



ÖSTERREICHISCHES WELTRAUM FORUM
AUSTRIAN SPACE FORUM

AMADEE-24 EXPERIMENT PROCEDURE

A24-

Procedure MEROP - GOST

GENERAL INFORMATION

Principal Investigator	Rute Luz	
Author(s)	Rute Luz, Rui Abrantes, Ricardo Querido, Margarida Pereira, Gonalo Coelho, J�ssica Corujeira	
Version number	3.0	
Last edited on	1-March-2024	
Corresponding SEIF	File name	SEIF_MEROP_v2.5.pdf
	Version number	2.5
	Last edited on	14-Oct-2023

GOST PROCEDURES:

- *Prepare the SAMPLE rover for the experimental run* **A - SETUP SAMPLE SYSTEM FOR TELEOPERATION**
- *Execute the experimental run* **B - EXECUTE EXPERIMENTAL RUN**
- *Pack-up after experimental run* **C - PACK UP AFTER EXPERIMENTAL RUN**
- *Pack-up at the end of the mission* **D - FINAL MISSION PACK-UP**
 - **Note:** This should be executed before packing up the SAMPLE rover for shipping

SHORT EXPERIMENT DESCRIPTION:

Experiment Definition

The assigned GOST member should prepare the hardware and software outside the habitat to run the experimental run. Additionally, they should ensure robot safety during the experimental run by standing in line of sight to the rover during the run with an emergency stop.

Finally, the GOST should ensure a fully charged robotic system before experimental runs.

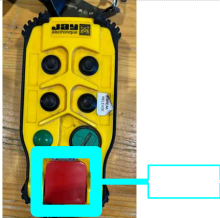
- All interactions, including turning ON the MEROP system onboard the rover, are executed using the laptop of the SAMPLE team.
- Necessary items for rover setup:
 - SAMPLE laptop
 - SAMPLE Procedures ("A24-08SMPL" file in the hive) referenced in MEROP procedures as **[A24-08SMPL]**:
 - I. Set-Up
 - J. Pre-Mission Checks
 - K. Emergency Stop
 - L. Software Start-Up
 - M. Preparation for MEROP
 - P. End of Mission
 - R. Restart Software

HARDWARE CHECKLIST

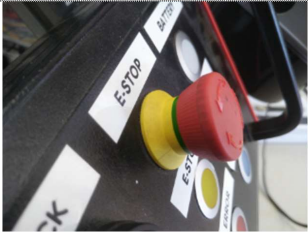
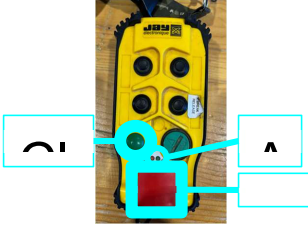
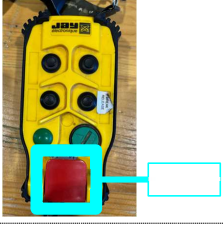
	PeliCase Containing:	
	GOST LAPTOP - This laptop will not be necessary for the MEROP setup, all onboard setups are executed by the SAMPLE laptop (outcome of the mission DR2) - you can use this laptop for other experiments or tasks during the mission	
	GOST laptop power brick	
	SSD (Mercator) - At the beginning of the mission this will be already installed inside the Mercator rover	
	Wifi Dongle (Mercator) - At the beginning of the mission this will be already installed inside the Mercator rover	

Procedures

A - SETUP SAMPLE SYSTEM FOR TELEOPERATION

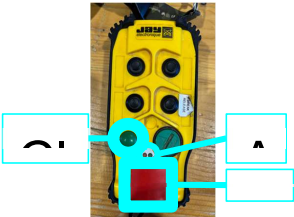
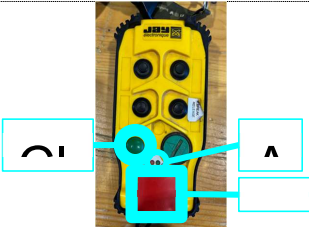
Step	Action	NOTES	Duration	Check
A.1.	If the SAMPLE rover is ON: - [A24-08SMPL] R. Restart Software	[A24-08SMPL] refers to the SAMPLE Procedure File	5 min	
A.2.	[A24-08SMPL] I. Set-Up		10 min	
A.3.	[A24-08SMPL] J. Pre-Mission Checks		10 min	
A.4.	[A24-08SMPL] L. Software Start-Up		5 min	
A.5	- [A24-08SMPL] M. Preparation for MEROP: - if in step [A24-08SMPL] M.8, you see "failed" on the terminal output, - use the command: "sudo systemctl stop merop.service" - Go to step [A24-08SMPL] M.7.		5 min	
A.6.	⬇ E-Stop button		1 s	
A.7.	Pick up the gamepad for the SAMPLE rover	 Turn On X-Box Controller by pressing the round button with the X-Box Logo on it for about 1s:	30 s	

