MARINE IMAGING TECHNOLOGIES
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ROV Information Package

Updated: December 2, 2020

Introduction

This document contains information and general setup and operating procedures for ROV Ops using Pixel. It is intended for general information on how we typically deploy and as a basis for each group to ask questions and understand the operational needs for a small ROV deployment and to help facilitate a quick and efficient mobilization. The more we all understand the operational needs of each group, the better we can all plan.

Setup and procedures are adapted appropriately to vessel capabilities and mission requirements.

Typical ROV Schedule

Subject to change

0700 - 0800 Prep vehicle

0800 - Launch

1600- On Deck

1600 -1700 - Vehicle PostDive Maintenance

1800- Briefing/Debrief with ship, science and ROV team

1900 - Data Offload and Backups

Electrical Needs

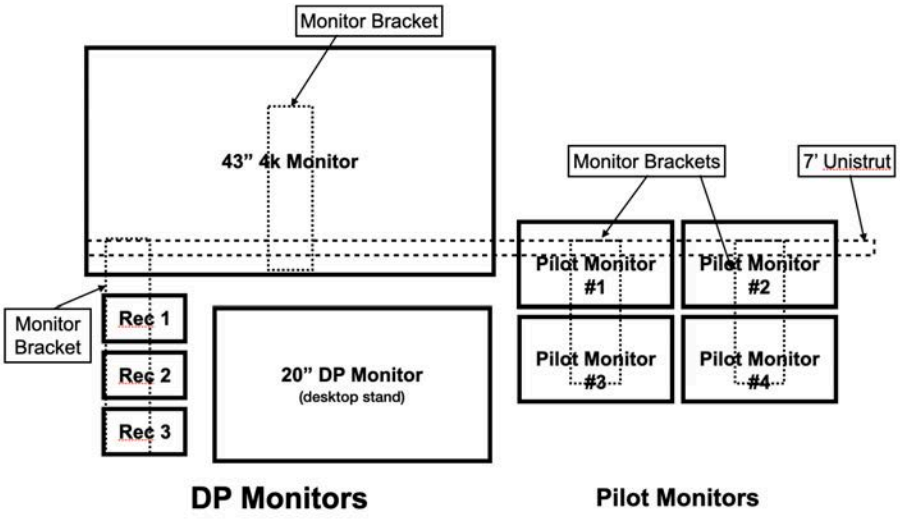
- **CLEAN POWER ONLY IF POSSIBLE**
- 220v, 30A minimum - ROV Control & ROV power - needed at control station
- 110v, 20A - Chandelier power - needed at control station
- 2 each 110v, 15-20A - Other Video and Data Equipment

Staff

- ROV Pilot
- Director of Photography
- Data Technician
- Deck Technician

Control Room Preferences

- Near the launch deck
- Windowless or darkened room
- 6’ table/bench with 2 chairs.
    - If ship provided, can we screw or attach into it?
- Power required/requested - **CLEAN POWER ONLY IF POSSIBLE**
    - 220v, 30A minimum - ROV Control & ROV power - needed at control station
    - 110v, 20A - Chandelier power - needed at control station
    - 2 each 110v, 15-20A - Other Video and Data Equipment
- Another 6’ table for data processing and backup
- Our equipment
    - 3 equipment racks (half racks)
    - Multiple laptops
    - Multiple monitors for pilot and camera op- See diagram



