

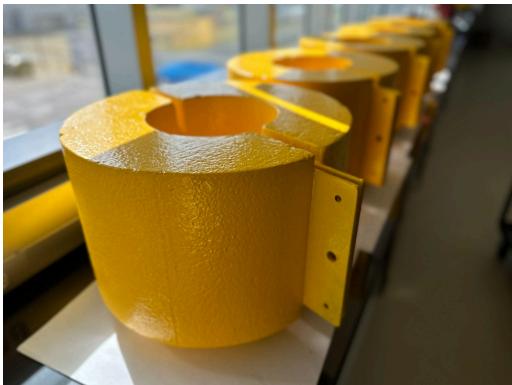
*PIFSC MAKER Lab Project # Mo8o: Design and Fabricate 10 Drifting Acoustic Spar Buoy Recorders (DASBR) for the Southwest Fisheries Science Center (SWFSC)*

# **Handoff Instructions: DASBR SWFSC**



Presented to Client: Shannon Rankin, SWFSC

Date: 05-07-2024



**Prepared by Project Manager: Risa Oram, PIFSC MAKER Lab**

Program Lead: Kevin Wong, PIFSC MAKER Lab

Project Team Members: Kyle Koyanagi, Jeremy Taylor, Chris Demarke, Jordan Romanelli and Erik Norris

# Cover Letter

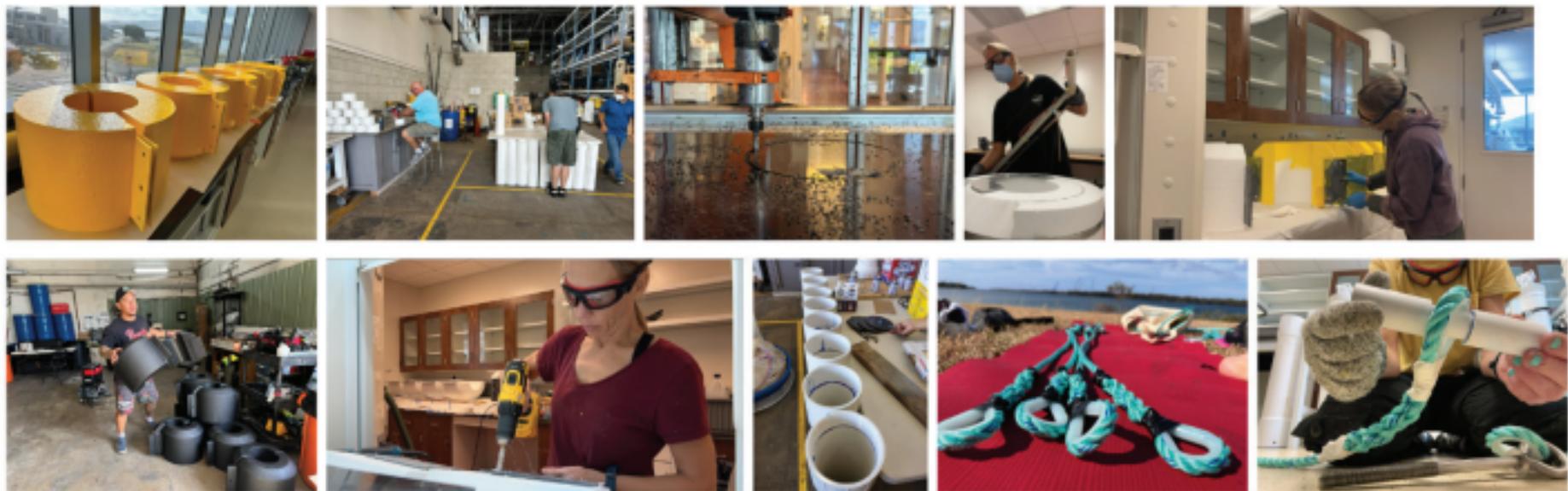
*Aloha Shannon,*

*I hope this shipment finds you well. Please let us know if you have any questions as you get started assembling your DASBRs. I've included a copy of a recent highlight we gave to our Director's Office. Thank you for the opportunity to work with you and please take good care of my DASBR babies! :)*

