here are noted, and physical markings are placed on the TMA (position TBD).

Notes:

- This uses the Laser Tracker Metrology.
- Flexure check of the Star Tracker's mechanical support with respect to TMA flexure vs. Elevation Angle...??
  - Determine lat-lon of azimuth track - e.g. rotation centre.
- There will be an offset between the optical axis of the StarTracker with the TMA optical axis.
- The internal "optical" axis, as defined by the littering the M1M3 SMRs (see previous calibration procedure), will be calibrated to the azimuth-elevation cordite references as part of the final construction of the pointing model when the optics are installed in the presence of ComCam.

Preconditions:
StarTracker is installed on the TMA.

Final comment:

Detailed steps :

Step 1	Description

5.2 Part 1: TMA Line-of-Site Calibration:

Expected Result

Step 2	Description

TMA pointing:
Point the TMA to zenith - elevation = 90.000000 degrees
Verify zenith orientation with a precision inclinometer.

Expected Result

The TMA points into the Zenith.
The inclinometer shows 90 deg.

Step 3 Description

StarTracker plate vs. TMA calibration:

Determine the TEA plane and the StarTracker plate to determine the orientation with respect to each other using the laser tracker.

- Measure StarTracker and M1M3 SMR references.

Expected Result

List fo StarTracker and M1M3 SMR positions.

Step 4 Description

Analyze the laser tracker data:

- M1M3: Fit a circle, determine the centered vector normal
- StarTracker: Fit a plane, determine the centered vector normal
- Calculate 3-space angles between M1M3 and StarTracker vector normal references
- Calculate the difference between reference vector normals at zenith and those determined in the Initial Metrology Procedure

Expected Result

The angles between the vectors normals are known.

Step 5 Description

TMA Zenith rotation

With TMA pointed at the zenith

- Command the TMA to rotate about the Azimuth axis only

- While the TMA is in motion, take a series of exposures (EXPTIME TBD) with the StarTracker (both optical systems)

Expected Result
The StarTracker images show circular arcs.

Step 6 Description
TMA bore-sight determination

- Stack/combine individual images to generate an image for analysis that has at least 180 degrees of arc to it.
- Analyze the combined StarTracker to determine the pixel (X, Y) of the circle center.
  - Chuck has a simple Python script using the Hough transform that does this. It is computationally intensive but works. Other methods are welcome.
- Note the coordinates of the cycle center in the StarTracker arc-trail image. This will be considered at the bore-sight of the TMA.
- Depending on the confidence level of the vector normal references, an angular correction can be applied to the circle center to transfer the reference to the M1M3 vector normal.
- The reference pixel (X,Y) will subsequently be used with astrometry.net as the WCS reference when estimating the Ra-Dec of the StarTracker images during the pointing verification tests.

Expected Result
Combined images with a least 180 deg arcs.
Reference (X,Y)-pixel value for astrometry.net is known

Step 7 Description

5.3 Part 2: Calibration of Elevation Dependence

Expected Result

Step 8	Description

Telescope pointing

Point the TMA to the South Celestial Pole (SCP)

Expected Result

The TMA points to the SCP.

Step 9	Description

Measure StarTracker and M1M3 SMR references

This repeats the previous measurement at a different inclination and considers therefore the TMA's flexure due to gravity.

- M1M3: Fit a circle, determine the vector normal
- StarTracker: Fit a plane, determine the vector normal
- Calculate 3-space angles between M1M3 and StarTracker references
- Calculate the difference between reference vector normals at the zenith, and this determined in the Initial Metrology Procedure

Expected Result

Plots showing the changes of SMR positions depending on elevation.

Step 10	Description

Taking StarTracker images - TMA pointing to the SCP

- Keep the TMA stationary - e.g. no tracking
- Obtain a series (e.g. 100 or more) of back-to-back StarTracker images
- 10-sec exposures – stars not saturated.

Expected Result

Images showing arcs are available.

Step 11	Description

SCP StarTracker Image analysis

- Run the StarTracker Images through any preprocessing - e.g. ISR (Image Signature Removal)
- Run the processed StarTracker images through astrometry.net to obtain WCS solutions centered on the reference determined at the zenith
- Calculate the mean, stdev, and time series in Ra-Dec for all solutions
- Calculate the mean, stdev, and time series in Az-El for all solutions
- Calculate the offset between the reference Ra-Dec and the South Celestial Pole - e.g., Az = 180.000000, El = Observatory Latitude
  We need the precise geophysical (Lat-Lon) coordinates of the azimuth track center. Do we have these values in our metrology?
- Compare the offsets from the SMR references with those from the on-sky measurements.
- Develop a simple Sin(el), Cos(el) model for TMA+StarTracker flexure
  This model will be applied to the on-sky-pointing verification test measurements.
- Determine the actual resolution of the long and short focal length StarTracker. Astronmetry net will provide the plate scale

Expected Result

Actual resolution of the long and short focal length StarTracker.

Step 12 Description

Ra-Dec characterization

- Calculate the mean, stdev, and time series in Ra-Dec for all solutions
- Calculate the offset between the reference Ra-Dec and the South Celestial Pole - e.g., Az = 180.000000, El = Observatory Latitude
  We need the precise geophysical (Lat-Lon) coordinates of the azimuth track center.
- Do we have these values in our metrology?

Expected Result

- Plots showing the mean and stdev for the observed Ra-Dec positions.
- Values for the difference between the South Celestial Pole and the AZ=180 and El= Obs. Latitude

Step 13 Description

Az-El characterization

- Calculate the mean, stdev, and time series in Az-El for all solutions

Expected Result
Plots for the mean, stdev and time series in Az-EL coordinates.

Step 14 Description
Laser Tracker vs. on-sky measurement comparison

- Compare the offsets from the SMR references with those from the on-sky measurements.

Expected Result
Plot showing the difference between Laser Tracker and on-sky measurements.

Step 15 Description
TMA + StarTracker flexure model
This model will be applied to the on-sky-pointing verification test measurements.

- Develop a simple Sin(el), Cos(el) model for TMA+StarTracker flexure

Expected Result
The equation describing the flexure of the TMA.
Plot the flexure model.

5.3.0.1 LVV-T2705 - DIMM Calibration with respect to the StarTracker

Version **1**. Open *LVV-T2705* test case in Jira.

Provide a 2-point calibration between the optical axes of the TMA and StarTracker.
It assumes the TMA azimuth axis is co-aligned with the optical axis when the TMA is pointed at the zenith, as indicated by an elevation encoder value of 90 degrees.
For the pointing tests, the azimuth and elevations are the two axes that matter and should be measured. The internal "optical" axis, as defined by the littering of the M1M3 SMRs (see

previous calibration procedure), will be calibrated to the azimuth-elevation cordite references as part of the final construction of the pointing model when the optics are installed in the presence of ComCam (Note a similar but extended procedure can/will be used with ComCam to re-verify the TMA pointing performance.
Notes:

- Following interaction with Pelayo, it has been realized TMA Chile Metrology Report referenced two coordinate systems. Pages 1-4 are in the external TMA azimuth-elevation coordinates, whereas from page 5 on are in the internal TMA coordinates.
- All indications are that there is good alignment between the Zenith pointing vector defined by the TMA azimuth track and the optical axis defined by the pointing vector from the M1M3 SMR fit.
- There is a substantial body of metrology that is either missing, in places unknown but accessible, or inaccessible. As we enter more integrated verification must be rectified.

Associate the center of the DIMM center to the Star tracker.

Preconditions:
The StarTracker and DIMM must be working.
The CSC for TMA and Dome must be working.

Final comment:

Detailed steps :

Step 1	Description

Make the reference between the TMA interface plane to the plane where the StarTracker is mounted.

Where the U-shaped bars are mounted, at the vertex, the center, and at one more position, SMRs should be mounted.

Expected Result
Show the normal vector is intersecting the optical axis
What is the angular of the StarTracker plane and the optical axis

Step 2 Description

Repeat the measurement at Zenith and Horizon.

Expected Result

A slight difference due to the gravitations bending of the TMA.

Step 3 Description

ComCam – StarTracker – Interface plane relation

This is a sanity check and will help later to associate ComCam images with the TMA orientation.

- Use the ComCam SMR and redo the measurements to establish the plane for ComCam.
- Compare normal vectors for the Star Tracker plane, the Interface Plane, and the ComCam Plane.

Expected Result

Set of values showing the differences in the vectors for ComCam and the StarTracker

Step 4 Description

Take images with the DIMM and the StarTracker at the same time.

Expected Result

Both images

- appear on Rubin TV
- are stored in the LFA
- a link stored in the EFD
- the link can be accessed through Chronograph.

Step 5 Description

Pointing outside of the dome

To determine the offset between the StarTracker and the DIMM

- Point the TMA at the weather tower/ DIMM tower.
- Connect the Laser Tracker via a CSC during the testing.

- This needs Dave and IT to get the Laser Tracker into the Network and the EFD.

Expected Result
Images with all three instruments are available.

Step 6 Description
Instruments center difference in Pixel

Find the center of rotation in the DIMM images.
Calculate the difference in Pixel in Az and El of both instruments.

Expected Result
The number of pixels in X and Y between the center of the StarTracker and the center of the DIMM are known.

Step 7 Description
Determine the dome position with respect to the StarTracker's FoV.
This ensures that we have enough tracking distance without being obscured by the dome.

Expected Result
The dome position is known and it is confirmed that there is enough time to track.

5.4 Test Cycle LVV-C228

Open test cycle *TMA Pointing and Tracking - Part 1 and last Part - Pointing using StarTracker 50" - Pointing Repeatability 1" – StarTracker* in Jira.

Test Cycle name: TMA Pointing and Tracking - Part 1 and last Part - Pointing using StarTracker 50" - Pointing Repeatability 1" – StarTracker
Status: In Progress

Requirements verification for the pointing and tracking using the Star Tracker and the DIMM on a dedicated mounting plate connector to the top end of the TMA.

Short-focal StarTracker. 7” per pixel resolution. Precision is about 1”.
Long-focal StarTracker is even better. 375 mm objective. 3.1” arc pixel resolution.

5.4.1 Software Version/Baseline

Star Tracker software version:
Dimm software version:
CSC software version:
Analysis software repository:

5.4.2 Configuration

Not provided.

5.4.3 Test Cases in LVV-C228 Test Cycle

5.4.3.1 LVV-T2707 - Evening Summit Tailgate Meeting - TMA and Dome Testing Safety Assurance

Version **2**. Open *LVV-T2707* test case in Jira.

Ensure the safety of observation with the main telescope during nighttime operations.
Tailgate Meeting: Hold a tailgate for the upcoming task with personnel on the summit working during the night. Go over any relevant procedures, roles, and responsibilities.

Note: Version two is for tests that do not involve moving or opening the dome.

Preconditions:
All nonessential personnel has vacated the area.

Final comment:

Detailed steps :

Step 1	Description

Daytime info collection:

- Revise the last Summit Daylog about changes that might influence the work during the night
- Revise at 16.00 CLT to have time for questions.

Expected Result
Is the observatory ready to observe?

Step 2	Description

Night Shift Leader

Identify the night shift leader (first and second half of the night).

Note: This is the person responsible for deciding when

- the dome is going to be closed.
- to stop observing due to technical issues

Expected Result
One person is identified as the night shift leader.

Step 3	Description

Tailgate Meeting:
Hold a tailgate for the upcoming task with personnel on the summit working during the night. Go over any relevant procedures, roles, and responsibilities.

1. If the Dome slit doors are not moving automatically, make sure that there are three persons with slit closer training available to close the slit manually.

2. Verify that there are enough persons with driver training available.
3. If the StarTracker is used, clarify who is taking the off the caps in the evening.
4. If the StarTracker is used, clarify who is installing the caps in the morning.
5. Discuss if surrounding observatories need to be informed.
6. If surrounding observatories need to be informed, clarify who is going to inform them and what information should be transmitted.
7. Check weather conditions and weather forecasts are within the specifications for observations.
8. Describe the tasks planned for the night.

Expected Result

All involved personnel understands their roles and responsibilities.

- If the Dome slit doors are not moving automatically, there are three persons with slit closer training available to close the slit manually.
- There are enough people with driver training available.
- If the StarTracker is used, the caps are taken off in the evening by:
- If the StarTracker is used, the StarTracker caps are installed in the morning by:
- Discuss if surrounding observatories need to be informed.
- If surrounding observatories need to be informed,
  - they are informed by:
  - The following information will be transmitted:
- The weather conditions permit us to open the dome and do the planned testing.
- The tasks planned for the night are:

Step 4 Description

Tailgate Meeting – Part II:

If new personal is participating in the nightly summit activities:

- Clarify that all personnel has the PPE
- Clarify that persons that need to go up into altitude have the fall protection training
- Remind everybody that the emergency phone numbers are on the control room table.

Expected Result

- All personnel has the required PPE.
- Persons that need to go up into altitude have the fall protection training
- Everybody acknowledges that the emergency phone numbers are on the control room table.

Step 5 Description

TMA and Dome contact

Person in charge of the TMA interlocks

Dome responsible

Expected Result

TMA and Dome contacts are known

Step 6 Description

Radio communication

- Make sure one radio is switched to channel 1 and the volume is high
  - Paramedics, mountain assistants (in replacement of the paramedics), guards, and surrounding observatories are listening to this channel.
- Make sure one radio is switched to channel 3, and the volume is high
  - Rubin's internal coordination channel

Expected Result

The radios are switched on and on high volume.

