

# Glider Prep and Deployment Checklists

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Glider - deployment <div style="border: 1px solid black; padding: 5px; display: inline-block;">                     RU41 - 20230420T1638                 </div>	Project <div style="border: 1px solid black; padding: 5px; display: inline-block;">                     RmI                      Seasonal 2023 Spring                 </div>
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Deployment dates <div style="border: 1px solid black; padding: 5px; display: inline-block;">                     4/20/23 - no end,                      lost at sea                      lost comms                      4/24/23                 </div>	Location/notes <div style="border: 1px solid black; padding: 5px; display: inline-block;">                     Coastal NJ                      glider lost at sea "                 </div>
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	Extant	Notes
1) Glider check-out sheet	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2) Ballasting/dunk sheets	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3) Deployment checklists (on boat, shore side)	<input type="checkbox"/>	<input type="checkbox"/>
4) Glider check-in sheet	<input type="checkbox"/>	<input checked="" type="checkbox"/> lost at sea
<hr/>		
5) Misc. (science, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/> CTD <input checked="" type="checkbox"/> Optode <input checked="" type="checkbox"/> <del>N/A</del> LISST	
6) Other	<input checked="" type="checkbox"/> compass	<input type="checkbox"/>

*pump might only be ± 400cc!!!*  
*UART checked [PUMP NOISE 000 Teib?]*

GLIDER	R041 R041
PREPARER	Brain
PREP DATE	04/11/23
LOCATION / MISSION	<del>near</del> RMI Spring
DENSITY @ TEMP	
INSURED?	yes

SCIENCE BAY SERIAL NUMBERS	Calibration Date (user/factory)	
	1) 9827 CTD	7/1/22
	2) Dmon 054 / 0223231F	—
	3) AX LIVE 457137	—
	4) Androm optode s/n 1036	6/15/22 / in-house 4/17/23
	5) Eucpuck 7660FLBBD0	7/14/22
	6)	

**PRE-SEAL** TAKE PICTURES OF CONNECTORS AT EACH SEALING JOINT

**FORE CHECK**

Check pump & pitch threaded rods (clean and grease)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Leak detect in place, batteries secure, grab & wiggle pitch battery to check secure, white guides free, no metal shavings, bottles installed	<input checked="" type="checkbox"/>
Grounded nose?	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		
Dessicant Exposed?	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		

**PAYLOAD CHECK**

Special Sensors / Additional Sensors?	Dmon, Axlive	CTD cable clear, no leak at CTD joint, no leak at pucks	<input checked="" type="checkbox"/>
Grounded?	Fore Sci Ring	CTD	<input checked="" type="checkbox"/>
Corrosion?	Aft Sci Ring	Other?	<input checked="" type="checkbox"/>

**AFT CHECK**

Iridium Card Installed (SIM #) (if not standard)	89881 6923400344 6796	<input checked="" type="checkbox"/>
Flash Card Check (remove old files, backed up? See <b>Software</b> section)		<input checked="" type="checkbox"/>
Inspect strain on connectors/worn connectors		<input checked="" type="checkbox"/>
Battery secured		<input checked="" type="checkbox"/>
Ballast bottle present		<input checked="" type="checkbox"/>
Aft cap clean/clear of leak		<input checked="" type="checkbox"/>
Ejection weight stem grounded? Should it be? (Version specific)		<input checked="" type="checkbox"/>
Thruster greased?		<input checked="" type="checkbox"/>

**Ensure safety of ballast pump prior to powering glider**  
 Battery check: G2/G1 turn glider on with only 1 battery connected; G3 use BMS current

Aft Pack Voltage	
Pitch Pack Voltage	
Nose Packs Voltage	
Emer (if possible) Voltage	
Cabling/connectors - lithium vs. alkaline circuit correct?	