*Risa*



**MAKER Lab Highlight:** The MAKER Lab constructed 10 Drifting Acoustic Spar Buoy Recorders (DASBRs) and incorporated custom 3D-printed mounts for each buoys' dual Spot satellite transmitters. Most of the buoy subassemblies were fabricated in-house using conventional and advanced methods like CNC milling and 3D printing. The buoys' foam floats were sent to a local vendor for urethane spray coating to enhance durability and waterproofing. The DASBRs underwent water intrusion testing at the MARFAC, and then were packed up for shipment and delivery to the Southwest Fisheries Science Center (La Jolla, CA) who will be deploying them for cetacean research during the upcoming cruise season.



*Caption: MAKER Lab fabricating and packing DASBRs for shipment to SWFSC*

# Table of Contents

<b>Cover Letter.....</b>	<b>2</b>
<b>Table of Contents.....</b>	<b>3</b>
<b>Overview Whats in the Box? DASBR SWFSC.....</b>	<b>3</b>
Contents of Box 1 of 3:.....	3
Contents of Box 2 of 3:.....	4
Contents of Box 3 of 3:.....	4
<b>Box 1 Contents.....</b>	<b>4</b>
Foam Floats #1-5 with assembly plates.....	4
x5 Main Bodies.....	5
Not Pictured:.....	5
<b>Box 2 Contents.....</b>	<b>6</b>
Foam Floats #6-10 with assembly plates.....	6
x5 Main Bodies.....	6
Not Pictured:.....	6
<b>Box 3 Contents.....</b>	<b>7</b>
Primary Parts.....	7
Spare Parts.....	7
<b>Getting Started with Assembly.....</b>	<b>8</b>
For each DASBR you'll need these parts:.....	8
Tools required:.....	8
<b>Links.....</b>	<b>10</b>
1. STL files for 3D printing Spot Holders: DASBRs.....	10
a. Spot_battery_holder_v4.stl.....	10
b. Spot_bracket_v5.stl.....	10
c. Spot Holder Hardware:.....	10
2. 6in DASBR Construction & Assembly Manual 082520.pdf.....	10
3. Checklists: DASBR SWFSC_from PIFSC_J. McCullough v.4.30.2024.....	10

# Overview Whats in the Box? DASBR SWFSC

## **Contents of Box 1 of 3:**

- x5 Main bodies (PVC pipes and fittings)
- x10 DASBR floats halves (foam floats, numbered)
  - 01A, 01B, 02A, 02B, 03A, 03B, 04A, 04B, 05A, 05B
- x5 Hand Straps (Blue steel rope, plastic thimbles),
- x5 Spar Whips (Blue steel rope, plastic thimbles),
- x5 Eye Bolt Assemblies (Eyebolt, washers, and non-locking nut for shipping).

## **Contents of Box 2 of 3:**

- x5 Main bodies (PVC pipes and fittings)
- x10 DASBR floats halves (foam floats, numbered)
  - 06A, 06B, 07A, 07B, 08A, 08B, 09A, 09B, 10A, 10B
- x5 Hand Straps (Blue steel rope, plastic thimbles),
- x5 Spar Whips (Blue steel rope, plastic thimbles),
- x5 Eye Bolt Assemblies (Eyebolt, washers, and non-locking nut for shipping).