Step 7 Description

Cars

- Make sure enough cars are available to go to the hotel.
- Make sure the keys for the cars are available.

Expected Result

Sufficient cars and their keys are available.

Step 8 Description

ComCam safety

Put ComCam in a safe state for moving. This includes:

1. CryoTels are under observation for vibrations (i.e. a microphone or webcam is observing them and operating correctly)
2. Turbo pumps are off

Expected Result
ComCam is in a safe state for TMA movement.

Step 9 Description
TMA moving space

Go to the dome and visually verify that there is unrestricted space for the TMA movement.

Expected Result
The space is clear and no objects will be struck when the TMA moves.

Step 10 Description
Alarm system check
Once available:

- Confirm that any audio and visual alarms are operating properly. (Need details on what, if any, alarms should be checked)
- Confirm that the safety systems for earthquakes and fire are working.

Expected Result
All alarms are functioning properly.

- Earthquake alert system is working:
- The fire system is working:

Step 11 Description

LOTO status:

If LOTO procedures are in use:
Set LOTO per (PROCEDURE, attached) at the following locations:

1. LOTO at the Dome
2. LOTO of the TMA Drives

Expected Result
The appropriate panels have been locked out or released.

Step 12 Description

Final walkthrough:

Perform a final walkthrough of the dome. Make sure all personnel is cleared out.

Expected Result
The dome is clear and safe for TMA movement.
The final walkthrough was performed by:

Step 13 Description

Dome closure:
If the Dome door GIS is available:
Exit the Dome, close the door (any details about what specific door)

Expected Result
The GIS system is active.

Step 14 Description

Dome clearance:

The Dome clearance is an EIE task, and they have to sign off.
If EIE is not available, perform these steps:

- Make sure that the dome crane is in the parking position. (Hook up)
- Position of the manlifts. Make sure the manlift supports are stored and are not on the rotation part of the dome.
- Walkthrough and make sure that there are no obstacles to move.

Example Code
https://confluence.lsstcorp.org/display/LTS/Dome+Remote+Software+Control+Procedure

Expected Result
The Dome is cleared for nightly operations.

Step 15 Description
PFlow lift
This is part of EIE's safety check.
If EIE is not available, perform this step:

- The Pflow lift must be stored before moving the dome.

Expected Result
The PFlow lift is stored properly

Step 16 Description
Shutter closer
If you have to close the shutter, the Dome must be under LOTO.
Note: There is no LOTO available at the moment. Use the procedure attached to this test case and the information from the following link:
https://confluence.lsstcorp.org/display/LTS/Dome+Remote+Software+Control+Procedure

Expected Result
The shutter was closed in a safe way.

Step 17 Description
GIS activation:

If the GIS for the Dome is available:

- activate the Dome GIS system.

Expected Result
If possible, the Dome GIS is activated.

Step 18	Description

Signoff
As a signoff, mark this step as passed

Expected Result
Safety Assurance is confirmed to be complete, and testing may proceed.

5.4.3.2 LVV-T2714 - Configure Observatory Environment for Nighttime Operations

Version **1**. Open *LVV-T2714* test case in Jira.

At the beginning of the night, prepare the observatory for nightly operations.

Preconditions:
Dome and the TMA, or at least the TMA must available for observations.

Final comment:
Done as part of the tailgate meeting and daily routines of the observers. See the night log for details.

Detailed steps :

Step 1	Description

Telescope preparation:

- Remove the caps on top of the StarTracker telescopes and the DIMM.

- Check the instrument's health status by taking a test image.

Expected Result
The caps are removed.
The test image is taken and stored correspondingly.

Step 2 Description
Calibration images:
Not needed at the moment, to be included if data analysis reveals the need.

- Take 10 "darks" with the StarTracker and the DIMM instruments. Use the same exposure time as for the images.
- Take 10 "sky flats" with the StarTracker and the DIMM instruments.

Expected Result
The Darks and flats are stored in the expected location.

Step 3 Description
Auxillary systems nighttime preparations:

- Switch off the UMA in the afternoon.

Expected Result
The UMA is switched off.

Step 4 Description
Night logging page:
Start the night log similar to the AuxTel night log:

https://confluence.lsstcorp.org/display/LSSTCOM/Night+Logs

Expected Result
Page created with template information.

Step 5 Description
TMA preparation

- Check the Oil Supply System (OSS) on the EUI
- Follow the attached manual to startup the TMA.

Expected Result
The OSS is operational:

Step 6 Description
CSC activation:

Use L.O.V.E to bring the CSC to the enabled state.

Expected Result
All needed CSCs are in the enabled state.

5.4.3.3 LVV-T2730 - StarTracker Pointing and Tracking Test - Forward Azimuth Pattern

Version **1**. Open *LVV-T2730* test case in Jira.

Collect data with the StarTracker following the azimuth pattern -270, -180, -90, 0, 90, 180, 270 deg. Nominal at four elevation angles 15, 45, 75, 85 deg. Minimum at the three angles: 15, 45, 85 deg.

This test

- is foreseen the first of four tests
- takes about one-half summer night in the full version.

The analysis is done with the test case: LVV-T2738

Note: Tracking does not start at elevations higher than 85.0 deg. Same for Az, we can not go up to 270 deg. We had to use 250 deg.

Preconditions:
SITCOM-704 First Pointing Model Generation - Data Acquisition Preparation must be completed

Track for 10 min without the dome following.

Final comment:
Dome position is not aligned with TMA. CSC shows the different value.

Detailed steps :

Step 1	Description

Point the Dome and the TMA

- Command the Dome to Pointing 1 to -270deg
- Command the TMA to Pointing 1 at Az= -270 deg, El= 15 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 2	Description

Wait for the Dome to reach the commanded position.

Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 3 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -270 deg, El= 15 deg.

Expected Result

TMA reaches the commanded position.

Step 4 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 5 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..

Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 6 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 7 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 8 Description
Point the Dome and the TMA

- Command the Dome to Pointing 2 to -270deg
- Command the TMA to Pointing 2 at Az= -270 deg, El= 45 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 9 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 10 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -270 deg, El= 45 deg.

Expected Result

TMA reaches the commanded position.

Step 11 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 12 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 13 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 14 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 15 Description
Point the Dome and the TMA

- Command the Dome to Pointing 4 to -270deg
- Command the TMA to Pointing 4 at Az= -270 deg, El= 85.0 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 16 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 17 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -270 deg, El= 85.0 deg.

Expected Result

TMA reaches the commanded position.

Step 18 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 19 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 20 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 21 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 22 Description
Point the Dome and the TMA

- Command the Dome to Pointing 5 to -180deg
- Command the TMA to Pointing 5 at Az= -180 deg, El= 85.0 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 23 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 24 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -180 deg, El= 85.0 deg.

Expected Result

TMA reaches the commanded position.

Step 25 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 26 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 27 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 28 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 29 Description
Point the Dome and the TMA

- Command the Dome to Pointing 7 to -180deg
- Command the TMA to Pointing 7 at Az= -180 deg, El= 45 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 30 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 31 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -180 deg, El= 45 deg.

Expected Result

TMA reaches the commanded position.

Step 32 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 33 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 34 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 35 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 36 Description
Point the Dome and the TMA

- Command the Dome to Pointing 8 to -180deg
- Command the TMA to Pointing 8 at Az= -180 deg, El= 15 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 37 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 38 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -180 deg, El= 15 deg.

Expected Result

TMA reaches the commanded position.

Step 39 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 40 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 41 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 42 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 43 Description
Point the Dome and the TMA

- Command the Dome to Pointing 9 to -90deg
- Command the TMA to Pointing 9 at Az= -90 deg, El= 15 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 44 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 45 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -90 deg, El= 15 deg.

Expected Result

TMA reaches the commanded position.

Step 46 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 47 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 48 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 49 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 50 Description
Point the Dome and the TMA

- Command the Dome to Pointing 10 to -90deg
- Command the TMA to Pointing 10 at Az= -90 deg, El= 45 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 51 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 52 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -90 deg, El= 45 deg.

Expected Result

TMA reaches the commanded position.

Step 53 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 54 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 55 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 56 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 57 Description
Point the Dome and the TMA

- Command the Dome to Pointing 12 to -90deg
- Command the TMA to Pointing 12 at Az= -90 deg, El= 85.0 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 58 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 59 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -90 deg, El= 85.0 deg.

Expected Result

TMA reaches the commanded position.

Step 60 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 61 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 62 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 63 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 64 Description
Point the Dome and the TMA

- Command the Dome to Pointing 13 to 0deg
- Command the TMA to Pointing 13 at Az= 0 deg, El= 85.0 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 65 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 66 Description

Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target Az= 0 deg, El= 85.0 deg.

Expected Result

TMA reaches the commanded position.

Step 67 Description

Stop the Dome
Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 68 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 69 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 70 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 71 Description
Point the Dome and the TMA

- Command the Dome to Pointing 15 to 0deg
- Command the TMA to Pointing 15 at Az= 0 deg, El= 45 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 72 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 73 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 0 deg, El= 45 deg.

Expected Result

TMA reaches the commanded position.

Step 74 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 75 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 76 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 77 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 78 Description
Point the Dome and the TMA

- Command the Dome to Pointing 16 to 0deg
- Command the TMA to Pointing 16 at Az= 0 deg, El= 15 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 79 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 80 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 0 deg, El= 15 deg.

Expected Result

TMA reaches the commanded position.

Step 81 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 82 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 83 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 84 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 85 Description
Point the Dome and the TMA

- Command the Dome to Pointing 17 to 90deg
- Command the TMA to Pointing 17 at Az= 90 deg, El= 15 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 86 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 87 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 90 deg, El= 15 deg.

Expected Result

TMA reaches the commanded position.

Step 88 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 89 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 90 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 91 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 92 Description
Point the Dome and the TMA

- Command the Dome to Pointing 18 to 90deg
- Command the TMA to Pointing 18 at Az= 90 deg, El= 45 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 93 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 94 Description

Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target Az= 90 deg, El= 45 deg.

Expected Result

TMA reaches the commanded position.

Step 95 Description

Stop the Dome
Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 96 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 97 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 98 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 99 Description
Point the Dome and the TMA

- Command the Dome to Pointing 20 to 90deg
- Command the TMA to Pointing 20 at Az= 90 deg, El= 85.0 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 100 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 101 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 90 deg, El= 85.0 deg.

Expected Result

TMA reaches the commanded position.

Step 102 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 103 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 104 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 105 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 106 Description
Point the Dome and the TMA

- Command the Dome to Pointing 21 to 180deg
- Command the TMA to Pointing 21 at Az= 180 deg, El= 85.0 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 107 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 108 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 180 deg, El= 85.0 deg.

Expected Result

TMA reaches the commanded position.

Step 109 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 110 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 111 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 112 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 113 Description
Point the Dome and the TMA

- Command the Dome to Pointing 23 to 180deg
- Command the TMA to Pointing 23 at Az= 180 deg, El= 45 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 114 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 115 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 180 deg, El= 45 deg.

Expected Result

TMA reaches the commanded position.

Step 116 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 117 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 118 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 119 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 120 Description
Point the Dome and the TMA

- Command the Dome to Pointing 24 to 180deg
- Command the TMA to Pointing 24 at Az= 180 deg, El= 15 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 121 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 122 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 180 deg, El= 15 deg.

Expected Result

TMA reaches the commanded position.

Step 123 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 124 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 125 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 126 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 127 Description
Point the Dome and the TMA

- Command the Dome to Pointing 25 to 270deg
- Command the TMA to Pointing 25 at Az= 270 deg, El= 15 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 128 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 129 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 270 deg, El= 15 deg.

Expected Result

TMA reaches the commanded position.

Step 130 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 131 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 132 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 133 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 134 Description
Point the Dome and the TMA

- Command the Dome to Pointing 26 to 270deg
- Command the TMA to Pointing 26 at Az= 270 deg, El= 45 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 135 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 136 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 270 deg, El= 45 deg.

Expected Result

TMA reaches the commanded position.

Step 137 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 138 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 139 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 140 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 141 Description
Point the Dome and the TMA

- Command the Dome to Pointing 28 to 270deg
- Command the TMA to Pointing 28 at Az= 270 deg, El= 85.0 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 142 Description

Wait for the Dome to reach the commanded position.

Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

The TMA reaches the commanded position.

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 143 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 270 deg, El= 85.0 deg.

Expected Result

TMA reaches the commanded position.

Step 144 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 145 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 146 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 147 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 148 Description
Point the Dome and the TMA

- Command the Dome to Pointing 22 to -270deg
- Command the TMA to Pointing 22 at Az= -270 deg, El= 75 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 149 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 150 Description

Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target Az= -270 deg, El= 75 deg.

Expected Result

TMA reaches the commanded position.

Step 151 Description

Stop the Dome
Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 152 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 153 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 154 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 155 Description
Point the Dome and the TMA

- Command the Dome to Pointing 23 to -180deg
- Command the TMA to Pointing 23 at Az= -180 deg, El= 75 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 156 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 157 Description

Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target Az= -180 deg, El= 75 deg.

Expected Result

TMA reaches the commanded position.

Step 158 Description

Stop the Dome
Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 159 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 160 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 161 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 162 Description
Point the Dome and the TMA

- Command the Dome to Pointing 24 to -90deg
- Command the TMA to Pointing 24 at Az= -90 deg, El= 75 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 163 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 164 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= -90 deg, El= 75 deg.