*try 2*  

27mA	P112mA (wiggle)
54mA	A111mA
12.61V	

**POST-SEAL, pre-ballast**

**GENERAL**

Pick Point Present?	<input checked="" type="checkbox"/>	Special Cargo?	<input checked="" type="checkbox"/>
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**HARDWARE**

Nose cone and pump bladder inspection	<input checked="" type="checkbox"/> bladder fine	Anode size / remainder	40g
Anode grounded?	<input checked="" type="checkbox"/>	Payload sensor	1.8
Pressure Sensor Check (corrosion, clear)	<input checked="" type="checkbox"/>		
Aft sensor	<input checked="" type="checkbox"/>		
Ejection weight assembly ok/not seized?	<input checked="" type="checkbox"/>		

**POWERED**

log file: 6031.0000

- Put m\_coulomb\_amphr\_total accordingly ( 0 = new batteries)
- Put f\_coulomb\_battery\_capacity (Alk=155, Lilon=225, li=450,625)
- Vacuum @ T @ ballast ~~normal~~ ~~proceed~~ Stabilized m\_battery
- Get m\_tot\_num\_inflections. Verify relative < 20000 or sufficient
- Get m\_leakdetect\_voltage, science, forward (>2.3)
- Get m\_digifin\_leakdetect\_reading (less than 1019 requires service)
- Altimeter test - put c\_alt\_time 0, verify chirp, note m\_altimeter\_voltage
- Verify Argos ping
- Wiggle for 5 minutes

225

68

1022

6.1055 cell ✓

26.218 °C

-0.218 cc

0.0144 in

**SOFTWARE**

(paths are RU specific)

**GENERAL**

- Backup Glider and Science Cards ✓
- COOL/gliderData/glider\_OS\_backups/"glider name" ✓
- Format both CF cards - FAT Format ✓
- Apply new copy of latest TWR Software Image
- For Glider: COOL/gliderData/gliderDos\_releases/archived/"version"/target-glider
- For Science: COOL/gliderData/gliderDos\_releases/archived/"version"/target-science

✓

✓

- Copy/overwrite STATE and CONFIG Folders
- FW Transfer latest RU Software Image

COOL/Glidern/Glider Software Image/"use most recent image"

- Software Version 10.08
- Date OK? \_\_\_\_\_
- Configure TBDlist
- Configure NBDlist

**\CONFIG**

simul.sim deleted

**\MAFILES**

- goto\_110.ma (set x\_last...)
- yo\*.ma, surfac\*.ma pertinent for each glider and test missions

**MISSIONS**

- b\_arg: undervolts: 10.75V alkaline, 9-10 V Li3S, 13.5V Li4S, 12.75V Lilon
- Remove unused sample behaviors in missions

**AUTOEXEC.MI**

- Iridium: Numbers may vary. Listed: Main - Rutgers Alternate - TWR
- Irid Main: 88160000592 \_\_\_\_\_ Irid Alt: 17818711614 \_\_\_\_\_
- u\_iridium\_failover\_retries = 10 \_\_\_\_\_ u\_sequence\_start\_delay 240 \_\_\_\_\_
- sci timestamp sensors (ctd41cp) \_\_\_\_\_ Calibration coefficients \_\_\_\_\_
- Reset the glider, observe any errors
- get f\_max\_working\_depth \_\_\_\_\_

**CACHE MANAGEMENT**

- del ..\state\cache\\*.\*
- after \*bdlist.dat are set (exit reset):
- logging on; logging off
- send ..\state\cache\\*.cac
- send \*.mbd \*.sbd \*.tbd

**DOCKSERVER**

- Version \_\_\_\_\_
- Check script \_\_\_\_\_

**TWR BACKUP**

- Confirm to-glider folder clear \_\_\_\_\_
- Confirm correct script running \_\_\_\_\_

\* Software Burning Tips : if using Procomm or local folder, copy all the files from the software image locally. Then proceed to edit them for the glider and do a mass freewave transfer of the files. Save these files or prepare the to-glider with these files













GLIDER: 2041

Iteration 1 Log File 0022.0000 Date / Location Brook March 24, 2023

				Ballast	Notes
FORE	EB	SB	AFT	FBB1 stbd	
Front Scale		Aft Scale		FBB2 Port	
<u>114</u>		<u>86</u>		Aft BB	
Instrument: _____		Instrument: <u>2041</u>		Roll <u>-0.00174 rad</u>	
T = _____	T = <u>22.5256</u>			Ballast <u>-0.1184 cc</u>	
C = _____	C = <u>4.28077</u>			Battery <u>0.013106 in</u>	
D = _____	D = _____				