Typical Monitor Layout

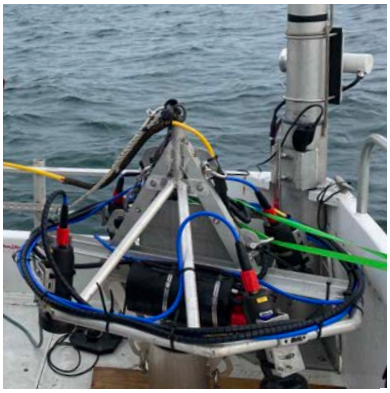
Deck Items

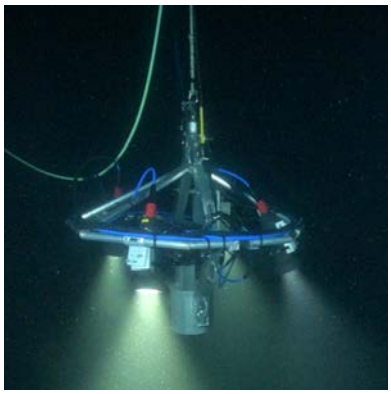
Item #1 - Pixel ROV

- First deployed, last retrieved
- 300 lbs
- 1 sq meter foot print
- When on deck, needs a two (2) point minimum tie down, preferably 4 points, Marine Imaging ratchet straps
- When on deck, needs 360* access with minimum 48” clearance.
- Pixel base will be emptied D Container

Item #2 - Chandelier/down weight

- Second deployed, first retrieved
- 250 lbs
- 1 sq meter foot print
- When on deck, can be strapped to gunwale or corner
- When on deck, need access to two adjacent sides





Deck Items Cont'd

Item #3 - ROV tether

- 1000'
- 100 lbs
- Green tether coiled into D Container with removable sides
- Always on deck
- 1m sq footprint
- Need access to 2 adjacent sides
- Stored on deck nearest to launch point
- Two (2) or four (4) point tie down
- **Need distance and route to Control Room**

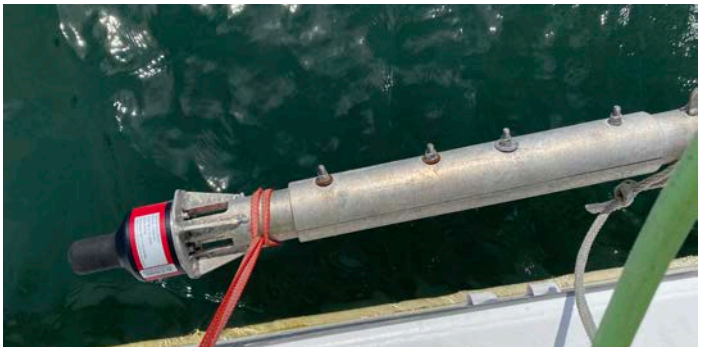
Item #4 - Chandelier tether

- 1000'
- 410 lbs
- 36" high
- Yellow tether on wheeled stainless winch spool
- Always on deck
- 1m sq footprint
- Stored on deck near other tether
- Need access to front only
- Two (2) or four (4) point tie down
- **Need distance and route to Control Room**

Deck Items Cont'd

Item #5 - USBL Pole

- Can be over the side or through moon pool
- Existing mounting bracket is clamshell clamp for 3" ID Sched 40 pipe with two (2) 3/8" hole on 6" centers
- Ship's pole?



Item #6 - Spares Container

- D Container with lid
- On deck in low traffic area - or in accessible storage area
- Need access to front only
- Two (2) or four (4) point tie down?

Item #7 - Tools Container

- D Container with lid
- On deck in low traffic area - or in accessible storage area
- Need access to front only
- Two (2) or four (4) point tie down?

Item #8 - Support Container

- D Container with lid
- On deck in low traffic area - or in accessible storage area
- Need access to front only
- Two (2) or four (4) point tie down?

Deployment and Recovery Procedure

A deployment and recovery plan will be provided for each day.

ROV operations related personnel will man stations 20-30 minutes prior to scheduled deployment recovery time.