Expected Result

TMA reaches the commanded position.

Step 165 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 166 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 167 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 168 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 169 Description
Point the Dome and the TMA

- Command the Dome to Pointing 25 to 0deg
- Command the TMA to Pointing 25 at Az= 0 deg, El= 75 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 170 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 171 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 0 deg, El= 75 deg.

Expected Result

TMA reaches the commanded position.

Step 172 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 173 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 174 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 175 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 176 Description
Point the Dome and the TMA

- Command the Dome to Pointing 26 to 90deg
- Command the TMA to Pointing 26 at Az= 90 deg, El= 75 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 177 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 178 Description

Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target Az= 90 deg, El= 75 deg.

Expected Result

TMA reaches the commanded position.

Step 179 Description

Stop the Dome
Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 180 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 181 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 182 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 183 Description
Point the Dome and the TMA

- Command the Dome to Pointing 27 to 180deg
- Command the TMA to Pointing 27 at Az= 180 deg, El= 75 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 184 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 185 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 180 deg, El= 75 deg.

Expected Result

TMA reaches the commanded position.

Step 186 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 187 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 188 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 189 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

Step 190 Description
Point the Dome and the TMA

- Command the Dome to Pointing 28 to 270deg
- Command the TMA to Pointing 28 at Az= 270 deg, El= 75 deg.

Expected Result
The dome starts the movement.
The TMA starts to move.

Step 191 Description

Wait for the Dome to reach the commanded position.
Wait for the TMA to reach the commanded position.

Expected Result

The Dome reaches the commanded position.
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.
The TMA reaches the commanded position.
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 192 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target Az= 270 deg, El= 75 deg.

Expected Result

TMA reaches the commanded position.

Step 193 Description

Stop the Dome

Verify that the Dome is stopped so that it does not move during the observations.

Expected Result

The Dome is stopped.

Step 194 Description

Track position and take images

Star tracking for 20 synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

or

Star tracking for 10 min and take synchronized exposures with 5,4,6 seconds for wide, narrow, fast cameras.

Note: Taking 20 images is good for pointing evaluation..
Taking images for 10 min is needed for tracking evaluation

Test Data
The Dome should not move during the observations.

Expected Result

- The TMA tracks the given position for 10 min, and the cameras take images or 20 images ar take per pointing
- A series of images is successfully taken with the StarTracker and can be seen via RubinTV.

Step 195 Description
Image verification:
Look at RubinTV and verify that astrometry.net found an astrometric solution.

Expected Result
Astrometry.net finds a solution.

Step 196 Description
Offline analysis results
Offline analysis in test case LVV-T2739.

Expected Result
Image quality is sufficient.

5.4.3.4 LVV-T2715 - Configure Observatory Environment for Daytime Operations

Version **1**. Open *LVV-T2715* test case in Jira.

After using the observatory during the nighttime, prepare the observatory for daytime operations.

Preconditions:
The observatory was used during nighttime.

Final comment:

Detailed steps :

Step 1	Description

CSCs

- Transition the CSCs into STANDBY state

Expected Result
All CSCs are in their standbyState.

Step 2	Description

Telescope daytime preparations:

- Switch off or bring into standby the StarTracker and DIMM instruments
- Install the caps on top of the StarTracker telescopes and the DIMM

Expected Result
The caps are installed.

Step 3	Description

Dome:

- Bring the dome into the park position

Until the dome shutter is motorized:

- Send a message to the site manager :
  - confirming that nightly operations have finished
  - asking for a dome closer before the sun starts to shine on the StarTracker and the DIMM.

Expected Result
Dome closure is organized.

Step 4 Description
Auxillary systems daytime preparations:
If needed for daytime operations:

- Switch on the UMA in the morning.
- When available and need to be modified for the day:
  - Oil supply system on standby?
  - Dynalyne into standby?

Expected Result
All auxiliary systems are in the states suitable for daytime operations.

- The UMA is switched on.

Step 5 Description
TMA position in the morning

- Park the TMA in the position needed for the next day.

Expected Result
TMA parked in the corresponding position.

Step 6 Description
Night log

- Close the night log by writing a summary of the nightly events
- Send a link with the summary to the site manager.

Expected Result
The night log is closed.

5.5 Test Cycle LVV-C229

Open test cycle *TMA Pointing and Tracking - Part 2 - Reverse on the Sky Part 1 - 50"- StarTracker* in Jira.

Test Cycle name: TMA Pointing and Tracking - Part 2 - Reverse on the Sky Part 1 - 50"- StarTracker
Status: In Progress

Requirements verification for the pointing and tracking using the Star Tracker and the DIMM on a dedicated mounting plate connector to the top end of the TMA.

5.5.1 Software Version/Baseline

Star Tracker software version:
Dimm software version:
CSC software version:
Analysis software repository:

5.5.2 Configuration

Not provided.

5.5.3 Test Cases in LVV-C229 Test Cycle

5.5.3.1 LVV-T2707 - Evening Summit Tailgate Meeting - TMA and Dome Testing Safety Assurance

Version **2**. Open *LVV-T2707* test case in Jira.

Ensure the safety of observation with the main telescope during nighttime operations.
Tailgate Meeting: Hold a tailgate for the upcoming task with personnel on the summit working during the night. Go over any relevant procedures, roles, and responsibilities.

Note: Version two is for tests that do not involve moving or opening the dome.

Preconditions:
All nonessential personnel has vacated the area.

Final comment:

Detailed steps :

Step 1	Description

Daytime info collection:

- Revise the last Summit Daylog about changes that might influence the work during the night.
- Confirm that all the workers in the TMA and Dome areas have already left. This is best performed during the walk-through at the end of the day.

Expected Result
Is the observatory ready to observe?

Step 2	Description

Night Shift Leader

Identify the Night Shift Leader (first and the second half of the night).

Note: This is the person responsible for deciding when

- the dome is going to be closed.

- to stop observing due to technical issues

Expected Result

One person is identified as the Night Shift Leader for each shift.

Step 3 Description

Tailgate Meeting:

Hold a tailgate for the upcoming task with personnel on the summit working during the night. Go over any relevant procedures, roles, and responsibilities.

1. If the Dome slit doors are not moving automatically, make sure that there are three persons with slit closer training available to close the slit manually.
2. Verify that there are enough persons with driver training available.
3. If the StarTracker is going to be used:
   (a) Clarify who is taking the off the caps in the evening.
   (b) Take a test image before opening the Dome.
   (c) Clarify who is installing the caps in the morning.
4. Discuss if surrounding observatories need to be informed. (Necessary when light is switched on in the dome during the night.)
5. If surrounding observatories need to be informed, clarify who is going to inform them and what information should be transmitted.
6. Check weather conditions and weather forecasts are within the specifications for observations.
7. Describe the tasks planned for the night.

Expected Result

All involved personnel understands their roles and responsibilities.

- If the Dome slit doors are not moving automatically, there are at least two persons with slit closer training available to close the slit manually.
- There are enough people with driver training available.
- If the StarTracker is used,
  - the caps are taken off in the evening by:
  - the test image is taken by:
  - the StarTracker caps are installed in the morning by:
- If surrounding observatories need to be informed,

  - they are informed by:
  - The following information will be transmitted:

- The weather conditions permit us to open the dome and do the planned testing.
- The tasks planned for the night are:

Step 4 Description

Tailgate Meeting – Part II:

If new personnel is participating in the nightly summit activities:

- Clarify that all personnel has PPE.
- Clarify that persons that need to go up into altitude have fall protection training.
- Confirm that we have enough personnel to open/close the dome shutter if required.
- Remind everybody that the emergency phone numbers are on the control room table.

Expected Result

- All personnel has the required PPE.
- Persons that need to go up into altitude have the fall protection training
- Everybody acknowledges that the emergency phone numbers are on the control room table.

Step 5 Description

TMA and Dome contact

Person in charge of the TMA interlocks

Dome responsible

Expected Result

TMA and Dome contacts are known

Step 6 Description

Radio Communication

- Make sure one radio is switched to channel 1, and the volume is high
  - Paramedics, mountain assistants (in replacement of the paramedics), guards, and surrounding observatories are listening to this channel.

- Make sure one radio is switched to channel 3, and the volume is high
  - Rubin's internal coordination channel

Expected Result
The radios are switched on and on high volume.

Step 7 Description
Cars

- Make sure enough cars are available to go to the hotel.
- Make sure the keys for the cars are available.

Expected Result
Sufficient cars and their keys are available.

Step 8 Description
ComCam safety

Put ComCam in a safe state for moving. This includes:

1. CryoTels are under observation for vibrations (i.e. a microphone or webcam is observing them and operating correctly)
2. Turbo pumps are off

Expected Result
ComCam is in a safe state for TMA movement.

Step 9 Description
TMA moving space

Go to the dome and visually verify that there is unrestricted space for the TMA movement.

Expected Result

The space is clear and no objects will be struck when the TMA moves.

Step 10 Description

Alarm system check

Once available:

- Confirm that any audio and visual alarms are operating properly. (Need details on what, if any, alarms should be checked)
- Confirm that the safety systems for earthquakes and fire are working.

Expected Result

All alarms are functioning properly.

- Earthquake alert system is working:
- The fire system is working:

Step 11 Description

LOTO status:

If LOTO procedures are in use:

Set LOTO per (PROCEDURE, attached) at the following locations:

1. LOTO at the Dome
2. LOTO of the TMA Drives

Expected Result

The appropriate panels have been locked out or released.

Step 12 Description

Final walkthrough:

Perform a final walkthrough of the dome. Make sure all personnel is cleared out.

Expected Result
The dome is clear and safe for TMA movement.
The final walkthrough was performed by:

Step 13 Description
Dome closure:
If the Dome door GIS is available:
Exit the Dome, close the door (any details about what specific door)

Expected Result
The GIS system is active.

Step 14 Description
Dome clearance:

The Dome clearance is an EIE task, and they have to sign off.
If EIE is not available, perform these steps:

- Make sure that the dome crane is in the parking position. (Hook up)
- Position of the manlifts. Make sure the manlift supports are stored and are not on the rotation part of the dome.
- Walkthrough and make sure that there are no obstacles to move.

Example Code
https://confluence.lsstcorp.org/display/LTS/Dome+Remote+Software+Control+Procedure

Expected Result
The Dome is cleared for nightly operations.

Step 15 Description
PFlow lift
This is part of EIE's safety check.
If EIE is not available, perform this step:

- The Pflow lift must be stored before moving the dome.

Expected Result
The PFlow lift is stored properly

Step 16 Description
Shutter closer
If you have to close the shutter, the Dome must be under LOTO.
Note: There is no LOTO available at the moment. Use the procedure attached to this test case and the information from the following link:
https://confluence.lsstcorp.org/display/LTS/Dome+Remote+Software+Control+Procedure

Expected Result
The shutter was closed in a safe way.

Step 17 Description
GIS activation:
If the GIS for the Dome is available:

- activate the Dome GIS system.

Expected Result
If possible, the Dome GIS is activated.

Step 18 Description
Signoff
As a signoff, mark this step as passed

Expected Result
Safety Assurance is confirmed to be complete, and testing may proceed.

5.5.3.2 LVV-T2714 - Configure Observatory Environment for Nighttime Operations

Version **1**. Open *LVV-T2714* test case in Jira.

At the beginning of the night, prepare the observatory for nightly operations.

Preconditions:
Dome and the TMA, or at least the TMA must available for observations.

Final comment:

Detailed steps :

Step 1	Description

Telescope preparation:

- Remove the caps on top of the StarTracker telescopes and the DIMM.
- Check the instrument's health status by taking a test image.

Expected Result
The caps are removed.
The test image is taken and stored correspondingly.

Step 2	Description

Calibration images:
Not needed at the moment, to be included if data analysis reveals the need.

- Take 10 "darks" with the StarTracker and the DIMM instruments. Use the same exposure time as for the images.
- Take 10 "sky flats" with the StarTracker and the DIMM instruments.

Expected Result
The Darks and flats are stored in the expected location.

Step 3	Description

Auxillary systems nighttime preparations:

- Switch off the UMA in the afternoon.

Expected Result
The UMA is switched off.

Step 4 Description
Night logging page:
Start the night log similar to the AuxTel night log:

https://confluence.lsstcorp.org/display/LSSTCOM/Night+Logs

Expected Result
Page created with template information.

Step 5 Description
TMA preparation

- Check the Oil Supply System (OSS) on the EUI
- Follow the attached manual to startup the TMA.

Expected Result
The OSS is operational:

Step 6 Description
CSC activation:

Use L.O.V.E to bring the CSC to the enabled state.

Expected Result
All needed CSCs are in the enabled state.

5.5.3.3 LVV-T2731 - StarTracker Pointing and Tracking Test - Reverse Azimuth Pattern

Version **1**. Open *LVV-T2731* test case in Jira.

Collect data with the StarTracker following the reverse azimuth pattern with respect to the forward Azimuth pattern (https://jira.lsstcorp.org/secure/Tests.jspa#/testCase/LVV-T2731)
The azimuth here is pattern 270, 180, 90, 0, -90, -180, -270 deg. Nominal at four elevation angles 15, 45, 70, 85 deg. Minimum at the three angles: 15, 45, 85 deg.

This test

- is foreseen the second of four tests
- takes about one-half summer night

Preconditions:
The safety test case and nightly operations test case have been executed.

