**Radio Connection to Glider**

* Plug radio to field computer
* Open TeraTerm
* Select *Serial* (see Device manager in computer for port number)
* Put the ON plug to the Glider
* Press *q* before the software starts, you have 10s (if it starts type *$quit)*

 You are in the prompt to modify the configuration files or to go in test mode

 To avoid watch dog (every 7 min) when in prompt type *wd* or to go in test mode

 To go in test mode type *runTester*

**Ethernet Cable Connection to Glider**

* Connect with the Radio
* Type *eth 0* followed by *eth 1* onto the prompt
* If connecting to the payload, type *pdl1 0* followed by *pdl1 1* onto the prompt
* Go in test mode to avoid watch dog while connected with the cable
* Plug the Ethernet cable to the Glider, make sure you are connected to the wanted outlet (NAV/PLD)
* Open TeraTerm (for compass calibration) or Filezilla (load data)
* Select ssh connexion

 Host 192.168.13.227

 Username: user

 Password: (none)

**Opening the Glider at the Front**

* Put the glider on bench frame with a piece of wood under middle-front
* Unscrew the split screws
* Unscrew pressor inlet
* You can put plastic film over O-rings to protect from dust and hair.
* Unplug 4 wires attached to the payload section (see picture below, red circle to unplug, green circle already free). These wires are altimeter, water inlet sensor, FLBBCD and ground.
* Do what you need to do before closing
* Clean and grease O-ring
* To reassemble the payload section on the yellow skull, put the skull vertically on the floor and with another person insert slowly the board and internal weight section in it while being careful not to scratch the part were the O-ring goes.
* Re-plug the 4 wires
* Check ground connexion from an anode to the other
* Clean and grease the O-rings
* Put all glider section together
* Connect to the glider with radio and go in test mode
* Vacuum to a pressure of 78000-80000
* Put the split screw back on by pushing not screwing (split aligned with glider circumference up-down like wanted to take a bit of the glider)
* Check vacuum again



**Ballasting**

* Remove tube with sponge on the Ox sensor and plug proper tubing
* Remove the foams and weights if applicable
* Make sure everything is on the glider (fins, Argos tag, front and back caps, drop weight)
* Open the ballasting spreadsheet
* Weight the glider in air on the scale (cell F21)
* Put the targeted surface density in cell F27
* Stir pool, put CTD in tank, put pool density in cell F28
* Connect with the radio and go in test mode
* Check the vacuum
* Put the actuators to neutral position (linear at 50, angular at 0 and ballast at 0)
* Put the glider in water
* Remove air bubble in the CTD with a syringe, and remove bubble on altimeter
* Read the 2 scales and write it in cells E32 and F32 (if no reading move linear)
* Add foam or weight to make the weight of the glider at sea close to 0 (+/- 50g is fine) Note that with thermal compression the glider gets 4g heavier for every degree Celsius. Example: room T is 24 and water outside is 2, should ballast with a result 88g too light.
* Write the weight in air of foam in D32 and number of washer in C32
* Adjust the linear to make the two reads on the scale close to each other (no more than 58) write in cell L32
* Check the roll by changing the angular +45 -45 (expect reading between 11 and 13) write it in cells M32 and N32
* Lift the Glider and rinse it well
* Put the glider back on its cart
* OFF plug (if not doing a simulation just after)
* Put the tubing with sponge back around the Ox sensor if not deployed in the next few days
* Attach foams and washers to glider

**Compass Calibration**

* Bring with you to the compass hut: Ethernet cable, radio set, ON plug, computer (charged), drop weight, compass, Allen keys to remove fins
* Once at the hub, remove cell phone, magnetic card, keys, wallet, …
* Connect with the Radio
* Type *eth 0* followed by *eth 1* on the prompt
* Go in test mode
* Put the linear actuator to the ballasted value, the angular to 0 and the ballast to 0
* Connect with Ethernet cable to the Nav outlet (ssh connexion on TeraTerm)
* Cut the radio connection by typing *radio 0*
* Write *compass 1*
* Write *compass2 –r /dev/ttyS2*
* You’ll see reading with: Date Time Heading Pitch Roll
* Pitch and roll should be less than 1 degree
* Write down in spread sheet the 4 cardinal points (true or magnetic.. it’s just to compare with after calibration)
* *Ctrl c* to stop the readings
* Write *compass 1*
* Write *compass2 –c /dev/ttyS2*
* Follow what is written on screen (See drawing to know the roll direction)
* Press space when the step is done
* When it’s all over, type *s* to save in /root/calib.txt
* Put roll back to 0.
* Write down in spread sheet the 4 cardinal points after calibration to validate the calibration was okay
* OFF plug

**Simulation**

* Connect with the radio
* Make sure *mode=1* in sea.cfg and that mission # was increased in sea.msn
* Go in test mode
* Check all the parameters and actuators (c v l a b e g f r d)
* Write *runMission* and let the 10s pass
* If you want to test Argos tag as well, plug wire to the tag, open the tagAgent software, go to Advance and check battery many times, go to Disconnect tag and select start
* Make sure Iris is in Manual Mode
* Put the glider outside, wait for Iridium communication (12 good, 3 not good)
* On radio connexion or on Iris, type *$halt=0;* when connected to Iridium (you should see *waiting for go* if it took the command)
* Go to properties to check the boxes to get the data files after every dive and to send $go automatically and uncheck halt=1; box
* Put in *Iris mode*
* Make 5 dives
* Check Argos location on website <https://argos-system.clsamerica.com/argos-cwi2/login.html>
* Type *$quit;* on radio connexion when the 5 dives are done
* Stop the Argos Tag with TagAgent software, go to Disconnect tag and select stop