Iteration 1.1 Log File 0022.0000 Date / Location Brook March 24<sup>th</sup>, 2023

				Ballast	Notes
FORE	EB	SB	AFT	FBB1 stbd	
Front Scale		Aft Scale		FBB2 Port	
<u>242</u>		<u>152</u>		Aft BB	
Instrument: <u>42</u>		Instrument: _____		Roll _____	
T = _____	T = _____			Ballast <u>533.98 cc</u>	
C = _____	C = _____			Battery <u>0.0224 in</u>	
D = _____	D = _____				

*red circle* nut

*Pump all the way out*

*red circle = 494*

*nut = 110 g*

Iteration 1.2 Log File 0022.0000 Date / Location Brook March 24<sup>th</sup>, 2023

				Ballast	Notes
FORE	EB	SB	AFT	FBB1 stbd	
Front Scale		Aft Scale		FBB2 Port	
<u>486</u>		<u>122</u>		Aft BB	
Instrument: _____		Instrument: _____		Roll _____	
T = _____	T = _____			Ballast <u>-534.218 cc</u>	
C = _____	C = _____			Battery <u>0.0211 in</u>	
D = _____	D = _____				



new water  
 cond: 4.3366  
 temp: 22.6562  
 dens:

GLIDER: ~~RC41~~ RC41

Iteration 2 Log File 0026.0000 Date / Location Rucool 4/6/2023 BMI Spring

FORE	EB	SB	AFT
Front Scale			Aft Scale
<u>110</u>			<u>144</u>
Instrument: <u>RC41</u>			Instrument: <u>1581</u>
T = <u>23.2898</u>			T = <u>23.2929</u>
C = <u>4.4563</u>			C = <u>4.4556</u>
D = <u>          </u>			D = <u>1019.98</u>

Ballast  
 FBB1 stbd 212g  
 FBB2 Port             
 Aft BB 8 + 225  
 Roll 0.04188  
 Ballast -0.1184  
 Battery 0.01176

Notes  

F	A	$\frac{114-86}{2} = 28$
114	86	
-28	+28	spreadsheet
+37	+37	same to add
+9	+65	74g
		$\frac{74}{2} = 37$

$\Delta t = 0.003$   $\Delta c = 0.0007$

\* glider is ballasted, but bars in the pitch need to be added

H-moment: log file: 0027.0000  
 scale w/ weight: 522g weight add: 294g  
 roll w/ weight: 0.4031

Iteration 3 Log File 0028.0000 Date / Location Rucool 4/11/2023

FORE	EB	SB	AFT
Front Scale			Aft Scale
<u>96</u>			<u>62</u>
Instrument: <u>RC41</u>			Instrument: <u>          </u>
T = <u>22.1362</u>			T = <u>          </u>
C = <u>4.3300</u>			C = <u>          </u>
D = <u>1028.24</u>			D = <u>          </u>

Ballast  
 FBB1 stbd             
 FBB2 Port             
 Aft BB             
 Roll 0.16929  
 Ballast -0.1184 cc  
 Battery 0.0117 in

Notes - added weights to pitch ladders & adjusted round glider  
 h-moment  
 scale w/ weight: 460g  
 roll: 0.46076 rad  
 mass: 294g

Iteration 4 Log File 0029.0000 Date / Location Rucool 4/11/2023

FORE	EB	SB	AFT
Front Scale			Aft Scale
<u>112</u>			<u>108</u>
Instrument: <u>RC41</u>			Instrument: <u>1581</u>
T = <u>21.9168</u>			T = <u>21.9185</u>
C = <u>4.3094</u>			C = <u>4.3126</u>
D = <u>          </u>			D = <u>1020.251</u>

Ballast  
 FBB1 stbd             
 FBB2 Port             
 Aft BB             
 Roll 0.03141 rad  
 Ballast -0.1184 cc  
 Battery 0.0198 in