Final comment:

Detailed steps :

Step 1	Description

Point the Dome:
Command the Dome to Pointing 1 to 270

Expected Result
The Dome starts moving.

Step 2 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 3 Description

Point the TMA

Command the TMA to Pointing 1 at 270 , 15 .

Expected Result

The TMA starts moving

Step 4 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 5 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 270, 15 .

Expected Result

TMA reaches the commanded position.

Step 6 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 7 Description

On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 8 Description

Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 9 Description

Point the Dome:
Command the Dome to Pointing 2 to 270

Expected Result
The Dome starts moving.

Step 10 Description

Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 11 Description

Point the TMA

Command the TMA to Pointing 2 at 270 , 45 .

Expected Result
The TMA starts moving

Step 12 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 13 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 270, 45 .

Expected Result
TMA reaches the commanded position.

Step 14 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 15 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 16 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 17 Description

Point the Dome:

Command the Dome to Pointing 4 to 270

Expected Result

The Dome starts moving.

Step 18 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 19 Description

Point the TMA

Command the TMA to Pointing 4 at 270 , 85 .

Expected Result

The TMA starts moving

Step 20 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 21 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 270, 85 .

Expected Result

TMA reaches the commanded position.

Step 22 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 23 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 24 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 25 Description
Point the Dome:
Command the Dome to Pointing 5 to 180

Expected Result
The Dome starts moving.

Step 26 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 27 Description
Point the TMA
Command the TMA to Pointing 5 at 180 , 85 .

Expected Result
The TMA starts moving

Step 28 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 29 Description
Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 180, 85 .

Expected Result
TMA reaches the commanded position.

Step 30 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 31 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 32 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 33 Description

Point the Dome:

Command the Dome to Pointing 7 to 180

Expected Result

The Dome starts moving.

Step 34 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 35 Description

Point the TMA

Command the TMA to Pointing 7 at 180 , 45 .

Expected Result

The TMA starts moving

Step 36 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 37 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 180, 45 .

Expected Result

TMA reaches the commanded position.

Step 38 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 39 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 40 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 41 Description
Point the Dome:
Command the Dome to Pointing 8 to 180

Expected Result
The Dome starts moving.

Step 42 Description
Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 43 Description

Point the TMA

Command the TMA to Pointing 8 at 180 , 15 .

Expected Result

The TMA starts moving

Step 44 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 45 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 180, 15 .

Expected Result

TMA reaches the commanded position.

Step 46 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 47 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 48 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 49 Description

Point the Dome:

Command the Dome to Pointing 9 to 90

Expected Result

The Dome starts moving.

Step 50 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 51 Description

Point the TMA

Command the TMA to Pointing 9 at 90 , 15 .

Expected Result
The TMA starts moving

Step 52 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 53 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 90, 15 .

Expected Result
TMA reaches the commanded position.

Step 54 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 55 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 56 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 57 Description
Point the Dome:
Command the Dome to Pointing 10 to 90

Expected Result
The Dome starts moving.

Step 58 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 59 Description
Point the TMA
Command the TMA to Pointing 10 at 90 , 45 .

Expected Result
The TMA starts moving

Step 60 Description
Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 61 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 90, 45 .

Expected Result

TMA reaches the commanded position.

Step 62 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 63 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 64 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 65 Description
Point the Dome:
Command the Dome to Pointing 12 to 90

Expected Result
The Dome starts moving.

Step 66 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 67 Description
Point the TMA
Command the TMA to Pointing 12 at 90 , 85 .

Expected Result
The TMA starts moving

Step 68 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 69 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 90, 85 .

Expected Result

TMA reaches the commanded position.

Step 70 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 71 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 72 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 73 Description

Point the Dome:

Command the Dome to Pointing 13 to 0

Expected Result
The Dome starts moving.

Step 74 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 75 Description
Point the TMA
Command the TMA to Pointing 13 at 0 , 85 .

Expected Result
The TMA starts moving

Step 76 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 77 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 0, 85 .

Expected Result
TMA reaches the commanded position.

Step 78 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 79 Description

On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 80 Description

Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 81 Description

Point the Dome:
Command the Dome to Pointing 15 to 0

Expected Result
The Dome starts moving.

Step 82 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 83 Description

Point the TMA

Command the TMA to Pointing 15 at 0 , 45 .

Expected Result

The TMA starts moving

Step 84 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 85 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 0, 45 .

Expected Result

TMA reaches the commanded position.

Step 86 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 87 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 88 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 89 Description

Point the Dome:

Command the Dome to Pointing 16 to 0

Expected Result

The Dome starts moving.

Step 90 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 91 Description

Point the TMA

Command the TMA to Pointing 16 at 0 , 15 .

Expected Result

The TMA starts moving

Step 92 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 93 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 0, 15 .

Expected Result

TMA reaches the commanded position.

Step 94 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 95 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 96 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 97 Description
Point the Dome:
Command the Dome to Pointing 17 to -90

Expected Result
The Dome starts moving.

Step 98 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 99 Description
Point the TMA
Command the TMA to Pointing 17 at -90 , 15 .

Expected Result
The TMA starts moving

Step 100 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 101 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -90, 15 .

Expected Result

TMA reaches the commanded position.

Step 102 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 103 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 104 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 105 Description

Point the Dome:

Command the Dome to Pointing 18 to -90

Expected Result

The Dome starts moving.

Step 106 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 107 Description

Point the TMA

Command the TMA to Pointing 18 at -90 , 45 .

Expected Result

The TMA starts moving

Step 108 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 109 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -90, 45 .

Expected Result

TMA reaches the commanded position.

Step 110 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 111 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 112 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 113 Description

Point the Dome:

Command the Dome to Pointing 20 to -90

Expected Result

The Dome starts moving.

Step 114 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 115 Description

Point the TMA

Command the TMA to Pointing 20 at -90 , 85 .

Expected Result

The TMA starts moving

Step 116 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 117 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -90, 85 .

Expected Result

TMA reaches the commanded position.

Step 118 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 119 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 120 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 121 Description

Point the Dome:

Command the Dome to Pointing 21 to 180

Expected Result

The Dome starts moving.

Step 122 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 123 Description

Point the TMA

Command the TMA to Pointing 21 at -180 , 85 .

Expected Result

The TMA starts moving

Step 124 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 125 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -180, 85 .

Expected Result

TMA reaches the commanded position.

Step 126 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 127	Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 128	Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 129	Description

Point the Dome:

Command the Dome to Pointing 23 to 180

Expected Result

The Dome starts moving.

Step 130	Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 131	Description

Point the TMA

Command the TMA to Pointing 23 at -180 , 45 .

Expected Result

The TMA starts moving

Step 132	Description

Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 133 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target -180, 45 .

Expected Result
TMA reaches the commanded position.

Step 134 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 135 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 136 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 137 Description

Point the Dome:

Command the Dome to Pointing 24 to 180

Expected Result

The Dome starts moving.

Step 138 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 139 Description

Point the TMA

Command the TMA to Pointing 24 at -180 , 15 .

Expected Result

The TMA starts moving

Step 140 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 141 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -180, 15 .

Expected Result
TMA reaches the commanded position.

Step 142 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 143 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 144 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 145 Description

Point the Dome:

Command the Dome to Pointing 25 to -270

Expected Result

The Dome starts moving.

Step 146 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 147 Description

Point the TMA

Command the TMA to Pointing 25 at -270 , 15 .

Expected Result

The TMA starts moving

Step 148 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 149 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -270, 15 .

Expected Result

TMA reaches the commanded position.

Step 150 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 151 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 152 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 153 Description

Point the Dome:

Command the Dome to Pointing 26 to -270

Expected Result

The Dome starts moving.

Step 154 Description

Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 155 Description
Point the TMA
Command the TMA to Pointing 26 at -270 , 45 .

Expected Result
The TMA starts moving

Step 156 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 157 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target -270, 45 .

Expected Result
TMA reaches the commanded position.

Step 158 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 159 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 160 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 161 Description

Point the Dome:

Command the Dome to Pointing 28 to -270

Expected Result

The Dome starts moving.

Step 162 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 163 Description

Point the TMA

Command the TMA to Pointing 28 at -270 , 85 .

Expected Result

The TMA starts moving

Step 164 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 165 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -270, 85 .

Expected Result

TMA reaches the commanded position.

Step 166 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 167 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 168 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 169 Description

Point the Dome:

Command the Dome to Pointing 22 to 270

Expected Result

The Dome starts moving.

Step 170 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 171 Description

Point the TMA

Command the TMA to Pointing 22 at 270 , 75 .

Expected Result

The TMA starts moving

Step 172 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 173 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 270, 75 .

Expected Result

TMA reaches the commanded position.

Step 174 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 175 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 176 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 177 Description
Point the Dome:
Command the Dome to Pointing 23 to 180

Expected Result
The Dome starts moving.

Step 178 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 179 Description
Point the TMA
Command the TMA to Pointing 23 at 180 , 75 .

Expected Result
The TMA starts moving

Step 180 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 181 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 180, 75 .

Expected Result

TMA reaches the commanded position.

Step 182 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 183 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 184 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 185 Description

Point the Dome:

Command the Dome to Pointing 24 to 90

Expected Result
The Dome starts moving.

Step 186 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 187 Description
Point the TMA
Command the TMA to Pointing 24 at 90 , 75 .

Expected Result
The TMA starts moving

Step 188 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 189 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 90, 75 .

Expected Result
TMA reaches the commanded position.

Step 190 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 191 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 192 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 193 Description

Point the Dome:

Command the Dome to Pointing 25 to 0

Expected Result

The Dome starts moving.

Step 194 Description

Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 195 Description
Point the TMA
Command the TMA to Pointing 25 at 0 , 75 .

Expected Result
The TMA starts moving

Step 196 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 197 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 0, 75 .

Expected Result
TMA reaches the commanded position.

Step 198 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 199 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 200 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 201 Description

Point the Dome:

Command the Dome to Pointing 26 to -90

Expected Result

The Dome starts moving.

Step 202 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 203 Description

Point the TMA

Command the TMA to Pointing 26 at -90 , 75 .

Expected Result

The TMA starts moving

Step 204 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 205 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -90, 75 .

Expected Result

TMA reaches the commanded position.

Step 206 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 207 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 208 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 209 Description
Point the Dome:
Command the Dome to Pointing 27 to -180

Expected Result
The Dome starts moving.

Step 210 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 211 Description
Point the TMA
Command the TMA to Pointing 27 at -180 , 75 .

Expected Result
The TMA starts moving

Step 212 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 213 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -180, 75 .

Expected Result

TMA reaches the commanded position.

Step 214 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 215 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 216 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 217 Description

Point the Dome:

Command the Dome to Pointing 28 to -270

Expected Result

The Dome starts moving.

Step 218 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 219 Description

Point the TMA

Command the TMA to Pointing 28 at -270 , 75 .

Expected Result

The TMA starts moving

Step 220 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 221 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -270, 75 .

Expected Result

TMA reaches the commanded position.

Step 222 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 223 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 224 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

5.5.3.4 LVV-T2715 - Configure Observatory Environment for Daytime Operations

Version **1**. Open *LVV-T2715* test case in Jira.

After using the observatory during the nighttime, prepare the observatory for daytime operations.

Preconditions:
The observatory was used during nighttime.

Final comment:

Detailed steps :

Step 1	Description

CSCs

- Transition the CSCs into STANDBY state

Expected Result
All CSCs are in their standbyState.

Step 2	Description

Telescope daytime preparations:

- Switch off or bring into standby the StarTracker and DIMM instruments
- Install the caps on top of the StarTracker telescopes and the DIMM

Expected Result
The caps are installed.

Step 3	Description

Dome:

- Bring the dome into the park position

Until the dome shutter is motorized:

- Send a message to the site manager :
  - confirming that nightly operations have finished
  - asking for a dome closer before the sun starts to shine on the StarTracker and the DIMM.

Expected Result
Dome closure is organized.

Step 4 Description
Auxillary systems daytime preparations:
If needed for daytime operations:

- Switch on the UMA in the morning.
- When available and need to be modified for the day:
  - Oil supply system on standby?
  - Dynalyne into standby?

Expected Result
All auxiliary systems are in the states suitable for daytime operations.

- The UMA is switched on.

Step 5 Description
TMA position in the morning

- Park the TMA in the position needed for the next day.

Expected Result
TMA parked in the corresponding position.

Step 6	Description

Expected Result

Step 7	Description

Night log

- Close the night log by writing a summary of the nightly events
- Send a link with the summary to the site manager.

Expected Result
The night log is closed.

5.6 Test Cycle LVV-C230

Open test cycle *TMA Pointing and Tracking - Part 4 - Offset 0.2" + Slew and Settle + TMA Tracking Jitter – Using the DIMM.* in Jira.

Test Cycle name: TMA Pointing and Tracking - Part 4 - Offset 0.2" + Slew and Settle + TMA Tracking Jitter – Using the DIMM.
Status: In Progress

Data collection for the pointing and tracking requirements verification using the Star Tracker and the DIMM.
Star Tracker and the DIMM will be mounted on dedicated connector plates to the top end of the TMA.

Slew and Settle:

- Track on position one, slew to position two, and Track on position two.