## **Contents of Box 3 of 3:**

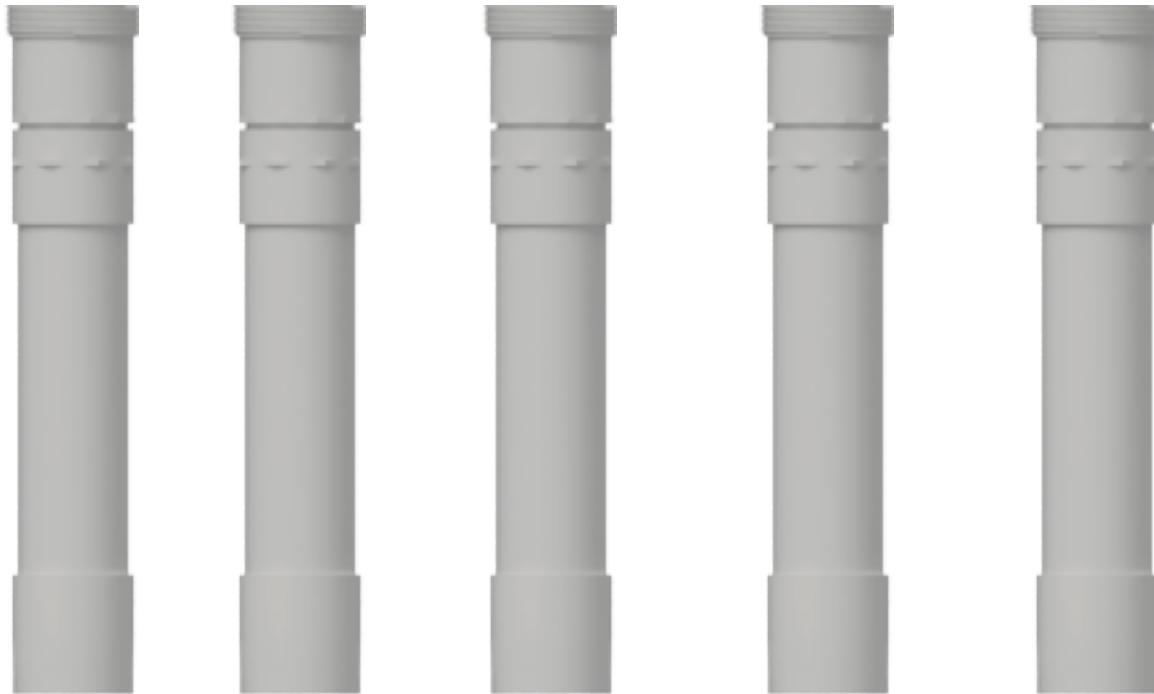
- x10 Head units (PVC fittings)
- x10 O-rings (rubber o-rings) to be used in head units.
- x11 Spot Transmitter Holders (3D printed plastic holder with metal fasteners packed in foam in a box).
  - x10 primaries
  - x1 spare
- x40 Bolt/ Washer/ Nut assemblies for foam floats (primary fasteners). Each assembly contains the following:
  - 1 bolt
  - 2 washers
  - 1 nut
- x10 Shackles (primary fasteners) for attaching hand strap to assembly plate on foam float)
- x1 Bag of desiccant pack
- X1 Boxes of assorted spare parts including:
  - X2 pipe wrenches
  - Pipe clamps
  - Fasteners (bolts, washers, lock nuts)
  - RectorSeal T Plus 2 in. 4 oz. Teflon Pipe-Thread Putty/Sealant Store SKU #676979 Model #23633
  - Permatex, 8 oz. Anti-Seize Lubricant

# Box 1 Contents



## Foam Floats #1-5 with assembly plates.

Foam pairs are marked with A & B (EPS foam coated with paint and polyurea and attached PVC sheets, resin rods).



## x5 Main Bodies

(PVC pipes and fittings, with PVC sheet bulkheads glued in)

