

2014 Spring EcoHAB Wave Glider Navigation Tutorial

MRC 4/11/14

Operating Instructions - Navigation

- **Liquid Robotics Operational Desk: 408 636-4205**
- Drive WG back and forth between ESP circles to rendezvous with the LRAUV Daphne.
- The Approach waypoints (114, 115, 116, 117) are to provide a clear path to next circle.
- Use the **Follow Sequential Course Command** and enter the following:
 - 1. Target Waypoint: First approach waypoint to have a clear exit from current circle position.
 - 2. From Waypoint: Same as Target Waypoint.
 - 3. To Waypoint: Approach waypoint for the next circle (*note, without a new course the WG will cycle between the from and to Waypoints*).
- When the WG is on it's way and can approach the new circle without any obstruction, then issue a new **Follow Sequential Course Command** :
 - 1. Target Waypoint: First waypoint in the new circle that can be reached from the current position without obstruction.
 - 2. From Waypoint: Lowest number Waypoint in the circle.
 - 3. To Waypoint: Highest number Waypoint for the circle.

The WG will enter the circle at the Target Waypoint and advance sequentially through the Waypoint sequence and repeat.

E.G. to enter the NE (MACK) circle:

Target Waypoint: TBD

From Waypoint: 12

To Waypoint: 19

E.G. to enter the SW (BRUCE) circle:

Target Waypoint: TBD

From Waypoint: 104

To Waypoint: 111

AUV Location

- Use tethys dashboard -
<http://aosn.mbari.org/TethysDash/?vehicle=daphne> and click on the latest data log file.
- Drag or copy the shore.kmz file into Google Earth to see where the LRAUV is.
 - Note: Green is track starting location and Red is end.
- Vector the WG to the appropriate side of the circle (see navigation above).

Payload

- If we need to save power, then turn off the Freewave when LRAUV is not in range; ssh into hotspot3g and issue "sudo fwOff". But leave SMC and CDMA on to allow synching with shore, and interactive sessions with the SMC.
- If we need to conserve more power, then turn off the Hotspot SMC; ssh into hotspot3g and issue a "sudo halt". Then turn off SMC power through WGMS. This means no synch'ing with shore or AUV. It doesn't make much sense to turn off both the Freewave and the CDMA, but leave the SMC running.

