



Installation plan March 2014

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Change Record

Issue	Date	Section/ Paragraph Affected	Reasons / Remarks	Name
1.0	26.02.2014	all	created	M. Bonaglia

1 Scope

This document details the telescope activities involving the ARGOS systems scheduled for March 2014.

2 Applicable documents

No.	Title	Number & Issue
AD 1		
AD 2		

3 Personal Involved

INAF: Marco Bonaglia (MB), Lorenzo Busoni (LB), Tommaso Mazzoni (TM), Simone Esposito (SE)

AE: ARGOS engineer (Gustavo Rahmer, Michael Lefebvre)

MPE: Julian Ziegleder (JZ), Matthias Deysenroth (MD), ...

MPIA: Martin Kulas (MK), Jose Borelli (JB), Wolfgang Gaessler (WG)

CO: Crane Operator (... , LBTO)

TO: Telescope Operator (... , LBTO)

LBTO crew: ...

4 Daily activity resume

Tasks	Mon 10	Tue 11	Wed 12	Thu 13	Fri 14	Sat 15	Sun 16	Mon 17	Tue 18	Wed 19	Thu 20	Fri 21	Sat 22	Sun 23
On telescope electronic tasks														
LGSW installation in PEPSI lab														
LGSW functional check in PEPSI lab														
Setup LSP to LGSW racks connections, interfaces														
LGSW rack & cables installation														
LGSW to rack connections (electrical, coolin, air)														
LGSW installation on telescope														
Dichroic functionality test with ARGOS sw														
LGSW functionality tests on telescope														
On-sky sw setup and test (arbitrator, ARGOS loops)														
BCU test														
Calibration unit activity														
LAS functionality test														
24h system test (int. loops running)														
Test new telescope collimation tables														
PatCam IM recording														
Test ARGOS loops on-sky														

Monday March, 10th

The LGSW boxes are unpacked in the high bay and the needed LGSW parts are moved to the PEPSI lab.

REQUIREMENTS:

- **Though wheeled table** available in the High Bay area

#	Description	By	Area	Req
1.	Unpacking of LGSW box #3 (MISC): <ul style="list-style-type: none"> • Misc stuff (LGSW box #5): lifting stripes, eyebolts, etc... • LGSW lifting frame (to be assembled) • LGSW computer and rack supports • LGSW parts (LGSW box #1) • Cooling pipes (LGSW box #2) • Tool box 	INAF, CO, AE	High bay	Crane(or fork lift)
1.1.	Install LGSW computer in the ARGOS rack	MPIA, AE	Control room	
2.	Unpacking of LGSW box #2 (LGSW rack)	INAF, CO, AE, MPE	High bay	Crane
3.	Unpacking of LGSW box #1 (LGSW): <ul style="list-style-type: none"> • Hang lifting tool to crane • Lift LGSW flight case out of wooden box • Open flightcase and install eyebolts on LGSW • Lift LGSW out of the flightcase and secure it to wheeled table 	INAF, CO, AE	High bay	Crane

In addition to the LGSW unpacking we foresee a functionality test of the LAS in view of the night-time tests that can be carried out as soon as the required personnel is available on-site.

#	Description	By	Area	Req
1.	Update laser system software	MPIA	Control room	
2.	Functionality test of the laser system <ul style="list-style-type: none"> • Power up the system • Measure lasers output power, collimation, polarization, etc... • Warnings and emergency checks 	MPIA, MPE	Control room	

MPE crew will be involved in the C-ring rack cooler modification:

REQUIREMENTS:

- **Telescope pointed at horizon**

#	Description	By	Area	Req
1.	C-ring rack cooler modification	TO,CO, MPE	Inst. gallery	

Tuesday March, 11th

Cooling, air, Ethernet and power lines for operating the LGSW are setup in the PEPSI lab.

REQUIREMENTS:

- **Switch configured in the PEPSI lab**
- **Desktop computer in PEPSI lab (double monitor appreciated ☺)**

#	Description	By	Area	Req
1.	Cooling installation in the PEPSI lab: <ul style="list-style-type: none"> • Route cooling pipes to LGSW lab manifold: connect Swagelock, gold snake pipes and manifold • Connect cooling pipes on PC driver 	INAF, AE	PEPSI lab	
2.	Test cooling lines in short circuit	INAF, AE	PEPSI lab	
3.	Air circuit installation and test in PEPSI lab	INAF, AE	PEPSI lab	
4.	Move and setup LGSW in PEPSI lab: <ul style="list-style-type: none"> • Install PC driver on LGSW table • Install PatCam cooling • Check full cooling circuit functionality • Start fluxing air in LGSW • Route Ethernet cables between rack and devices • Route power/control devices cables • Install external THOR probes • Power cord 	INAF, AE	PEPSI lab	
5.	Check LGSW connectivity and in remote	INAF, AE, MPIA	PEPSI lab, Control room	

In parallel we request the LBTO crew to perform activities on telescope, DX side:

#	Description	By	Area	Req
1.	Dichroic and fold mirror covers removal	TO,CO	Inst. gallery	
2.	Telescope cooling manifold installation on LGSW table		Inst gallery	

Wednesday March, 12th

The whole day is dedicated to the functionality test of the LGSW in the PEPSI lab. The LGSW parts still in the High Bay are stored in the ARGOS cabinets and the area is cleared.