Notes H-moment  
 mass: 294  
 roll: 0.31939 / scale: 516

Rechargeable batteries adding weight

~ 720 grams

- bar weight w/ screws in pump: 498 grams
  - weight left to be removed:  $720 - 498 = 222 \text{ g}$ 
    - 6H food stb: 212 grams
- $222 - 212 = 10 \text{ grams left to remove (maybe w/in tolerance?)}$

other scenario: 90% food 10% aft

~~720~~  $720 \times .9 = 648 \text{ g food}$

$720 \times .1 = 72 \text{ g aft}$

pump

bar 2  
 $648 - 498 = 150 \text{ g left}$

150 g → remove from food stb 6H

Aft

- remove 72 grams from aft 6H w/ 225 grams

$225 \text{ g} - 72 \text{ g} = 153 \text{ grams left in aft 6H}$

summary

remove <sup>1</sup>/<sub>v</sub> bar weight ↓ 150 grams from pump

remove 72 grams from aft

\* ~~the~~ example for the actual weights that will be removed

every 6.5"

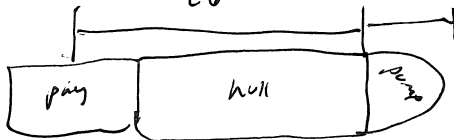
10% decrease in  
pressure  
to front

starting from  
Sea in pump

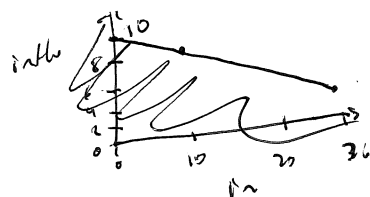
math exercise

26" from midline to pump seal

5" 26" 10" 5" 10"



W/P



$\frac{11\frac{1}{2}}{6.5} = 1.76$   
6.5 1.75 ~

W/P

$\approx 17.5 \sim$   
100%

$90 - 17.5$

$10 + 17.5$

$72.5 \%$

$27.5 \%$

04/07/2023 - b.budington

need to add 2 bars to the pitch battery (is a new rechargeable)

found a reference bar in the lab, weighs 360 g.  $360 \times 2 = 720$

720 grams will have to be removed from the pump.

- one bar weight w/ screws = 498 g



3/28/2023

RU41 - full glide weight OHAUS: 64.5 kg  
(1002)

### Simulation:

software image ✓

- Made tblist higher res to try to get larger files.
- will need to adjust as needed to get ~30kb files.

Need  
simul.sim

S-water-depth<sup>as</sup> 1000

S-ini-lat

S-ini-lon

Two aft bottles?  
get rid of core on tail?

Currently at 1023.3 according to Brian's data

To get to 1024.5  
add 73.2g

To get to 1024.75, add 57.5g

To get to 1024, add 41.7g

### Dmon: using instructions

software was already on computer, but went thru zadyg stuff again anyways bk wasn't sure if it had been done yet.

connected via cable, launch d3host - connected first try

Battery @ 54.770

did not change firmware

g to quit; no dev run immediately

admission sci-on.mi

logging on 00230000

dmon-msg-byte increasing

created @ Vern and asc file.

WC281833

04/06/23 b. buckingham  
 spare bottles (aft stb & fwd port  
 btl) pre-weights (came in box  
 w/ shipment  
 aft btl: 159g  
 fwd port btl: 125g  
 adding desiccant - 65 grams