ssh hotspot@hotspot3g.mbari.org

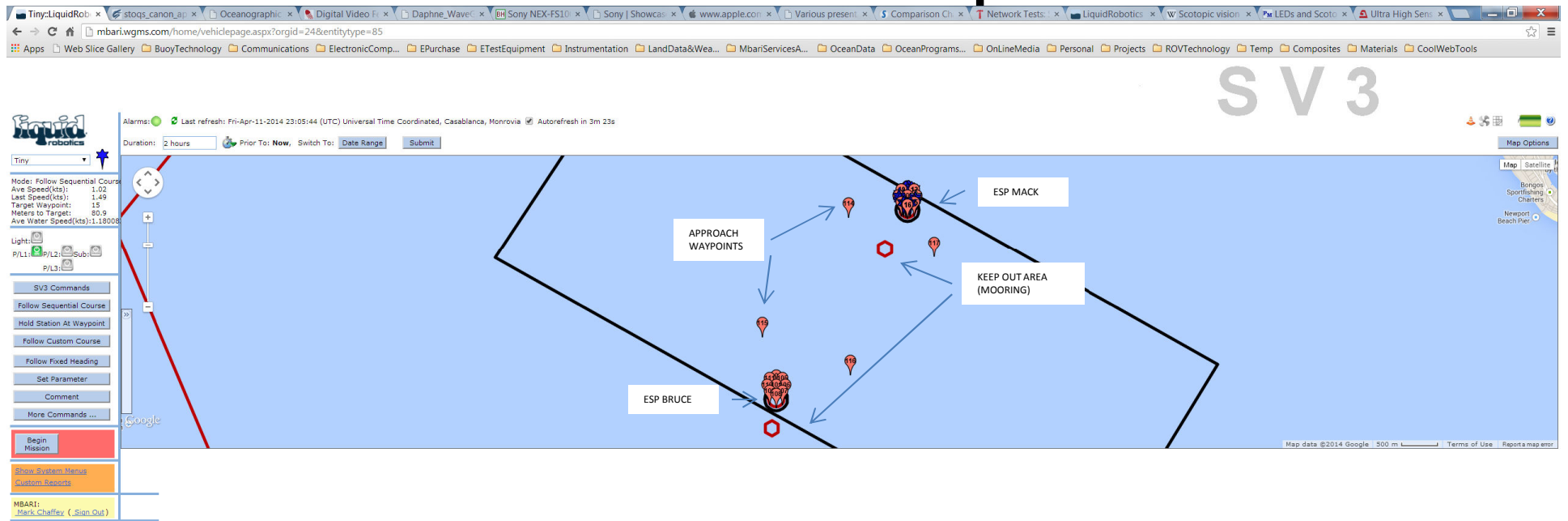
Login: hotspot

Password: **ynner

>sudo halt

- When we need the Freewave for LRAUV rendezvous:
- a) If SMC is on and CDMA is on, then ssh into hotspot3g and issue "sudo fwOn"
- b) If SMC is on but CDMA is off (unlikely), then power-cycle the SMC through WGMS
- b) If SMC is off, turn on SMC through WGMS
- Whenever the SMC is on, I think it best to have the CDMA on as well if we can afford the power. During last month's sea trials the LR "runshell" mechanism proved a very unreliable way of controlling the Hotspot radios, and I have heard nothing from LR regarding a fix for this.

Overall Map



Tiny Communications

TimeStamp	Target	SOG (kt)	POG (deg)	Desired ...	Sub Hea...	Water S...	Current Speed ...	Current Headin...	Lat (deg)	Lon (deg)	Battery ...	Command	Reason	Error Type
2014/04/11 23:05	0	0	0						0.00000	0.00000	0	New Waypoint ...	New Waypoint ...	
2014/04/11 23:05	15	1.49	130	204	203	1.1560	1.39	77.07	33.60753	-118.01760	655.35	New Waypoint ...	New Waypoint ...	
2014/04/11 23:04	0	0	0						0.00000	0.00000	0	New Waypoint ...	New Waypoint ...	
2014/04/11 23:03	0	0	0						0.00000	0.00000	0	New Waypoint ...	New Waypoint ...	
2014/04/11 23:01	0	0	0						0.00000	0.00000	0	Read Waypoint...	Read Waypoint...	
2014/04/11 23:01	0	0	0						0.00000	0.00000	0	New Waypoint ...	New Waypoint ...	

Tiny Commands

TimeStamp	Command Reason	Command	Comma...	Combined Acks	Created By
2014/04/11 23:05	New Waypoint #117 latitude=33.60203...	New Waypoint #117 latitude=33.60203823188...	Sent		Mark Chaffey
2014/04/11 23:04	New Waypoint #116 latitude=33.58816...	New Waypoint #116 latitude=33.58816834499...	Sent		Mark Chaffey
2014/04/11 23:03	New Waypoint #115 latitude=33.59260...	New Waypoint #115 latitude=33.59260123175...	Sent		Mark Chaffey
2014/04/11 23:01	Read Waypoint 114	Read Waypoint 114	Sent		System Admin
2014/04/11 23:01	New Waypoint #114 latitude=33.60672...	New Waypoint #114 latitude=33.60672060240...	Acked		Mark Chaffey
2014/04/11 21:00	CONFIG: Wx On	Set Parameters: Weather Station Power=1 on...	Acked		David Hume

Copyright © 2007-2014 LiquidRobotics Corporation. All rights reserved.

Software License

2014_04_04_Sta...pdf LM5JC10M.pdf OI Wide Angledoc HeidiBaja.jpg MBARIHDL50HS...rtf Codex Digital L...pdf

Show all downloads...

Waypoint: New ... SonyHDC-P1_Us... 10020893SCH-4... 2014_03_20_Mic...

Desktop 4:07 PM 4/11/2014

NE Circle

Tiny: Liquid Robotics

stqs: canon_a... Oceanographic Digital Video Fi... Daphne Wave... Sony NEX-FS10... Sony | Showcas... www.apple.com... Various present... Comparison Ch... Network Tests... LiquidRobotics... Scotopic vision... LEDs and Scoto... Ultra High Sen...

mbari.wgms.com/home/vehiclepage.aspx?orgid=24&entitytype=85

Apps Web Slice Gallery BuoyTechnology Communications ElectronicComp... EPurchase ETestEquipment Instrumentation LandData&Wea... MbariServicesA... OceanData OceanPrograms... OnLineMedia Personal Projects ROVTechnology Temp Composites Materials CoolWebTools

SV3

Alarms: Last refresh: Fri-Apr-11-2014 22:23:13 (UTC) Universal Time Coordinated, Casablanca, Monrovia Autorefresh in 0m 49s

Duration: 2 hours Prior To: Now Switch To: Date Range Submit

Liquid Robotics

Tiny

Mode: Follow Sequential Course
Ave Speed(kts): 0.92
Last Speed(kts): 1.53
Target Waypoint: 13
Meters to Target: 41.3
Ave Water Speed(kts): 0.74408

Light: P/L1: P/L2: Sub: P/L3:

SV3 Commands

Follow Sequential Course
Hold Station At Waypoint
Follow Custom Course
Follow Fixed Heading
Set Parameter
Comment
More Commands ...