- In four seconds, the mount should settle.
- Timestamps come from the EFD.
- acquire a bright star with the DIMM
- initiate exposure series at ~75 Hz for 15s. Mean and STD of the centroid
- Offset to 3.5 deg. To be reached in 4s. The trigger is the offset command. We wait for the MCS command + a reasonable amount of time. To be done at survey cadence. No images at the offset position (likely no bright star there).
- Issue the second command to go to the first position. We stay for 35 seconds.
- We use the same star and 5 times 3.5 AZ, 5 times 3.5 deg EL, and 5 x 3.5 deg random positions.

5.6.1 Software Version/Baseline

Star Tracker software version:
Dimm software version:
CSC software version:
Analysis software repository:

5.6.2 Configuration

Not provided.

5.6.3 Test Cases in LVV-C230 Test Cycle

5.6.3.1 LVV-T2707 - Evening Summit Tailgate Meeting - TMA and Dome Testing Safety Assurance

Version **2**. Open *LVV-T2707* test case in Jira.

Ensure the safety of observation with the main telescope during nighttime operations.
Tailgate Meeting: Hold a tailgate for the upcoming task with personnel on the summit working during the night. Go over any relevant procedures, roles, and responsibilities.

Note: Version two is for tests that do not involve moving or opening the dome.

Preconditions:
All nonessential personnel has vacated the area.

Final comment:

Detailed steps :

Step 1	Description

Expected Result

5.6.3.2 LVV-T2714 - Configure Observatory Environment for Nighttime Operations

Version **1**. Open *LVV-T2714* test case in Jira.

At the beginning of the night, prepare the observatory for nightly operations.

Preconditions:
Dome and the TMA, or at least the TMA must available for observations.

Final comment:

Detailed steps :

Step 1	Description

Telescope preparation:

- Remove the caps on top of the StarTracker telescopes and the DIMM.

- Check the instrument's health status by taking a test image.

Expected Result
The caps are removed.
The test image is taken and stored correspondingly.

Step 2 Description
Calibration images:
Not needed at the moment, to be included if data analysis reveals the need.

- Take 10 "darks" with the StarTracker and the DIMM instruments. Use the same exposure time as for the images.
- Take 10 "sky flats" with the StarTracker and the DIMM instruments.

Expected Result
The Darks and flats are stored in the expected location.

Step 3 Description
Auxillary systems nighttime preparations:

- Switch off the UMA in the afternoon.

Expected Result
The UMA is switched off.

Step 4 Description
Night logging page:
Start the night log similar to the AuxTel night log:

https://confluence.lsstcorp.org/display/LSSTCOM/Night+Logs

Expected Result
Page created with template information.

Step 5 Description
TMA preparation

- Check the Oil Supply System (OSS) on the EUI
- Follow the attached manual to startup the TMA.

Expected Result
The OSS is operational:

Step 6 Description
CSC activation:

Use L.O.V.E to bring the CSC to the enabled state.

Expected Result
All needed CSCs are in the enabled state.

5.6.3.3 LVV-T2732 - StarTracker Pointing and Tracking Test - Pointing Offset 0.2" - Slew and Settle - TMA Tracking Jitter Validation – DIMM

Version **1**. Open *LVV-T2732* test case in Jira.

The objective of this test is

- the TMA achieves pointing repeatability within the value of 1arcsec RMS for any motion within the pointing range. (LTS-103-REQ-0011-V-01: 2.1.5_1)
- to characterize the settling time and settling behavior after a move.

The observations for the TMA settling characterization are done by

1. Centering star on the DIMM
2. Slew off and back to center a star with the active damping active.
3. Slew off and back to center a star with the active damping deactivated.
4. Analyze the data using LVV-T2749

TMA Tracking Jitter Validation:

- Using the DIMM. Tracking siderially is obligatory.
- Encoder stream at 50 Hz, Nyquist sampling at 100 -150 Hz.
- The standard frequency is 75Hz smaller frames allow for higher.
- StarTracker and DIMM are mounted and working at the same time.

NOTE:

- The Dome needs an offset of a min of 0.6 deg for the TMA motion during tracking, or else the Dome would need to be moved.
- If not stated otherwise, the TMA damping is turned on.

Preconditions:
These preconditions are taken from the FAT:

- The TMA interlock system is fully operative and tested.
- MCS is ready for operation.
- The encoder system is active and calibrated.
- All the TMA subsystems hardware (mechanical and electrical) is available for operation and fully connected.

- No alarms are active in TMA IS.

Preconditions for the summit tests:

This test case needs the DIMM to reach the needed precision. The DIMM must be installed and working.

Final comment:

Detailed steps :

Step 1 Description

Position the dome

Command the Dome to Pointing 1 to temp

Expected Result

The Dome starts moving.

Step 2 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 3 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 1 at -270 , 15 .

Expected Result

The TMA starts moving.

Step 4 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 5 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 6 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 1 at -270, 15. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 7 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 1 at -270 + DIMM offset, 15 + DIMM offset.

- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 8 Description

Position the dome

Command the Dome to Pointing 2 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 9 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 10 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 2 at -270 , 45 .

Expected Result

The TMA starts moving.

Step 11 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 12 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 13 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 2 at -270, 45. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 14 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 2 at -270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 15	Description

Position the dome

Command the Dome to Pointing 3 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 16	Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 17	Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 3 at -270 , 75 .

Expected Result

The TMA starts moving.

Step 18	Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 19	Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 20 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 3 at -270, 75. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 21 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 3 at -270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.

- DIMM image quality is sufficient

Step 22 Description

Position the dome

Command the Dome to Pointing 4 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 23 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 24 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 4 at -270 , 86.5 .

Expected Result

The TMA starts moving.

Step 25 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 26 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).

- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 27 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 4 at -270, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 28 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 4 at -270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 29 Description

Position the dome

Command the Dome to Pointing 5 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 30 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 31 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 5 at -180 , 86.5 .

Expected Result

The TMA starts moving.

Step 32 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 33 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 34 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 5 at -180, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 35 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 5 at -180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 36 Description

Position the dome

Command the Dome to Pointing 6 to {Dome AZ}

Expected Result
The Dome starts moving.

Step 37 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 38 Description
Point the TMA to (Az, El)-pattern position
Point the TMA to Pointing 6 at -180 , 75 .

Expected Result
The TMA starts moving.

Step 39 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 40 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 41 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 6 at -180, 75. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 42 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 6 at -180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 43 Description

Position the dome

Command the Dome to Pointing 7 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 44 Description

Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 45 Description
Point the TMA to (Az, El)-pattern position
Point the TMA to Pointing 7 at -180 , 45 .

Expected Result
The TMA starts moving.

Step 46 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 47 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 48 Description

Move TMA to the 1. random distance of 3.5deg
Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 7 at -180, 45. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 49 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 7 at -180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 50 Description
Position the dome
Command the Dome to Pointing 8 to {Dome AZ}

Expected Result
The Dome starts moving.

Step 51 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 52 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 8 at -180 , 15 .

Expected Result

The TMA starts moving.

Step 53 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 54 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 55 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 8 at -180, 15. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 56 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 8 at -180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 57 Description

Position the dome

Command the Dome to Pointing 9 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 58 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 59 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 9 at -90 , 15 .

Expected Result
The TMA starts moving.

Step 60 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 61 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 62 Description
Move TMA to the 1. random distance of 3.5deg
Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 9 at -90, 15. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.

- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 63 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 9 at -90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 64 Description

Position the dome

Command the Dome to Pointing 10 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 65 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 66 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 10 at -90 , 45 .

Expected Result

The TMA starts moving.

Step 67 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 68 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 69 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 10 at -90, 45. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 70 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 10 at -90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 71 Description

Position the dome

Command the Dome to Pointing 11 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 72 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 73 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 11 at -90 , 75 .

Expected Result

The TMA starts moving.

Step 74 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 75 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 76 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 11 at -90, 75. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 77 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 11 at -90 + DIMM offset, 75 + DIMM offset.

- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 78 Description

Position the dome

Command the Dome to Pointing 12 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 79 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 80 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 12 at -90 , 86.5 .

Expected Result

The TMA starts moving.

Step 81 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 82 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 83 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 12 at -90, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 84 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 12 at -90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 85 Description

Position the dome

Command the Dome to Pointing 13 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 86 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 87 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 13 at 0 , 86.5 .

Expected Result

The TMA starts moving.

Step 88 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 89 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 90 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 91 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.

- DIMM image quality is sufficient

Step 92 Description

Position the dome

Command the Dome to Pointing 14 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 93 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 94 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 14 at 0 , 75 .

Expected Result

The TMA starts moving.

Step 95 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 96 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).

- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 97 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 98 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 99 Description

Position the dome
Command the Dome to Pointing 15 to {Dome AZ}

Expected Result
The Dome starts moving.

Step 100 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 101 Description
Point the TMA to (Az, El)-pattern position
Point the TMA to Pointing 15 at 0 , 45 .

Expected Result
The TMA starts moving.

Step 102 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 103 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 104 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 105 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 106 Description

Position the dome

Command the Dome to Pointing 16 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 107 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 108 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 16 at 0 , 15 .

Expected Result

The TMA starts moving.

Step 109 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 110 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 111 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 112 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 113 Description

Position the dome

Command the Dome to Pointing 17 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 114 Description

Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 115 Description
Point the TMA to (Az, El)-pattern position
Point the TMA to Pointing 17 at 90 , 15 .

Expected Result
The TMA starts moving.

Step 116 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 117 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 118 Description

Move TMA to the 1. random distance of 3.5deg
Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 119 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 120 Description
Position the dome
Command the Dome to Pointing 18 to {Dome AZ}

Expected Result
The Dome starts moving.

Step 121 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 122 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 18 at 90 , 45 .

Expected Result

The TMA starts moving.

Step 123 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 124 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 125 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 126 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 127 Description

Position the dome

Command the Dome to Pointing 19 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 128 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 129 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 19 at 90 , 75 .

Expected Result
The TMA starts moving.

Step 130 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 131 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 132 Description
Move TMA to the 1. random distance of 3.5deg
Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.

- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 133 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 134 Description

Position the dome

Command the Dome to Pointing 20 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 135 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 136 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 20 at 90 , 86.5 .

Expected Result

The TMA starts moving.

Step 137 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 138 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 139 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 140 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 141 Description

Position the dome

Command the Dome to Pointing 21 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 142 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 143 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 21 at 180 , 86.5 .

Expected Result

The TMA starts moving.

Step 144 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 145 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 146 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 147 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.

- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 148 Description

Position the dome

Command the Dome to Pointing 22 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 149 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 150 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 22 at 180 , 75 .

Expected Result

The TMA starts moving.

Step 151 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 152 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 153 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 154 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 155 Description

Position the dome

Command the Dome to Pointing 23 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 156 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 157 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 23 at 180 , 45 .

Expected Result

The TMA starts moving.

Step 158 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 159 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 160 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 161 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.

- DIMM image quality is sufficient

Step 162 Description

Position the dome

Command the Dome to Pointing 24 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 163 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 164 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 24 at 180 , 15 .

Expected Result

The TMA starts moving.

Step 165 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 166 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).

- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 167 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 168 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 169 Description

Position the dome
Command the Dome to Pointing 25 to {Dome AZ}

Expected Result
The Dome starts moving.

Step 170 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 171 Description
Point the TMA to (Az, El)-pattern position
Point the TMA to Pointing 25 at 270 , 15 .

Expected Result
The TMA starts moving.

Step 172 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 173 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 174 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 175 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 176 Description

Position the dome

Command the Dome to Pointing 26 to {Dome AZ}

Expected Result
The Dome starts moving.

Step 177 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 178 Description
Point the TMA to (Az, El)-pattern position
Point the TMA to Pointing 26 at 270 , 45 .

Expected Result
The TMA starts moving.

Step 179 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 180 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 181 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 182 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 183 Description

Position the dome

Command the Dome to Pointing 27 to {Dome AZ}

Expected Result

The Dome starts moving.

Step 184 Description

Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 185 Description
Point the TMA to (Az, El)-pattern position
Point the TMA to Pointing 27 at 270 , 75 .

Expected Result
The TMA starts moving.

Step 186 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 187 Description
Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 188 Description

Move TMA to the 1. random distance of 3.5deg
Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 189 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 190 Description
Position the dome
Command the Dome to Pointing 28 to {Dome AZ}

Expected Result
The Dome starts moving.

Step 191 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 192 Description

Point the TMA to (Az, El)-pattern position

Point the TMA to Pointing 28 at 270 , 86.5 .

Expected Result

The TMA starts moving.

Step 193 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 194 Description

Find DIMM Object and DIMM Pattern Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 195 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 196 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 197 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 198 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 199 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 200 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 201 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 202 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 203 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 204 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 205 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 206 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 207 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 208 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 209 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 210 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 211 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 212 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 213 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 214 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 215 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 216 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 217 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 218 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 219 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 220 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 221 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 222 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 223 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 224 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 225 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 226 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 227 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 228 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 229 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 230 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 231 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 232 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 233 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 234 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 235 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 236 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 237 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 238 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 239 Description

Move TMA to the 1. random distance of 3.5deg

Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

- The TMA reaches the commanded offset position.
- The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition*inPosition parameter = true.