Launch

- ROV Pre dives check 30 minutes prior to launch
- ROV lift line 15 minutes prior to launch
- Launch ROV

- Recover Lift line and Drive ROV away from vessel to predetermined distance (150’ - 250’ typical
- Attach chandelier to down line
    - Downline is either ship winch or line we bring that can be winched up on deck via ship winch/capstan
- Attach ROV tether to chandelier
- Lower chandelier - ROV descends with chandelier
- While lowering chandelier, hank both tethers onto down line using para-cord loops (2) with brass clip, approximately every 25’.
- Chandelier sits approximately 25-50’ above highest point of target

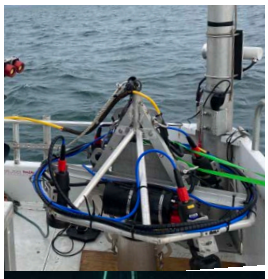
Recovery

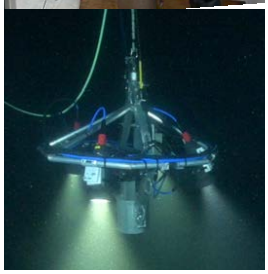
Recovery is essentially the reverse of Launch.

Operational Diagram

Strong Current

Not To Scale





Chandelier
150 - 250 lbs
6061 Aluminum

Chandelier Line

Chandelier Tether

ROV Tether

Ship's Line

Strong Current

Chandelier
Camera Bottle
Lighting Units
Lighting Power Bottle
USBL Beacon #2
Thrusters
Thruster Control Bottle

ROV

USBL Beacon #1

ROV Tether
60m - 70m from chandelier

Ship's Line

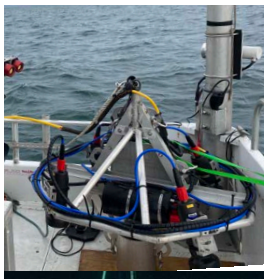
10m - 15m above highest point of target

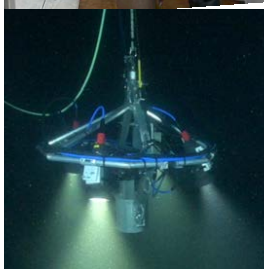
Swivel

Drop Weight
250 - 500 lbs
depending on current

TARGET

Mild Current
Not To Scale





Chandelier
150 - 250 lbs
6061 Aluminum

Chandelier Tether

ROV Tether

Ship's Line

Mild Current

Chandelier
Camera Bottle
Lighting Units
Lighting Power Bottle
USBL Beacon #2
Thrusters
Thruster Control Bottle

ROV

USBL Beacon #1

ROV Tether
60m - 70m from chandelier

10m - 15m above highest point of target

TARGET

Questions for ship

USBL

- Is there a moon pool or secured pipe over the side for mounting transducer?
- If ship does have an existing USBL pole can the bolt pattern be provided?

Control Room and Science Viewing

- Please provide size and layout of room with pictures if possible.
- Location preference is on main deck near launch area.
- What is the distance to launch area for cable runs and GPS Feeds?
- Are there benches or wall mount? Pictures available?
- Is there any Kendorf or Unistrut on wall for mounting?
- Are there video cables/fiber to the bridge for a USBL positioning feed?
- Is there a nearby area we can set up for general viewing?
- Does ship have a monitor we can provide feed to for general viewing?
- How do we communicate with bridge for moving ship during operations?
- How dark is room? Do we need to blackout windows?

Deck

- Does the ship have a crane, davit or a-frame? If so, what capacity?
- Can we use a ship winch for lowering weighted chandelier? (250lbs)
- The chandelier tether is on a small manually operated winch. What kind of mounting points/deck eyes are available for securing the winch?
- The ROV tether will be stored in and deployed from a D-container on deck. What kind of mounting points/deck eyes are available for securing to the deck?
- Is there a dry storage area for other D-containers?
- If currents are particularly challenging, we may forego the lighting chandelier and use a heavier clump weight. Can the ship provide a 300lb minimum plus weight?

Power

- Required Power listed earlier.
- Please provide pics of how we will tie into 220V? Plugs? Junction Box?

Safety Equipment

- What safety equipment is required while on deck?
- What safety equipment is provided?

General

- What are meal times?
- How much prep time to man stations in event of un-expected recovery?