## Not Pictured:

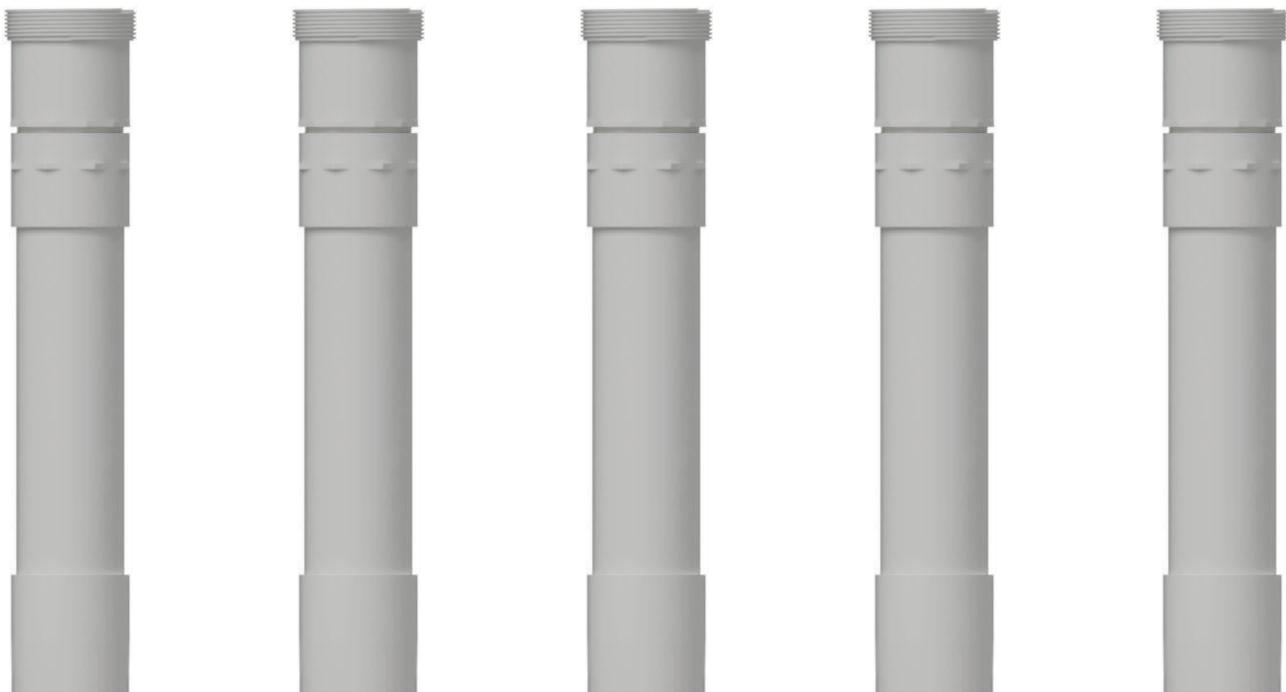
x5 Hand Straps (Blue steel rope, plastic thimbles),  
x5 Spar Whips (Blue steel rope, plastic thimbles),  
x5 Eye Bolt Assemblies (Eyebolt, washers, and non-locking nut for shipping).

# Box 2 Contents



## Foam Floats #6-10 with assembly plates.

Pairs are marked with A & B. (EPS foam coated with paint and polyurea and attached PVC sheets, resin rods).



## x5 Main Bodies

(PVC pipes and fittings, with PVC sheet bulkheads glued in)

## Not Pictured:

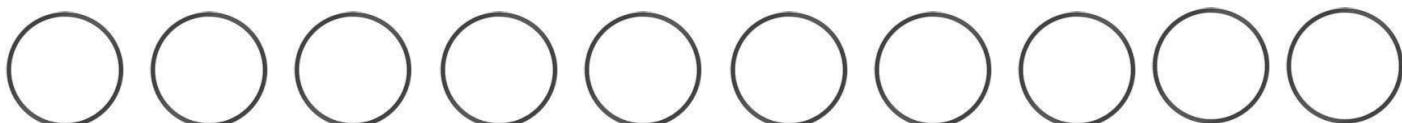
- x5 Hand Straps (Blue steel rope, plastic thimbles),
- x5 Spar Whips {Blue steel rope, plastic thimbles},
- x5 Eye Bolt Assemblies {Eyebolt, washers, and non-locking nut for shipping).