Kommentiert [1]: we'll ask SAMPLE to update this in their procedures, but I'll leave this here just in case

				
		- light indicator should be ON		
A.8.	Release all four emergency buttons placed on each side of Mercator by rotating		10 s	
A.9.	Release the E-Stop (see image) Pull out red cap • Wait until only the 'Active' LED is on (right led/-green led) • Press clearance push button • One click-sound is coming from Mercator • And a short ringing sound will be played		10 s	
A.10.	✓ rover movement using the gamepad (forward and back movements): - if it fails: - [A24-08SMPL] R. Restart Software - redo steps from A.5	 ↓ deadman switch while moving the top left joystick	30 s	
A.11.	↓ E-stop button		1 s	

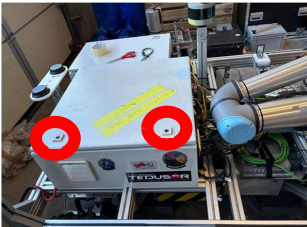
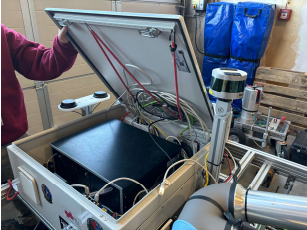
A.12	Go to B-EXECUTE EXPERIMENTAL RUN			
------	----------------------------------	--	--	--

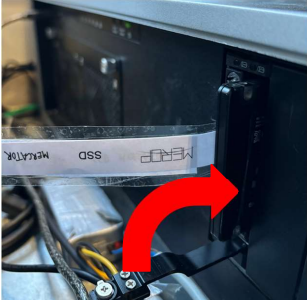
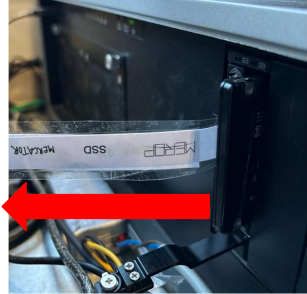
B - EXECUTE EXPERIMENTAL RUN

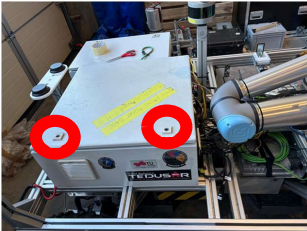
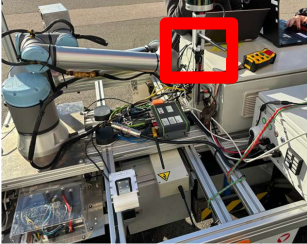
Step	Action	NOTES	Duration	Check
B.1.	✓ that Procedures A have been completed			
B.2.	Release E-Stop button: • Pull out red cap • Wait until only the 'Active' LED is on (right led/green led) • Press clearance push button (green button) • One click-sound is coming from Mercator • And a short ringing sound will be played		5 s	
B.3.	Manually drive the rover to the vicinity of the habitat with the gamepad		2-5 min	
B.4.	Inform the AAs: "The rover is ready to start the experimental run."		5 s	
B.5.	Wait for the AAs to inform you: "AA is ready to start MEROP experiment run"		1-10min	
B.6.	Release E-Stop button		5 s	
B.7.	Inform the AAs: "The rover is ready to start driving"	WARNING: Robot will start moving when remotely-operated from habitat	5 s	
B.8.	During the complete run: Follow the rover, and, in case of danger, ⚠ the remote E-Stop If the emergency button is pressed :	Dangerous situations: - collision with obstacles - nearby hole or crater - tip-over risk	~30 min	

Step	Action	NOTES	Duration	Check
C.3.	↓ E-Stop button		1s	
C.4.	Execute [A24-08SMPL] P. End Mission	Note: - this turns off the MEROP and SAMPLE systems, and leaves the robot charging	15 min	

D - FINAL MISSION PACK-UP

Step	Action	NOTES	Duration	Check
D.1.	Retrieve the SSD (Mercator) from the SAMPLE rover	1. open computer case by unlocking (using the key) the computer box:  key:  	5 min	

Step	Action	NOTES	Duration	Check
		2. Take out the labeled SSD (Mercator) from the computer slots 		

Step	Action	NOTES	Duration	Check
		3. Close the computer case and lock it with the key: 		
D.2.	Retrieve the <i>Wifi Dongle (Mercator)</i> from the SAMPLE rover	  - Remove the duct tape and disconnect from the USB port	5 min	
D.3.	Retrieve the GOST Laptop and <i>GOST Laptop Power Brick</i>		2 min	
D.4.	Place all the retrieved items (D.1-D.3) inside the <i>GOST Transportaion Case</i>		1 min	

Step	Action	NOTES	Duration	Check
D.5.	Close the top of the case and all the latches (image)		1 min	