**Loading raw (delayed) data**

* Connect with radio
* Type in prompt *eth 0* followed by *eth 1, pld1 0* followed by *pld1 1*
* Go in test mode
* Plug the Ethernet cable to the glider.
* Open Filezilla

 Host nav:192.168.13.227 Username: **user** Password: **none**

* Make new mission directory in dropbox with subforlder *nav* and *pld*
* Copy/paste the folder *logs* and *configs* on the field computer
* Check depth, battery voltage, alarms on nav files, science data on pld files
* Make sure *msn.lin.base* is the right value in *sea.msn* andadd one to mission number for deployment
* Change the mode for 0 in *sea.cfg*

**To do before a deployment**

* Charge glider, CTD, GoPro, Mifi, Computer, cell phone
* Put end of mission date on sticker
* Make sure ballasted foams and washers are attached to glider
* Clean and grease plugs
* Put several layers of coat on scratches
* Prep lat long in Piloting software ModuleWP
* Remove sponge, Fill GPCTD with salt water in winter (or air if SEA032)
* Put nose on

**Equipment to bring onboard**

* Field computer + power supply
* Radio set + On plug
* Drop weight + spring (at least 3)
* 25g washer (a lot)
* Foam (at least 2)
* Ethernet cable
* Glider + 2 covers + fins
* Plywood sheet for boat ramp
* Zipties (a lot and different size)
* Duct tape
* Electric tape
* Buoy + safety line
* Bridle system
* Magnet
* Argos cable (just in case)
* Allen keys + Screwdriver
* Side cutter
* Spare plastic screws
* Piloting manuals
* Phone + power supply
* Boat hook + rope
* CTD
* GoPro
* Sat phone
* Mifi
* Cart (if recovery)
* **Turn on Argos Tag, same as for simulation**

**Deployment**

10 min before getting to station:

* Setup computer with power supply
* Connect with the radio
* Turn on the glider by plugging the ON plug
* Make sure *msn.lin.base* is the right value in *sea.msn*
* Make sure *msn.id* is the right mission number in *sea.msn*
* Make sure mode is 0 in *sea.cfg*
* Go in test mode
* Check vacuum, Battery and Release system
* Connect to server
* Put Iris in Manual mode

On station:

* Put CDT in water to check surface density (adjust ballasting with weight and foam if needed)
* Prep glider (unfold antenna, make sure all plugs are there, put 2 caps on, check lock sleeve, Attached buoy with very long bowline)
* Type *RunMission*
* When connected to Iridium, check zb is 30 and alt is 20 in SEANAV sentence
* Turn on Argos Tag with magnet, expect 10 small dots ∙ ∙ ∙ ∙ ∙ ∙ ∙ ∙ ∙ ∙
* Check Iris connection one more time
* If there is a land pilot, ask permission to land pilot to deploy the glider
* Put glider in water
* Put drop weight at last minute
* Check position in water
* Ask permission to land to do the first 30 m dive
* You or land type *$halt=0;* (waiting for go) followed by *$go;*

**After first dive**

* Type *$halt=1;* (waiting for resume)
* Download the nav and date files (or ask land to do so)
* Plot data
* Check data, especially depth symmetry and pitch, should be around +/-20°
* Adjust *$pu* and *$pd* mm if needed (see drawing)
* Remove buoy
* Go for a second 30m dive *$halt=0;* (waiting for go) followed by *$go;*
* Do same steps than after first dive
* Check data, especially vertical speed, should be around +/- 15 cm/s
* Adjust *$bu* and *$bd* ml if needed (see drawing)
* Send glider on mission with ModuleWP
* Check heading commande sent
* Leave glider to land pilot
* Turn off radio (radio=0;), set altimeter to 15 m, set drift correction to 25%, send 2 last data files

**During Mission**

Send Ottawa the template of the MetaData to send real-time data to the GTS

* Check glider every 12h (battery, path, vacuum, pitch, vertical velocity, depth, surfacing rate)
* Check weather forecast
* Log the adjustments made on Glip
* If an alarm strike, make sure to understand what causes it before clearing it..
* If missing data files, can go in manual mode to load them

**Recovery**

* Before last surfacing, put in IRIS mode and go in properties to check the automatic $halt=1; box
* When recovering, remove drop weight first
* Put on deck
* Turn off the glider by replacing the ON plug by the OFF plug
* Turn off Argos Tag with magnet. Expect 3x2 dots **∙ ∙ ∙ ∙ ∙ ∙**

**On land**

* Rinse it well
* Use triton to wash CTD, rinse and then use bleach solution 1:50. Let sit for 10 min and rinse a lot
* Put the tube with sponge back on Ox sensor
* Turn off permanently the Argos Tag by plugging the wire to it, open tagAgent software and using the magnet, go to Disconnect tag and select stop
* Load the delayed data files by connecting with Radio and then Ethernet cable as for after simulation
* Recharge the glider if needed by plugging in glider first and then in wall
* Process delayed mode data in SOCIB