Step 240 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 241 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 242 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 243 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 244 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 245 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 246 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 247 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 248 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 249 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 250 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 251 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 252 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 253 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 254 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 255 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 256 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 257 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 258 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 259 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 260 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 261 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 262 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 263 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 264 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 265 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 266 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 267 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 268 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 269 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 270 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 271 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 272 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 273 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 274 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 275 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 276 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 277 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 278 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 279 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 280 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 281 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 282 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 283 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 284 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 285 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 286 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 287 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 288 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 289 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 290 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 291 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 292 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 293 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 294 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 295 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 296 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 297 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 298 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 299 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 300 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 301 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 302 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 303 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 304 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 305 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 306 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 307 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 308 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 309 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 310 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 311 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 312 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 313 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 314 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 315 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 316 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 317 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 318 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 319 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 320 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 321 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 322 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 323 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 324 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 325 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 326 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 327 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 328 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position.
- DIMM image quality is sufficient

Step 329 Description
Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 1 at -270, 15. Record the exact position of the offset in AZ and El.

Expected Result
The TMA reaches the commanded offset position.

Step 330 Description
Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 2 at -270, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 331 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 3 at -270, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 332 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 4 at -270, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 333 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 5 at -180, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 334 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 6 at -180, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 335 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 7 at -180, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 336 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 8 at -180, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 337 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 9 at -90, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 338 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 10 at -90, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 339 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 11 at -90, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 340 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 12 at -90, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 341 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 342 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 343	Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El.

Expected Result
The TMA reaches the commanded offset position.

Step 344	Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El.

Expected Result
The TMA reaches the commanded offset position.

Step 345	Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 346 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 347 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 348 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 349 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 350 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 351 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 352 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 353 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 354 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 355 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 356 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 357 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 358 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 359 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 360 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 361 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 362 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 363 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 364 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 365 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 366 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 367 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 368 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 369 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 370 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 371 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 372 Description

Move TMA to the 2. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El.

Expected Result

The TMA reaches the commanded offset position.

Step 373 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 374 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 375 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 376 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 377 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 378 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 379 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 380 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 381 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 382 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 383 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 384 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 385 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 386 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 387 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 388 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 389 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 390 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 391 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 392 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 393 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 394 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 395 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 396 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 397 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 398 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 399 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 400 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 401 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 402 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 403 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 404 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 405 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 406 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 407 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 408 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 409 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 410 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 411 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 412 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 413 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 414 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 415 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 416 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 417 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 418 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 419 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 420 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 421 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 422 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 423 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 424 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 425 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 426 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 427 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 428 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 429 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 430 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 431 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 432 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 433 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 434 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 435 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 436 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 437 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 438 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 439 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 440 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 441 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 442 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 443 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 444 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 445 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 446 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 447 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 448 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 449 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 450 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 451 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 452 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 453 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 454 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 455 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 456 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 457 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 458 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 459 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 460 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 461 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 1 at -270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 462 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 2 at -270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 463 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 3 at -270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 464 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 4 at -270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 465 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 5 at -180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 466 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 6 at -180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 467 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 7 at -180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 468 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 8 at -180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 469 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 9 at -90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 470 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 10 at -90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 471 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 11 at -90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 472 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 12 at -90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 473 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 474 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 475 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 476 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 477 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 478 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 479 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 480 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 481 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 482 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 483 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 484 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 485 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 486 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 487 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 488 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 489 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 490 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 491 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 492 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 493 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 494 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 495 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 496 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 497 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 498 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 499 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 500 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 501 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 502 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 503 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 504 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 505 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 1 at -270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 506 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 2 at -270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 507 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 3 at -270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 508 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 4 at -270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 509 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 5 at -180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 510 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 6 at -180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 511 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 7 at -180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 512 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 8 at -180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 513 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 9 at -90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 514 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 10 at -90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 515 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 11 at -90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 516 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 12 at -90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 517 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 518 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 519 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 520 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 521 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 522 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 523 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 524 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 525 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 526 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 527 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 528 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 529 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 530 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 531 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 532 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 533 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 534 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 535 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 536 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 537 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 538 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 539 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 540 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 541 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 542 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 543 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 544 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 545 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 546 Description
Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 547 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 548 Description

Move TMA to the 3. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 549 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.

- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 550 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 551 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).

- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 552 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 553 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 554 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 555 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 556 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 557 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 558 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 559 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 560 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 561 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 562 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 563 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 564 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 565 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 566 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 567 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 568 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 569 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 570 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 571 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 572 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 573 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 574 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 575 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 576 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 577 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 578 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 579 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 580 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 581 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 582 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 583 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 584 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 585 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 586 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 587 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 588 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 589 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 590 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 591 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 592 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 593 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 594 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 595 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 596 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 597 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 598 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 599 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 600 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 601 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 602 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 603 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 604 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 605 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 606 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 607 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 608 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 609 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 610 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 611 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 612 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 613 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 614 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 615 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 616 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 617 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 618 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 619 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 620 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 621 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 622 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 623 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 624 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 625 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 626 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 627 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 628 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 629 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 630 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 631 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 632 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 633 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 634 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 635 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 636 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 637 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 1 at -270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 638 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 2 at -270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 639 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 3 at -270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 640 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 4 at -270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 641 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 5 at -180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 642 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 6 at -180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 643 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 7 at -180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 644 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 8 at -180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 645 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 9 at -90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 646 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 10 at -90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 647 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 11 at -90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 648 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 12 at -90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 649 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 650 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 651 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 652 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 653 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 654 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 655 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 656 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 657 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 658 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 659 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 660 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 661 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 662 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 663 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 664 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 665 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 666 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 667 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 668 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 669 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 670 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 671 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 672 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 673 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 674 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 675 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 676 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 677 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 678 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 679 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 680 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 681 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 1 at -270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 682 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 2 at -270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 683 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 3 at -270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 684 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 4 at -270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 685 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 5 at -180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 686 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 6 at -180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 687 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 7 at -180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 688 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 8 at -180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 689 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 9 at -90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 690 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 10 at -90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 691 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 11 at -90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 692 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 12 at -90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 693 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 694 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 695 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 696 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 697 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 698 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 699 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 700 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 701 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 702 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 703 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 704 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 705 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 706 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 707 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 708 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 709 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 710 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 711 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 712 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 713 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 714 Description
Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 715 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 716 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 717 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 718 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 719 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 720 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 721 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 722 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 723 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 724 Description

Move TMA to the 4. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 725 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.

- AZ and EL offsets are available.

Step 726 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 727 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 728 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 729 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 730 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 731 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 732 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 733 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 734 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 735 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 736 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 737 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 738 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 739 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 740 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 741 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 742 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 743 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 744 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 745 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 746 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 747 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 748 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 749 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 750 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 751 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 752 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 753 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 754 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 755 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 756 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 757 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 758 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 759 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 760 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 761 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 762 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 763 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 764 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 765 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 766 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 767 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 768 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 769 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 770 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 771 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 772 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 773 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 774 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 775 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 776 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 777 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 778 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 779 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 780 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 781 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 782 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 783 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 784 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 785 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 786 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 787 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 788 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 789 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 790 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 791 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 792 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 793 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 794 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 795 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 796 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 797 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 798 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 799 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 800 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 801 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 802 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 803 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 804 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 805 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 806 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 807 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 808 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 809 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 810 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 811 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 812 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 813 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 1 at -270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 814 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 2 at -270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 815 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 3 at -270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 816 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 4 at -270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 817 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 5 at -180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 818 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 6 at -180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 819 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 7 at -180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 820 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 8 at -180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 821 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 9 at -90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 822 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 10 at -90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 823 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 11 at -90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 824 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 12 at -90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 825 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 826 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 827 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 828 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 829 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 830 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 831 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 832 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 833 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 834 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 835 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 836 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 837 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 838 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 839 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 840 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 841 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 842 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 843 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 844 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 845 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 846 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 847 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 848 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 849 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 850 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 851 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 852 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 853 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 854 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 855 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 856 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 857 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 1 at -270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 858 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 2 at -270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 859 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 3 at -270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 860 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 4 at -270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 861 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 5 at -180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 862 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 6 at -180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 863 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 7 at -180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 864 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 8 at -180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 865 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 9 at -90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 866 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 10 at -90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 867 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 11 at -90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 868 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 12 at -90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 869 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 870 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 871 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 872 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 873 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 874 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 875 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 876 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 877 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 878 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 879 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 880 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 881 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 882 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 883 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 884 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 13 at 0, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 885 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 886 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 14 at 0, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 887 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 15 at 0, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 888	Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 16 at 0, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 889	Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 17 at 90, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 890	Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 18 at 90, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 891 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 19 at 90, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 892 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 20 at 90, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 893 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 21 at 180, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 894 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 22 at 180, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 895 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 23 at 180, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 896 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 24 at 180, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 897 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 25 at 270, 15. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 898 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 26 at 270, 45. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 899 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 27 at 270, 75. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 900 Description

Move TMA to the 5. random distance of 3.5deg

- Point the TMA to a random 3.5 deg combined offset in AZ and EL from Pointing 28 at 270, 86.5. Record the exact position of the offset in AZ and El

Expected Result

- The TMA reaches the commanded offset position.

Step 901 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 902 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.

- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 903 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 904 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).

- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 905 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 906 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 907 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 908 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 909 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 910 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 911 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 912 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 913 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 914 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 915 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 916 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 917 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 918 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 919 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 920 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 921 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 922 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 923 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 924 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 925 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 926 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 927 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 928 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 929 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 930 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 931 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 932 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 933 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 934 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 935 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 936 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 937 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.

- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 938 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 939 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 940 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 941 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 942 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 943 Description

Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 944 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 945 Description
Find DIMM Object and DIMM Offset

- While tracking, take a 10-sec exposure with the StarTracker.
- Load the image into an image viewer.
- Overlay the GAIA catalog.
- Select a star brighter than XXX mag (bright enough for the DIMM).
- Calculate the pixel offset between the StarTracker and the DIMM.
- Transform the offset into AZ and EL offsets.

Expected Result

- An image was successfully taken with the StarTracker and is of sufficient quality.
- AZ and EL offsets are available.

Step 946 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 947 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 948 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 949 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 950 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 951 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 952 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 953 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 954 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 955 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 956 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 957 Description
Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 958 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 959 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 960 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 961 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 962 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 963 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 964 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 965 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 966 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 967 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 968 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 969 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 970 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 971 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 972 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 973 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 974 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 975 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 976 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 977 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 978 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 979 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 980 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 981 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 982 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 983 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 984 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 985 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 986 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 987 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 988 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 989 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 990 Description

Move TMA to the DIMM position and Take DIMM images

- Command the TMA to the DIMM position by applying the offsets
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the DIMM position.
- DIMM imaging quality is sufficient.

Step 991 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 1 at -270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 992 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 2 at -270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 993 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 3 at -270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 994 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 4 at -270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 995 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 5 at -180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 996 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 6 at -180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 997 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 7 at -180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 998 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 8 at -180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 999 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 9 at -90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1000 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 10 at -90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1001 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 11 at -90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1002 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 12 at -90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1003 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1004 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1005 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1006 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1007 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1008 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1009 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1010 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1011 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1012 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1013 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1014 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1015 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1016 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1017 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 12 at -90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1018 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1019 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 13 at 0 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1020 Description
Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1021 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 14 at 0 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1022 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 15 at 0 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1023 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 16 at 0 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1024 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 17 at 90 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1025 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 18 at 90 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1026 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 19 at 90 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1027 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 20 at 90 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1028 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 21 at 180 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1029 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 22 at 180 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1030 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 23 at 180 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1031 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 24 at 180 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1032 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 25 at 270 + DIMM offset, 15 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1033 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 26 at 270 + DIMM offset, 45 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1034 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 27 at 270 + DIMM offset, 75 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1035 Description

Point the TMA to (Az, El)-pattern position + DIMM pattern offset and take DIMM images

- Point the TMA back to Pointing 28 at 270 + DIMM offset, 86.5 + DIMM offset.
- While tracking, take DIMM images with XXXs exposure time and inspect the quality.

Expected Result

- TMA reaches the position
- DIMM image quality is sufficient

Step 1036 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1037 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1038 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1039 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1040 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1041 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1042 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1043 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1044 Description
TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1045 Description
TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1046 Description
TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1047 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1048 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1049 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.

- The inPosition event arrives later to the EFD.

Step 1050 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1051 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1052 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1053 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1054 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1055 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1056 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1057 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1058 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1059 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1060 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1061 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1062 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1063 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1064 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1065 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1066 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1067 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1068 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1069 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1070 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1071 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.

- The inPosition event arrives later to the EFD.

Step 1072 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1073 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1074 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1075 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1076 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1077 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1078 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1079 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

Step 1080 Description

TMA Settle Characterisation:

Repeat the previous step with the TMA damping turned off.

Expected Result

- The TMA takes longer to settle.
- The inPosition event arrives later to the EFD.

5.6.3.4 LVV-T2715 - Configure Observatory Environment for Daytime Operations

Version **1**. Open *LVV-T2715* test case in Jira.

After using the observatory during the nighttime, prepare the observatory for daytime operations.

Preconditions:
The observatory was used during nighttime.

Final comment:

Detailed steps :

Step 1	Description

CSCs

- Transition the CSCs into STANDBY state

Expected Result
All CSCs are in their standbyState.

Step 2	Description

Telescope daytime preparations:

- Switch off or bring into standby the StarTracker and DIMM instruments
- Install the caps on top of the StarTracker telescopes and the DIMM

Expected Result
The caps are installed.

Step 3	Description

Dome:

- Bring the dome into the park position

Until the dome shutter is motorized:

- Send a message to the site manager :
  - confirming that nightly operations have finished
  - asking for a dome closer before the sun starts to shine on the StarTracker and the DIMM.