# Box 3 Contents



## Primary Parts

x10 Head Units



x10 O-Rings



x10 Spot Holders



x10 Spot Brackets



x40 Fastener Assemblies (each has x1 bolt, x2 washers, x1 locking nut)



x10 Shackles

## Spare Parts



x1 Spot Holder  
(Spare)



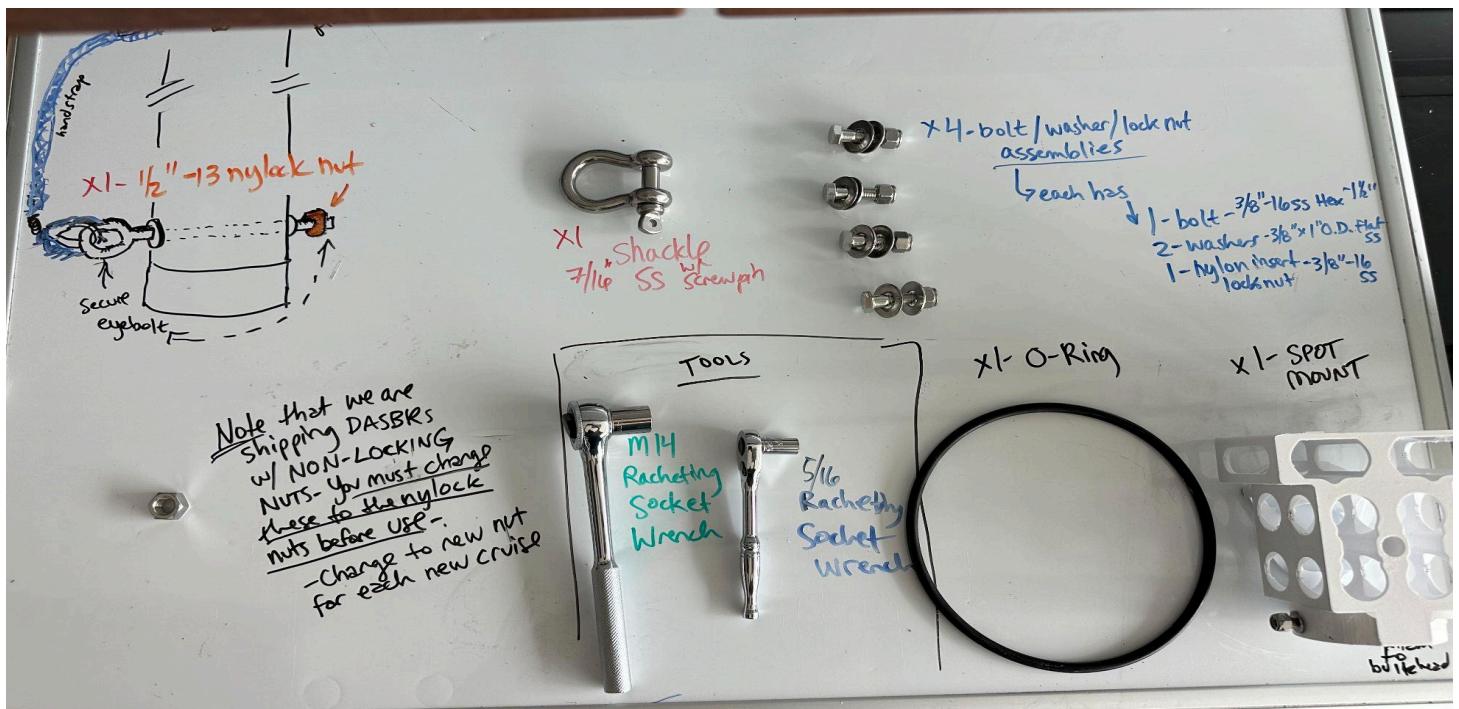
x1 Spot Bracket  
(Spare)

<box assorted spare parts>

- x1 bag of desiccant
- x2 pipe wrenches
- Pipe clamps
- Fasteners (bolts, washers, lock nuts)
- Teflon Pipe-Thread Putty/Sealant