In parallel we foresee on telescope activity by the MPE crew to prepare the rack and LGSW installation and MPIA activity aimed to update the dichroic DX controller firmware to the latest version (tested in February run).

#	Description	By	Area	Req
1.	LGSW functionality test: <ul style="list-style-type: none"> • Powering on sequence • Shutdown sequence • Check alignment with internal source 	INAF, AE	PEPSI lab	
1.1.	Update firmware of the the DX dichroic controller (hosted in the LGSW rack).	MPIA	Control room	
1.2.	Rack interfaces installation on telescope	MPE, TO, CO	Instr. galley	
2.	Storage of unused LGSW parts in the ARGOS cabinets	INAF	3U	
2.1.	Setup LSP to LGSW rack connections on telescope: <ul style="list-style-type: none"> • Cable tray • 110V power line • Cooling lines (with junction below LGSW rack) • Ethernet cables (13) • Fast link fibers • Master clock cables 	MPE	Instr. gallery	
3.	Install and insulate PnCCD cooling lines	MPE	Instr. gallery	
4.	Install the mockup cable tray between the LGSW rack and table	MPE	Instr. gallery	

Thursady March, 13th

The goal for today is to install on telescope the rack, the cable tray to route the LGSW cables.

#	Description	By	Area	Req
1.	Power off and unplug all cables from rack	INAF, MPE, AE	PEPSI lab	
2.	Move rack to high bay	INAF, MPE, AE	High bay	
3.	Hang rack to crane, lift it to the dome through the hatch and install it on telescope	INAF, MPE, AE, CO, TO	Dome	Cran e
4.	Secure rack on LUCI platform	MPE, AE, LBTO	Instr. gallery	
4.1.	Transport cables, LGSW parts and securing material to instrument gallery	INAF	Instr. gallery	
5.	Setup LGSW lines between rack and table: <ul style="list-style-type: none"> • Cooling pipes: from T-junction below the rack to the manifold (insulation needed) • Air pipe • Ethernet cables • Power and control cables • THOR probes • Dichroic cables 	MPE, LBTO, INAF	Instr. gallery	
6.	Functional check of the connection lines installed	MPE, LBTO, INAF	Instr. gallery	

Friday March, 14th

The day is dedicated to install and check the LGSW functionality on telescope.

#	Description	By	Area	Req
1.	Move LGSW from PEPSI lab to high bay on the wheeled table	INAF, AE	High bay	
2.	Connect lifting eyebolts, hanling device to LGSW	INAF, AE, CO	High bay	Cran e
3.	Lift LGSW into dome through the hatch and install it on LGSW table	INAF, AE, TO, CO	dome	Cran e
4.	Secure LGSW on table	INAF, AE	Instr. gallery	
5.	Power on LGSW and check functionality	INAF, AE, MPIA	Control room	

Since the LGSW rack is installed and functional on telescope we foresee to test the functionality of the dichroic assembly with the ARGOS software as soon as the required personnel is available (in contingency for the whole 2nd week).

#	Description	By	Area	Req
1.	Check DX dichroic functionality with ARGOS software: <ul style="list-style-type: none"> • Functionality at different elevations • LUCI2 cal unit interlock 	MPIA, INAF	Control room	

Saturday March, 15th

Contingency for rack and LGSW installation

Sunday March, 16th

The day is dedicated to test the LGSW at different telescope conditions and to the functional parameters redefinition.

REQUIREMENTS:

- **Multiple variations in telescope elevation during test**

#	Description	By	Area	Req
1.	LGSW functionality test on telescope: <ul style="list-style-type: none">• Horizon• Zenith	INAF, AE, MPIA	Control room	
2.	LGSW functional parameters redefinition: tune temperature and humidity thresholds in SW and in Zabbix. Tune Zabbix triggers. (make sure that the system is safe and monitored)	INAF, AE, MPIA	Control room	
3.	LGSW test in the dome environment: cold start.	INAF, AE, MPIA	Control room	
4.	LGSW day-time check of alignment using LED sources mounted on the edge of the M2	INAF, AE, MPIA	Control room	

Monday March, 17th to Friday March, 21st

The second week is dedicated to implement and test some system-wide control loops and interactions between LGSW and LAS/LAN. Most of these activities require a working LGSW and LAS system (no-propagation). No major activity on the telescope is foreseen; as such auxiliary tasks like BCU tests and Calibration unit tests can be carried out as well.