Expected Result
Dome closure is organized.

Step 4 Description
Auxillary systems daytime preparations:
If needed for daytime operations:

- Switch on the UMA in the morning.
- When available and need to be modified for the day:
  - Oil supply system on standby?
  - Dynalyne into standby?

Expected Result
All auxiliary systems are in the states suitable for daytime operations.

- The UMA is switched on.

Step 5 Description
TMA position in the morning

- Park the TMA in the position needed for the next day.

Expected Result
TMA parked in the corresponding position.

Step 6 Description

Expected Result

Step 7 Description
Night log

- Close the night log by writing a summary of the nightly events
- Send a link with the summary to the site manager.

Expected Result
The night log is closed.

5.7 Test Cycle LVV-C232

Open test cycle *TMA Pointing and Tracking - Analysis - In Depth* in Jira.

Test Cycle name: TMA Pointing and Tracking - Analysis - In Depth
Status: In Progress

Requirements verification for the pointing and tracking using the Star Tracker and the DIMM on a dedicated mounting plate connector to the top end of the TMA.

5.7.1 Software Version/Baseline

Star Tracker software version:
Dimm software version:
CSC software version:

Analysis software repository:

5.7.2 Configuration

Not provided.

5.7.3 Test Cases in LVV-C232 Test Cycle

5.7.3.1 LVV-T2738 - StarTracker Pointing and Tracking Test In-Depth Analysis, Pointing, Offset, Tracking Drift

Version **1**. Open *LVV-T2738* test case in Jira.

The objective of this test case is the **analysis of the data** taken to verify that the

- TMA achieves a pointing accuracy of 50 arcsec RMS relative to its own reference system for any motion within the pointing range.
- TMA achieves pointing repeatability within the value of 1arcsec RMS for any motion within the pointing range. (LTS-103-REQ-0011-V-01: 2.1.5_1)

NOTE: The Dome needs an offset of a min of 0.6 deg for the TMA motion during tracking, or else the Dome would need to be moved.

Preconditions:
At least one dataset for the forward or reverse, or random pointing pattern must be available.

Final comment:

Detailed steps :

Step 1	Description

Use the existing data to plot the tracking drift for the DIMM data in Az and El and calculate the resulting RMS.

mcs = Mount Control System
Plot:

- AZ_sky versus time
- EL_sky versus time
- AZ_mcs versus time
- EL_mcs versus time
- (AZ_sky - AZ_mcs) versus time
- (EL_sky - EL_mcs) versus time

Include the following information:

- Start and end AZ/EL as appropriate
- AZ/EL midpoint of time series as appropriate
- Start and end times

Expected Result

The RMS of the tracking drift is less than or equal to 1 arcsec.

Step 2 Description

If the plots show differences in Az and El, the following additional analysis shall be done:

1. Conduct a least-squares linear fit versus time.
2. Include uncertainty analysis of slope and y-intercept: Best-fit slope and y-intercept and their 1-sigma deviations
3. De-trend the difference data by the slope of the most likely linear fit.
4. Plot the marginal histogram of the de-trended difference data for AZ and EL.
5. Generate histogram plots for de-trended AZ_sky - AZ_mcs and EL_sky - EL_mcs.
6. Fit a model to the histogram (expectation is a simple gaussian or perhaps a double gaussian to capture wings of the distribution
7. Calculate histogram statistics - mean, mode STDev

Note:
MCS = Mount control system = measured AZ
Sky= calculated values taken from the astrometry.net solution

Expected Result

1. It is expected the tracking drift will be linear over the time baseline of the individual time series for each (Az, El) in the pointing grid.
   A higher-order model can also be used, but this will require follow-up investigations to understand why the drift is not linear.

Step 3 Description

Use the existing data to calculate the RMS for each measured position for each step, do the RMS for all steps, and calculate the error.

Expected Result

- The RMS of the position was calculated.
- The plots show the repeatability per pointing location. Each point was reached at least 5 times from a random 3.5 deg offset, and the corresponding plot shows a 5-point delta AZ vs. delta EL. Plot a circle for the expected value and one for the reached RMS.
- Choose different colors for going forward and backward through the pointings.

Step 4 Description

After all of the pointing locations have been reached 5 times:

- Plot the difference between the demand and measured position for El anf Az. (Delta EL vs Delta Az)
- Plot the in different colors the forward and backward moving.
- Plot the ring for expected RMS and measured RMS.
- Histogramm for delta Az, delta EL.
- fit the historgram with a gausian (nominal)
  - Fitted mean measures the accuracy
  - Fitted width to meet repeatability requirement.

Expected Result

All values are within 50 arcsec.

Step 5 Description

Verify the TMA north is in the general north direction.

Expected Result

The TMA's north is about 0deg in azimuth.

Step 6 Description

Take the data from the accelerometers and derive the acceleration and jerk values during the tests.

Test Data

Note: It is expected that the TMA operates outside of the maximum slewing rates. A deviation request may be required from UTE. However, the data from this test should show that the values are safe for the TMA and the requirement can be accepted as is.

Expected Result

The analysis shows the acceleration and jerk values are within the maximum slewing rates as defined in LTS-103 Section 2.2.2.1.

5.7.3.2 LVV-T2703 - TMA Tracking Jitter Validation - Data Analysis

Version **1**. Open *LVV-T2703* test case in Jira.

Analyze the data taken with the DIMM to characterize the TMA tracking Jitter.

Notes from the data acquisition:

- Using the DIMM. Tracking siderially is obligatory.
- Encoder stream at 50 Hz, Nyquist sampling at 100 -150 Hz.
- The standard frequency is 75Hz smaller frames allow for higher.
- StarTracker and DIMM are mounted and working at the same time.
- Observing strategy:

- Same observing pattern as the forward grid.
- The object is selected on the StarTracker.
- The offset to the DIMM is applied.
- DIMM streaming is used to confirm that the star is centered on the DIMM.
- This is done in parallel with the Slew and Settle data acquisition.

Preconditions:
Data for the Tracking Jitter are taken.

Final comment:

Detailed steps :

Step 1	Description

- Plot the Az and El vs time while the TMA was tracking.
- Calculate the RMS of the Tracking jitter.

Expected Result
The RMS of the tracking jitter in Az and El are within the allowed range.

5.7.3.3 LVV-T2749 - Slew and Settle analysis

Version **1**. Open *LVV-T2749* test case in Jira.

Analyze data to characterize the settling after a slew.

Preconditions:
Data were taken during observations for: LVV-T2732

Final comment:

Detailed steps :

Step 1	Description

Settling characterization:

1. Compute the star centroid from the Fast Camera data
2. Plot the star centroid vs. time
3. Fit a sin wave to the data
4. Determine the damping time

Test Data

Notes for the implementation:

- Generic Camera CSC does not do high-speed streaming
- Dave has a version of AVT streaming code that can stream to FITS files
- Dome-seeing monitor code does do the streaming and centroiding
- There maybe an issue with seeing injecting noise to the measurement
- DIMM can in principle save a stream as through VimbaView

Expected Result

1. Ringing during settlement should be at the 1st fundamental frequency of the mount at XXX Hz.
2. A decaying sin wave is observed.
3. The damp time is below XXX sec.

Step 2	Description

Accelerometer data analysis:

Analyze the accelerometer data:
Plot accelerations at EL close to the zenith and close to the Horizon.
AZ should be large.

Note:
Main concern is for a 3.5 degree offset.

Expected Result
The maximum acceleration and jerk at slew are within the requirement.

Slew and settle should be within the requirements.

5.8 Test Cycle LVV-C233

Open test cycle *TMA Pointing and Tracking - Part 3 - Tracking at Random Positions - 50" - StarTracker* in Jira.

Test Cycle name: TMA Pointing and Tracking - Part 3 - Tracking at Random Positions - 50" - StarTracker
Status: Not Executed

Requirements verification for the pointing and tracking using the Star Tracker and the DIMM on a dedicated mounting plate connector to the top end of the TMA.

5.8.1 Software Version/Baseline

Star Tracker software version:
Dimm software version:
CSC software version:
Analysis software repository:

5.8.2 Configuration

Not provided.

5.8.3 Test Cases in LVV-C233 Test Cycle

5.8.3.1 LVV-T2707 - Evening Summit Tailgate Meeting - TMA and Dome Testing Safety Assurance

Version **2**. Open *LVV-T2707* test case in Jira.

Ensure the safety of observation with the main telescope during nighttime operations.
Tailgate Meeting: Hold a tailgate for the upcoming task with personnel on the summit working during the night. Go over any relevant procedures, roles, and responsibilities.

Note: Version two is for tests that do not involve moving or opening the dome.

Preconditions:
All nonessential personnel has vacated the area.

Final comment:

Detailed steps :

Step 1	Description

Verify that there is unrestricted space for the TMA movement.

Expected Result

Step 2	Description

Expected Result

5.8.3.2 LVV-T2714 - Configure Observatory Environment for Nighttime Operations

Version **1**. Open *LVV-T2714* test case in Jira.

At the beginning of the night, prepare the observatory for nightly operations.

Preconditions:
Dome and the TMA, or at least the TMA must available for observations.

Final comment:

Detailed steps :

Step 1 Description
Telescope preparation:

- Remove the caps on top of the StarTracker telescopes and the DIMM.
- Check the instrument's health status by taking a test image.

Expected Result
The caps are removed.
The test image is taken and stored correspondingly.

Step 2 Description
Calibration images:
Not needed at the moment, to be included if data analysis reveals the need.

- Take 10 "darks" with the StarTracker and the DIMM instruments. Use the same exposure time as for the images.

- Take 10 “sky flats” with the StarTracker and the DIMM instruments.

Expected Result
The Darks and flats are stored in the expected location.

Step 3 Description
Auxillary systems nighttime preparations:

- Switch off the UMA in the afternoon.

Expected Result
The UMA is switched off.

Step 4 Description
Night logging page:
Start the night log similar to the AuxTel night log:

https://confluence.lsstcorp.org/display/LSSTCOM/Night+Logs

Expected Result
Page created with template information.

Step 5 Description
TMA preparation

- Check the Oil Supply System (OSS) on the EUI
- Follow the attached manual to startup the TMA.

Expected Result
The OSS is operational:

Step 6	Description

CSC activation:

Use L.O.V.E to bring the CSC to the enabled state.

Expected Result
All needed CSCs are in the enabled state.

5.8.3.3 LVV-T2740 - StarTracker Pointing and Tracking Test - Tracking at Random Positions

Version **1**. Open *LVV-T2740* test case in Jira.

Collect data with the StarTracker following the reverse azimuth pattern with respect to the forward Azimuth pattern (https://jira.lsstcorp.org/secure/Tests.jspa#/testCase/LVV-T2731)
The azimuth and elevation pattern here is randomized. The values used are coming from the pool of 270, 180, 90, 0, -90, -180, -270 deg Azimuth angles and 15, 45, 86,5 deg elevation angles. Optionally Azimuth angels at Elevation 75 can be added.

This test

- is foreseen the third of four tests
- takes about one summer night (7 hours) in the full version and a bit more than 5hours in the shortened version.

Preconditions:
TMA and Dome are controlable from the CSC.

Final comment:

Detailed steps :

Step 1 Description

Point the Dome:

Command the Dome to Pointing 1 to 270

Expected Result

The Dome starts moving.

Step 2 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 3 Description

Point the TMA

Command the TMA to Pointing 1 at 270 , 15 .

Expected Result

The TMA starts moving

Step 4 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 5 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 270, 15 .

Expected Result
TMA reaches the commanded position.

Step 6 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 7 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 8 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 9 Description
Point the Dome:
Command the Dome to Pointing 2 to -180

Expected Result

The Dome starts moving.

Step 10 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 11 Description

Point the TMA

Command the TMA to Pointing 2 at -180 , 45 .

Expected Result

The TMA starts moving

Step 12 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 13 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -180, 45 .

Expected Result

TMA reaches the commanded position.

Step 14 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 15 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 16 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 17 Description

Point the Dome:

Command the Dome to Pointing 4 to 90

Expected Result

The Dome starts moving.

Step 18 Description

Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 19 Description
Point the TMA
Command the TMA to Pointing 4 at 90 , 86.5 .

Expected Result
The TMA starts moving

Step 20 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 21 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 90, 86.5 .

Expected Result
TMA reaches the commanded position.

Step 22 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 23 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 24 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 25 Description

Point the Dome:

Command the Dome to Pointing 5 to -270

Expected Result

The Dome starts moving.

Step 26 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 27 Description

Point the TMA

Command the TMA to Pointing 5 at -270 , 15 .

Expected Result

The TMA starts moving

Step 28 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 29 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -270, 15 .

Expected Result

TMA reaches the commanded position.

Step 30 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 31 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 32 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 33 Description
Point the Dome:
Command the Dome to Pointing 7 to 180

Expected Result
The Dome starts moving.

Step 34 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 35 Description
Point the TMA
Command the TMA to Pointing 7 at 180 , 45 .

Expected Result
The TMA starts moving

Step 36 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 37 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 180, 45 .

Expected Result

TMA reaches the commanded position.

Step 38 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 39 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 40 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 41 Description

Point the Dome:

Command the Dome to Pointing 8 to 0

Expected Result

The Dome starts moving.

Step 42 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 43 Description

Point the TMA

Command the TMA to Pointing 8 at 0 , 86.5 .

