

## ***Mission to Europa*** **Score Sheet**

School/Team: \_\_\_\_\_

Team captain: \_\_\_\_\_

Mission station officials: \_\_\_\_\_

### **5-Minute Set-Up and Safety Check**

- All power cords, power bars, pressurized cylinders, etc. are secured.
- A fuse is present in the vehicle's electrical system.
- No hazardous materials are leaking onto the pool deck.
- Vehicle is hand-launched by team members in a safe manner.
- No team member has entered the water in order to prepare and/or launch vehicle.
- Vehicle is in the water near the side of the control shack at the end of the 5-minute set-up period.

Mission official's notes: \_\_\_\_\_

- Team is ready for the mission:** \_\_\_\_\_ (official's initials)

*Note: An official's decision to disqualify a team due to safety concerns is final. If there is a safety concern, please contact the lead official or competition coordinator.*

### **Fuses**

If a team blows their 40-amp fuse, their mission performance period is over. The team will receive points for the mission tasks they have completed up to that point, but will not receive a time bonus score.

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### **Task #1 – Re-establish the communications link to the science package.**

#### **Scoring – 30 points**

\_\_\_\_\_ Descend through the hole with the cable & comms link – 5 points

\_\_\_\_\_ Locate & physically touch the open comms port on the science package – 5 points

\_\_\_\_\_ Successful link (a colored bulb lights topside) – 20 points\*

\*The link must be inserted into the comms port and released from the ROV in order to receive the full 20 points for a successful link. Partial points (5) are awarded for inserting the comms link into the port but not releasing the link. However, time bonus points will NOT be awarded for a partial link.

**Total Task 1 score:** \_\_\_\_\_

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**Task #2 – Retrieve data probes located within a drawer on the science package.**

**Scoring – 30 points**

- \_\_\_\_\_ Locate the data probe drawer on the science package – 5 points
- \_\_\_\_\_ Open the drawer – 10 points\*\*
- \_\_\_\_\_ Recover and return data probes to the surface – 5 points for each probe\*\*\*

\*\*The drawer must be opened so that the probes are exterior to the science package. A line clearly marked on the drawer will indicate this distance.

\*\*\*The probes must be recovered, returned to the surface, and retrieved from the ROV by a team member to be awarded the full 5 points per probe. Time bonus points will only be awarded if ALL 3 probes are recovered, returned, and retrieved.

**Total Task 2 score:** \_\_\_\_\_

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**Task #3 – Collect a sample of red fluid from the crevice.**

**Scoring – 30 points**

- \_\_\_\_\_ Locate the “crevice” filled with red fluid – 5 points
- \_\_\_\_\_ Up to 25 points for collecting a sample and returning it to surface
  - 401 – 500 ml 25 points
  - 301 – 400 ml 20 points
  - 201 – 300 ml 15 points
  - 101 – 200 ml 10 points
  - 0 – 100 ml 5 points

\_\_\_\_\_ Subtract 3 points for a diluted sample

**Total Task 3 score:** \_\_\_\_\_

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**Task #4 – Measure the temperature of the venting fluid.**

**Scoring – 30 points**

- \_\_\_\_\_ Locate the vent – 5 points
- \_\_\_\_\_ Up to 25 points for accuracy of the temperature reading
  - Temperature reading with 0.5°C of benchmark – 25 points
  - Temperature reading with 1.0°C of benchmark – 20 points
  - Temperature reading with 1.5°C of benchmark – 15 points
  - Temperature reading with 2.0°C of benchmark – 10 points
  - Temperature reading with 2.5°C of benchmark – 5 points
  - Temperature Reading more than 2.5°C off benchmark – 0 points

**Total Task 4 score:** \_\_\_\_\_

## TIME BONUS

**1 point for every minute & 0.01 point for every second under 30 minutes remaining**

For example, the duration of the mission is 25 minutes, 27 seconds. Minutes under 30 remaining = 4; seconds = 33. 4 minutes x 1 point = 4 points; 33 seconds x 0.01 points = 0.33. Therefore, the total time bonus = 4.33 points.

Duration of mission: \_\_\_\_\_

Minutes under 30 remaining: \_\_\_\_\_ x 1 point = \_\_\_\_\_

Seconds remaining \_\_\_\_\_ x 0.01 points = \_\_\_\_\_

**TIME BONUS:** \_\_\_\_\_

Note: The mission performance period ends when 1) the ROV has completed all 4 of the mission tasks; 2) the liquid sample has been returned to competition officials; 3) all 3 data probes have been delivered to competition officials; and 4) the ROV has returned to the surface through the hole in the ice.

The ROV does not need to return to the surface between tasks. Teams must leave enough time for competition officials to score the sample of red fluid. A sample returned after the 30 minute performance period is over will not be scored. The ROV does not have to stay on deck at the control shack while the officials score the sample.

The temperature measurement of the venting fluid must be shown to competition officials either on the ROV's video monitor or as a digital readout on the control panel within the 30 minute performance period. A temperature reading shown to officials after the 30 minute performance period is over will not be scored.

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## PENALTY POINTS

\_\_\_\_\_ Illegal pulling on tether (second infraction) – minus 5 points\*\*\*

\_\_\_\_\_ Illegal communication (second infraction) – minus 5 points

\_\_\_\_\_ Severing the communications probe cable – minus 5 points

\_\_\_\_\_ Minus 1 point per each additional minute above 5-minute demobilization period

\*\*\*Pulling on the tether to retrieve a disabled vehicle, including those disabled by a blown fuse, is an automatic penalty of 5 points.

**TOTAL PENALTY POINTS:** \_\_\_\_\_

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## SUMMARY

**TOTAL SCORE = TOTAL TASK SCORE + TIME BONUS – penalty points**

**Task #1 \_\_\_\_\_ + Task #2 \_\_\_\_\_ + Task #3 \_\_\_\_\_ + Task #4 \_\_\_\_\_ =**

**TOTAL TASK SCORE \_\_\_\_\_ + TIME BONUS \_\_\_\_\_ – penalty points \_\_\_\_\_ =**

**TOTAL MISSION SCORE \_\_\_\_\_**

**Mission official's initials: \_\_\_\_\_**

**Team captain's initials: \_\_\_\_\_**