Glider / Mission: RU41 / RMI

Cal Location DMCS Gantry

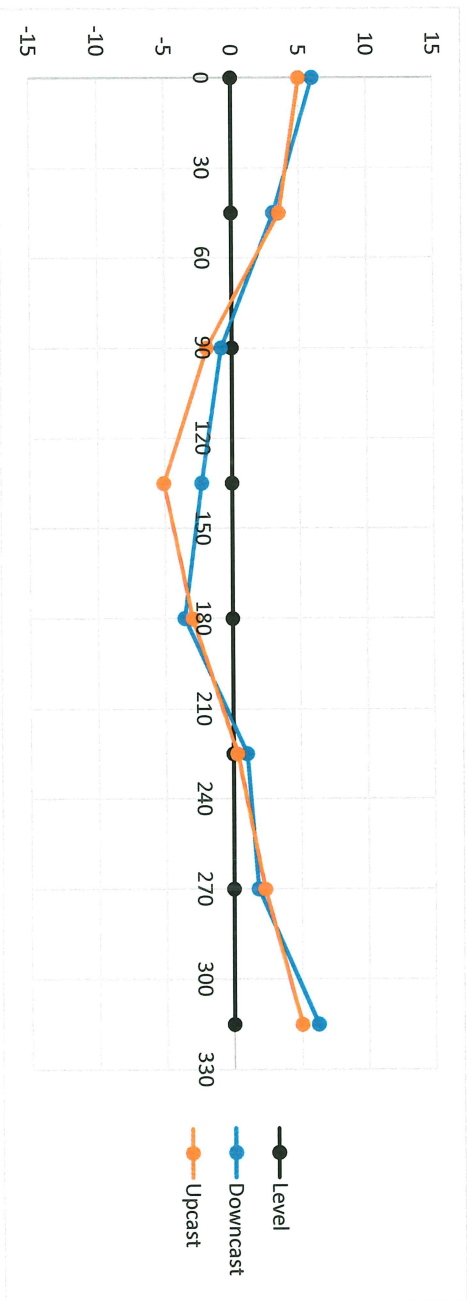
Date 4/19/2023

Operator Nicole, David, Kaycee

	LEVEL		ERROR
	HAND	GLIDER	
0			0
45			0
90			0
135			0
180			0
225			0
270			0
315			0

	DOWNCAST		ERROR
	HAND	GLIDER	
0	13	19	6
45	54.5	57.6	3.1
90	96	95.2	-0.8
135	129	126.7	-2.3
180	176	172.4	-3.6
225	228	229	1
270	275	276.8	1.8
315	319.5	325.7	6.2

	UPCAST		ERROR
	HAND	GLIDER	
0	3	8	5
45	44.5	48	3.5
90	95	93.1	-1.9
135	139.5	134.4	-5.1
180	186.5	183.5	-3
225	228	228.3	0.3
270	279	281.3	2.3
315	318	323	5



## Slocum CTD Comparison Check

GLIDER: RU41 SB: 9827p DEPLOYMENT: RMI 2023 Spring

### Pre-Deployment

Date: 4/11/23

SBE19 s/n: 1581	Glider:
Temperature: 21.9185	Temperature: 21.9168
Conductivity: <del>4.3094</del> 4.3126	Conductivity: 4.3094

Notes:

### Post-Deployment

Date: \_\_\_\_\_

SBE19 s/n:	Glider:
Temperature:	Temperature:
Conductivity:	Conductivity:

Notes:

\*\*\* CTD Maintenance if comparison is not acceptable (reference SeaBird Application Note 2D)

1. Perform CTD backward/forward flush with 1% Triton X-100 solution
2. Perform CTD backward/forward flush with 500 – 1000 ppm bleach solution
3. Perform the same on a pumped unit, just different approach
4. Repeat comparison test if above results not within  $T < .01$  C,  $C < .005$  S/m



2023

Oxygen Optode Check & Calibration

Oxy 4831

pre RU41 RMI 2023 #1 - spring

OPTODE SN	1036	DATE	4/17/2023
FOIL ID	1824m	AIR PRESSURE (hPa)	29.45 in Hg = 997.29 hPa = 748.03 mm Hg
PRE SALINITY	35	CALIBRATED?	yes

\* REMEMBER TO ISSUE THE SAVE COMMAND AFTER CHANGING VALUES

100% SOLUBILITY	257.98 μM = 8.26 ppm	TITRATION	7.2 ppm, 7.2 ppm
	* μM = ppm * 1000 / 32	EPA Na2S2O3 Check	2.1 mL
		Sodium Sulfite / mL	20g / 700mL %

PRE-CHECK	
100%	0%
Conc (μM) = 253.576	Conc (μM) = 3.935
Saturation (%) = 96.951	Saturation (%) = 1.521
Temp (°C) = 24.25	Temp (°C) = 24.845
Phase = 29.884	Phase = 59.058

POST-CAL	
100%	0%
Conc (μM) = <del>257.98</del> 256.276	Conc (μM) = -0.227
Saturation (%) = <del>96.95</del> 97.537	Saturation (%) = -0.87
Temp (°C) = <del>24.25</del> 24.030	Temp (°C) = 24.087
Phase = 30.057	Phase = 59.188

GLIDER CONFIG	
POST SALINITY	32
TEXT OUTPUT OFF	yes

\* REMEMBER TO ISSUE THE SAVE COMMAND AFTER CHANGING VALUES