Expected Result

The TMA starts moving

Step 44 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 45 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 0, 86.5 .

Expected Result

TMA reaches the commanded position.

Step 46 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 47 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 48 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 49 Description

Point the Dome:

Command the Dome to Pointing 9 to -90

Expected Result

The Dome starts moving.

Step 50 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 51 Description

Point the TMA

Command the TMA to Pointing 9 at -90 , 15 .

Expected Result

The TMA starts moving

Step 52 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 53 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -90, 15 .

Expected Result

TMA reaches the commanded position.

Step 54 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 55 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 56 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 57 Description

Point the Dome:

Command the Dome to Pointing 10 to 270

Expected Result

The Dome starts moving.

Step 58 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 59 Description

Point the TMA

Command the TMA to Pointing 10 at 270 , 45 .

Expected Result

The TMA starts moving

Step 60 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 61 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 270, 45 .

Expected Result

TMA reaches the commanded position.

Step 62 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 63 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 64 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 65 Description

Point the Dome:

Command the Dome to Pointing 12 to -180

Expected Result

The Dome starts moving.

Step 66 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 67 Description

Point the TMA

Command the TMA to Pointing 12 at -180 , 86.5 .

Expected Result

The TMA starts moving

Step 68 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 69 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -180, 86.5 .

Expected Result

TMA reaches the commanded position.

Step 70 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 71 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 72 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 73 Description

Point the Dome:

Command the Dome to Pointing 13 to 90

Expected Result

The Dome starts moving.

Step 74 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 75 Description

Point the TMA

Command the TMA to Pointing 13 at 90 , 45 .

Expected Result

The TMA starts moving

Step 76 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 77 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 90, 45 .

Expected Result
TMA reaches the commanded position.

Step 78 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 79 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 80 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 81 Description

Point the Dome:

Command the Dome to Pointing 15 to -270

Expected Result

The Dome starts moving.

Step 82 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 83 Description

Point the TMA

Command the TMA to Pointing 15 at -270 , 86.5 .

Expected Result

The TMA starts moving

Step 84 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 85 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -270, 86.5 .

Expected Result

TMA reaches the commanded position.

Step 86 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 87 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 88 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 89 Description

Point the Dome:

Command the Dome to Pointing 16 to 180

Expected Result

The Dome starts moving.

Step 90 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 91 Description

Point the TMA

Command the TMA to Pointing 16 at 180 , 45 .

Expected Result

The TMA starts moving

Step 92 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 93 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 180, 45 .

Expected Result

TMA reaches the commanded position.

Step 94 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 95 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 96 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 97 Description

Point the Dome:

Command the Dome to Pointing 17 to 0

Expected Result

The Dome starts moving.

Step 98 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 99 Description

Point the TMA

Command the TMA to Pointing 17 at 0 , 15 .

Expected Result

The TMA starts moving

Step 100 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 101 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 0, 15 .

Expected Result

TMA reaches the commanded position.

Step 102 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 103 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 104 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 105 Description
Point the Dome:
Command the Dome to Pointing 18 to -90

Expected Result
The Dome starts moving.

Step 106 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 107 Description
Point the TMA
Command the TMA to Pointing 18 at -90 , 86.5 .

Expected Result
The TMA starts moving

Step 108 Description
Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 109 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -90, 86.5 .

Expected Result

TMA reaches the commanded position.

Step 110 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 111 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 112 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 113 Description

Point the Dome:

Command the Dome to Pointing 20 to 270

Expected Result

The Dome starts moving.

Step 114 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 115 Description

Point the TMA

Command the TMA to Pointing 20 at 270 , 45 .

Expected Result

The TMA starts moving

Step 116 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 117 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 270, 45 .

Expected Result

TMA reaches the commanded position.

Step 118 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 119 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 120 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 121 Description

Point the Dome:

Command the Dome to Pointing 21 to -180

Expected Result
The Dome starts moving.

Step 122 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 123 Description
Point the TMA
Command the TMA to Pointing 21 at -180 , 15 .

Expected Result
The TMA starts moving

Step 124 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 125 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target -180, 15 .

Expected Result
TMA reaches the commanded position.

Step 126 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 127 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 128 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 129 Description

Point the Dome:

Command the Dome to Pointing 23 to 90

Expected Result

The Dome starts moving.

Step 130 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 131	Description

Point the TMA

Command the TMA to Pointing 23 at 90 , 15 .

Expected Result

The TMA starts moving

Step 132	Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 133	Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 90, 15 .

Expected Result

TMA reaches the commanded position.

Step 134	Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 135 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 136 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 137 Description

Point the Dome:

Command the Dome to Pointing 24 to -270

Expected Result

The Dome starts moving.

Step 138 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 139 Description

Point the TMA

Command the TMA to Pointing 24 at -270 , 45 .

Expected Result

The TMA starts moving

Step 140 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 141 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -270, 45 .

Expected Result

TMA reaches the commanded position.

Step 142 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 143 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 144 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 145 Description
Point the Dome:
Command the Dome to Pointing 25 to 180

Expected Result
The Dome starts moving.

Step 146 Description
Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 147 Description
Point the TMA
Command the TMA to Pointing 25 at 180 , 86.5 .

Expected Result
The TMA starts moving

Step 148 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 149 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 180, 86.5 .

Expected Result

TMA reaches the commanded position.

Step 150 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 151 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 152 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 153 Description

Point the Dome:

Command the Dome to Pointing 26 to 0

Expected Result

The Dome starts moving.

Step 154 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 155 Description

Point the TMA

Command the TMA to Pointing 26 at 0 , 45 .

Expected Result

The TMA starts moving

Step 156 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 157 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 0, 45 .

Expected Result

TMA reaches the commanded position.

Step 158 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 159 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 160 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 161 Description
Point the Dome:
Command the Dome to Pointing 28 to -90

Expected Result

The Dome starts moving.

Step 162 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 163 Description

Point the TMA

Command the TMA to Pointing 28 at -90 , 45 .

Expected Result

The TMA starts moving

Step 164 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 165 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -90, 45 .

Expected Result

TMA reaches the commanded position.

Step 166 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 167 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 168 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 169 Description

Point the Dome:

Command the Dome to Pointing 22 to 270

Expected Result

The Dome starts moving.

Step 170 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 171 Description

Point the TMA

Command the TMA to Pointing 22 at 270 , 75 .

Expected Result

The TMA starts moving

Step 172 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 173 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 270, 75 .

Expected Result

TMA reaches the commanded position.

Step 174 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 175 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 176 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 177 Description

Point the Dome:

Command the Dome to Pointing 23 to -180

Expected Result

The Dome starts moving.

Step 178 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 179 Description

Point the TMA

Command the TMA to Pointing 23 at -180 , 75 .

Expected Result

The TMA starts moving

Step 180 Description

Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 181 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target -180, 75 .

Expected Result
TMA reaches the commanded position.

Step 182 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 183 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 184 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 185 Description

Point the Dome:

Command the Dome to Pointing 24 to 90

Expected Result

The Dome starts moving.

Step 186 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 187 Description

Point the TMA

Command the TMA to Pointing 24 at 90 , 75 .

Expected Result

The TMA starts moving

Step 188 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 189 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target 90, 75 .

Expected Result
TMA reaches the commanded position.

Step 190 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 191 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result
RubinTV is showing an astrometric solution.

Step 192 Description
Offline analysis results
Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

Step 193 Description

Point the Dome:

Command the Dome to Pointing 25 to -270

Expected Result

The Dome starts moving.

Step 194 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 195 Description

Point the TMA

Command the TMA to Pointing 25 at -270 , 75 .

Expected Result

The TMA starts moving

Step 196 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 197 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -270, 75 .

Expected Result

TMA reaches the commanded position.

Step 198 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 199 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 200 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 201 Description

Point the Dome:

Command the Dome to Pointing 26 to 180

Expected Result

The Dome starts moving.

Step 202 Description

Wait for the Dome to reach the commanded position.

Expected Result
The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 203 Description
Point the TMA
Command the TMA to Pointing 26 at 180 , 75 .

Expected Result
The TMA starts moving

Step 204 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 205 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 180, 75 .

Expected Result
TMA reaches the commanded position.

Step 206 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 207 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 208 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 209 Description

Point the Dome:

Command the Dome to Pointing 27 to 0

Expected Result

The Dome starts moving.

Step 210 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 211 Description

Point the TMA

Command the TMA to Pointing 27 at 0 , 75 .

Expected Result
The TMA starts moving

Step 212 Description
Wait for the TMA to reach the commanded position.

Expected Result
The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 213 Description
Image preparation
If the preparation to take images takes longer than 10sec, do repositioning to target 0, 75 .

Expected Result
TMA reaches the commanded position.

Step 214 Description
Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 215 Description
On-the-fly Image Quality Check
While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 216 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result

Image quality is sufficient.

Step 217 Description

Point the Dome:

Command the Dome to Pointing 28 to -90

Expected Result

The Dome starts moving.

Step 218 Description

Wait for the Dome to reach the commanded position.

Expected Result

The *MTDome_logevent_azMotion* and *MTDome_logevent_elMotion* inPosition parameter = true.

Step 219 Description

Point the TMA

Command the TMA to Pointing 28 at -90 , 75 .

Expected Result

The TMA starts moving

Step 220 Description

Wait for the TMA to reach the commanded position.

Expected Result

The *MTMount_logevent_azimuthInPosition* and *MTMount_logevent_elevationInPosition* inPosition parameter = true.

Step 221 Description

Image preparation

If the preparation to take images takes longer than 10sec, do repositioning to target -90, 75 .

Expected Result

TMA reaches the commanded position.

Step 222 Description

Track position and take images

Take a StarTracker image with 10s exposure time.

If the time the available:

- Track a position for 10 min and take StarTracker images.

Expected Result

- If time is available: The TMA is tracking a given position for 10 min and taking images.
- At least one image is successfully taken with the StarTracker.

Step 223 Description

On-the-fly Image Quality Check

While tracking and taking images, check the images on RubinTV for an astrometric solution.

Expected Result

RubinTV is showing an astrometric solution.

Step 224 Description

Offline analysis results

Offline analysis in Test case LVV-T2739 Says that we do not have sufficient image quality.

Expected Result
Image quality is sufficient.

5.8.3.4 LVV-T2715 - Configure Observatory Environment for Daytime Operations

Version **1**. Open *LVV-T2715* test case in Jira.

After using the observatory during the nighttime, prepare the observatory for daytime operations.

Preconditions:
The observatory was used during nighttime.

Final comment:

Detailed steps :

Step 1	Description

CSCs

- Transition the CSCs into STANDBY state

Expected Result
All CSCs are in their standbyState.

Step 2	Description

Telescope daytime preparations:

- Switch off or bring into standby the StarTracker and DIMM instruments
- Install the caps on top of the StarTracker telescopes and the DIMM

Expected Result
The caps are installed.

Step 3 Description
Dome:

- Bring the dome into the park position

Until the dome shutter is motorized:

- Send a message to the site manager :
  - confirming that nightly operations have finished
  - asking for a dome closer before the sun starts to shine on the StarTracker and the DIMM.

Expected Result
Dome closure is organized.

Step 4 Description
Auxillary systems daytime preparations:
If needed for daytime operations:

- Switch on the UMA in the morning.
- When available and need to be modified for the day:
  - Oil supply system on standby?
  - Dynalyne into standby?

Expected Result
All auxiliary systems are in the states suitable for daytime operations.

- The UMA is switched on.

Step 5 Description

TMA position in the morning

- Park the TMA in the position needed for the next day.

Expected Result

TMA parked in the corresponding position.

Step 6 Description

Expected Result

Step 7 Description

Night log

- Close the night log by writing a summary of the nightly events
- Send a link with the summary to the site manager.

Expected Result

The night log is closed.

A Documentation

The verification process is defined in LSE-160. The use of Docsteady to format Jira information in various test and planing documents is described in DMTN-140 and practical commands are given in DMTN-178.

B Acronyms used in this document

Acronym	Description
CSC	Commandable SAL Component
ComCam	The commissioning camera is a single-raft, 9-CCD camera that will be installed in LSST during commissioning, before the final camera is ready.
DIMM	Differential Image Motion Monitor
DMTN	DM Technical Note
EFD	Engineering and Facility Database
EIE	European Industrial Engineering - Italian engineering company (Dome)
EUI	Engineering User Interface System
FITS	Flexible Image Transport System
FRACAS	Failure Reporting Analysis and Corrective Action System
FoV	Field of View (also denoted FOV)
GIS	Global Interlock System
IS	Interface Scientist
ISR	Instrument Signal Removal
IT	Information Technology
LFA	Large File Annex
LMC	Large Magellanic Cloud
LOTO	Lock Out Tag Out
LSE	LSST Systems Engineering (Document Handle)
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
LTS	LSST Telescope and Site (Document Handle)
LVV	LSST Verification and Validation
M1M3	Primary Mirror Tertiary Mirror
OSS	Observatory System Specifications; LSE-30

PMCS	Project Management Controls System
PPE	Personal Protection Equipment
RMS	Root-Mean-Square
SE	System Engineering
SITCOM	System Integration, Test and Commissioning
SMR	Spherical Mirror Retroreflectors
TBD	To Be Defined (Determined)
TCS	Telescope Control System
TEA	Top End Assembly
TMA	Telescope Mount Assembly
UMA	Air Improvement Unit (Spanish)
WCS	World Coordinate System