We list hereafter the task to be accomplished before going on-sky on the 22nd.

List of software module to be tested in day-time. In daytime, with no laser propagation.

#	Description	By	Area	Req
1.	Acquisition of LGS with Patrol Cameras	INAF, AE, MPIA, MPE	Control room	
2.	LGS acquisition control matrix measurement			
3.	LGS drift offload from LGSW to LAS			
4.	LGS drift offload control matrix measurement			
5.	LGS spot size estimate and scan of spot size vs LAN lens position			
6.	Time of flight adjustment and scan of focus vs delay			

Since the LGSW is installed and functional on telescope we foresee to test the functionality of the fast link communication as soon as the required personnel is available (in contingency for the whole 2nd week).

#	Description	By	Area	Req
1.	BCU communication test LGSW to ASM. At the current status this requires to manually disconnect in the Treehouse the fiber from FLAO to ASM and connect the fiber from ARGOS to ASM. Test slope communication to ASM	INAF, AE, MPIA	Instr. gallery	Alfio remote
2.	BCU communication test PyrWFS to LGSW Connect FLAO output into ARGOS input. Test slopes communication	INAF, AE, MPIA	Instr. gallery	Alfio remote

If the other tasks are accomplished, some daytime could be spent in anticipating part of the work on the calibration unit foreseen for the 26-29th March. The goal is to have an early hint about CalUnit spot position on LGSW top

REQUIREMENTS:

- **Telescope pointed at horizon**

#	Description	By	Area	Req
1.	Preparation for calibration unit activity on 26-29 th March:	MPIA,	Telesco	Sciss



	<ul style="list-style-type: none">• drill holes/threading for new alignment screws for roll DX• same for SX (OPTIONAL)• new focusing screw DX• same for SX (OPTIONAL)• mount of CalUnit DX• adjust DX endstop	AE	pe	or lift
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REQUIREMENTS:

- **Telescope pointed at zenith and dark dome**

#	Description	By	Area	Req
2.	Test of CalUnit alignment	MPIA, TO	Control room	LUC I2 ready to use

Saturday March, 22nd and Sunday March, 23rd - Night time

The goal of the 2 nights for this run is to:

- verify the alignment of the dichroic and of the LGSW
- optimize time-of-flight and LAN focusing
- test the software of acquisition of the LGS beams
- test the LGS pointing offload
- collect system snapshots containing camera frames and slopes

As a baseline zenith pointing is sufficient. If possible, the LGS acquisition should be repeated at different elevation angles.

IMPORTANT NOTE: In preparation of the first ARGOS night it would be more effective to have access to the telescope for 2h during the previous week (starting from Sun 16th) to assess the most critical issues about alignment that could require major realignment of the LGSW and dichroic. The most critical tasks are task 1 and 2 of the table below.

#	Description	Req
1.	<p>On-sky check of telescope configuration with dichroic:</p> <ul style="list-style-type: none"> • Telescope setup without dichroic • Point at bright star • Collimate telescope with AGw • Reconfigure telescope with new config file • Slide in dichroic • Check that star position on AGw is unchanged <p>360deg rotation to check for pupil and field wobble. MBo initiated a discussion with JHill about this task. Estimated time 2h</p>	J. Hill
2.	<p>LGS acquisition on Patrol Camera (quick test).</p> <p>Goal is to manually adjust the LGS position within the LGSW Patrol Camera field until the 3 spots are centered in the LGSW FoV and light is propagated to the pnCCD. This should give a rough estimate of the alignment helping the ARGOS team in an early identification of alignment issues.</p> <p>To be done at zenith. Can this be done at late-afternoon, twilight? Estimated time 2h</p>	
3.	<p>On-sky measurement of LGS acquisition control matrix.</p> <ul style="list-style-type: none"> • The LGS are acquired on the Patrol Cameras, spots position are stored • A given LGS offsets (10'') is applied in the 2 direction and the new spots position are stored • The position offsets matrixes are inverted to create the control matrixes 	
4.	<p>On-sky measurement of LGS pointing offload control matrix.</p> <ul style="list-style-type: none"> • The LGS are acquired on the pnCCD, jitter loop is closed. • A given small LGS offsets (1'') is applied in the 2 direction and the new piezo mirror position are stored • The position offsets matrixes are inverted to create the control matrixes 	



5.	On-sky test of ARGOS loops: <ul style="list-style-type: none">• LGS acquisition with Patrol Cameras• LGS drift offload on pointing• Gating time optimization through overall LGS focus measure• LGS distance optimization through SH spots FWHM measure	
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