- Anti-Seize Lubricant

# Getting Started with Assembly



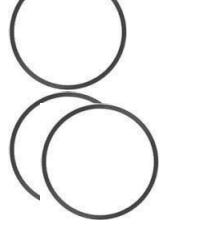
## For each DASBR you'll need these parts:

- x1 Nylock nut to secure eyebolt (shipped with non-locking nuts)
- x1 Shackle to attach hand strap to float
- x4 Bolt/ washer/ locknut fastener assemblies
- x 1 O-ring
- x1 Spot holder mount (connect to bulkhead)

## Tools required:

- M14 Racheting Socket Wrench
- 5/16 Racheting Socket Wrench
- M3 Hex driver (not shown)

**Steps to follow:**

1. Check hand strap, store straightened out.				 <i>Spar Whip</i>
2. Unpack Spar Whip; store straightened out. You may need to remove eye bolt to do this easily.				
3. Unpack the Spot Holders; inspect for damage from shipping.				
4. Unpack the o-rings; inspect for damage. Insert into union.				
5. Attach Spot holder to small pipe on bulkhead. Secure with fasteners. Place Spots inside.				

6. Use 3mm hex driver to open bracket to place batteries inside. Secure with fasteners.				
7. Secure cap on top.				
8. Match up float pairs and attach with fastener assemblies.				
9. Attach hand strap to hole on assembly plate of float using shackle.				
10. Tighten hose clamp (plastic encased metal clamp). Use small socket.				

# Links

## 1. STL files for 3D printing Spot Holders: DASBRs

### a. *Spot\_battery\_holder\_v4.stl*

- i. Link: [https://drive.google.com/file/d/1I-7oKFzGDW8MzfapNFHLzBbutliptUZz/view?usp=drive\\_link](https://drive.google.com/file/d/1I-7oKFzGDW8MzfapNFHLzBbutliptUZz/view?usp=drive_link)



ii.

### b. *Spot\_bracket\_v5.stl*

- i. Link: [https://drive.google.com/file/d/1PrFDImFpj1tGxshSuJ-WoGfF0xAFL6o/view?usp=drive\\_link](https://drive.google.com/file/d/1PrFDImFpj1tGxshSuJ-WoGfF0xAFL6o/view?usp=drive_link)



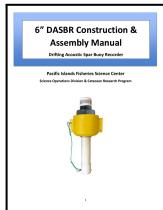
ii.

### c. *Spot Holder Hardware:*

Description	Vendor	Per Holder
Brass Heat-Set Inserts for Plastic - M3 x 4mm - Product ID: 4255	Adafruit	2
M3 x 14mm Socket Head Cap Screws Metric, Allen Socket Drive, Stainless Steel 304, Full Thread, Bright Finish, Machine Thread	various	2
Pan Phillips Machine 8-32 x 1-1/4"	various	1
Nylon Insert lock nut 8-32	various	1

## 2. 6in DASBR Construction & Assembly Manual 082520\_original.pdf

- a. Link: [https://drive.google.com/file/d/1Bz63\\_Gg139307GEDTM6dSzw-PjLGfhi/view?usp=drive\\_link](https://drive.google.com/file/d/1Bz63_Gg139307GEDTM6dSzw-PjLGfhi/view?usp=drive_link)



## 3. Checklists: DASBR SWFSC\_from PIFSC\_J. McCullough v.4.30.2024

- a. See the following link for checklists: Pre-Cruise Maintenance and Storage Checklist, Deployment Checklist, SoundTrap Setup Download Instructions DASBR, TDR Setup Download Instructions DASBR, DASBR Deployment and Retrieval Instructions, DASBR Deployment/Retrieval Instructions for Ship's officers, and Post-Cruise Maintenance and Storage.
- b. Link:  
[https://docs.google.com/document/d/1Y1yQOAnFIj\\_bLElgNnHO4hVX-OwJYrQvfklx\\_bI2As/edit?usp=sharing](https://docs.google.com/document/d/1Y1yQOAnFIj_bLElgNnHO4hVX-OwJYrQvfklx_bI2As/edit?usp=sharing)