Begin Mission

Show System Status
Custom Reports

HBARI: Mack Chaffey (Sign Out)

Google

Map data ©2014 Google 20 m Terms of Use Report a map error

Tiny Communications

Time Stamp	Target	SOG (kt)	POG (deg)	Desired ...	Sub Hea...	Water S...	Current Speed ...	Current Headin...	Lat (deg)	Lon (deg)	Battery ...	Command	Reason	Error Type
2014/04/11 22:20	13	1.529	55	121	120	1.2200	1.35	359.58	33.60857	-118.01825	655.35			
2014/04/11 22:15	19	0.842	327	6	9	1.2410	0.87	220.31	33.60756	-118.02000	655.35			
2014/04/11 22:10	17	0.745	272	265	258	1.2300	0.68	65.70	33.60678	-118.01939	655.35			
2014/04/11 22:05	16	0.803	224	236	239	1.1020	0.51	77.59	33.60675	-118.01842	655.35			
2014/04/11 22:00	15	1.361	148	202	203	1.1590	1.04	82.26	33.60738	-118.01768	655.35			
2014/04/11 21:55	13	1.4	42	111	107	1.2230	1.31	344.05	33.60868	-118.01863	655.35			

Page 1 Goto

Tiny Commands

Time Stamp	Command Reason	Command	Comma...	Combined Acts	Created By
2014/04/11 21:00	CONFIG: Wx On	Set Parameters: Weather Station Power=1 on...	Acked		David Hume
2014/04/11 20:59	CONFIG: WSS On	Set Parameters: Water Sensor Power=1 on v...	Acked		David Hume
2014/04/11 17:28	powering up for comms	Set Parameters: Payload 1 Power=1 on vehic...	Acked		Brian Kieft
2014/04/11 14:14	PIC: David Hume	Comment	Created		David Hume
2014/04/11 02:16	PIC: Michael Stiller	Comment	Created		Michael Stiller
2014/04/11 02:05	Success! Done for now	Set Parameters: Payload 1 Power=0 on vehic...	Acked		Brian Kieft

Page 1 Goto

Copyright © 2007-2014 LiquidRobotics Corporation. All rights reserved.

Software License

2014_04_04_Sta...pdf LM5JC10M.pdf OI Wide Angledoc HeidiBajajpg Removed MBARIHDL50HS...rtf Codex Digital L...pdf

Show all downloads...

C:\chma_main... C:\chma_main... \Atlas.shore.m... C:\chma_main... C:\chma_main... C:\chma_main... Video&Camer... CameraAndDa... PasswordList... izMAP_Camera... Presentation4 ... www.pierretos... Tiny-LiquidRo... Desktop

3:27 PM 4/11/2014

SW Circle

isteqs_canon_ap x Oceanographic x Digital Video Fi x Daphne_Wave x Sony NEX-F510 x Sony Showcas x www.apple.com x Various present x Comparison Ch x Network Tests x Ultra High Sens x Tethys Dashbo x Daphne 20140 x TinyLiquidRob x Zimbra: Inbox x

mbari.wgms.com/home/vehiclepage.aspx?orgid=24&entitytype=85

Apps Web Slice Gallery BuoyTechnology Communications ElectronicComp... EPurchase ETTestEquipment Instrumentation LandData&Wea... MbariServicesA... OceanData OceanPrograms... OnLineMedia Personal Projects ROVTechnology Temp Composites Materials CoolWebTools

SV3

Alarms: Last refresh: Sat-Apr-12-2014 1:53:58 (UTC) Universal Time Coordinated, Casablanca, Monrovia Autorefresh in 4m 46s

Duration: 1 hour Prior To: Now, Switch To: Date Range Submit

Tiny

Mode: Follow Sequential Course
Ave Speed(kts): 1.38
Last Speed(kts): 1.45
Target Waypoint: 13
Meters to Target: 40.5
Ave Water Speed(kts): 1.38683

Light: P/L1 P/L2 Sub: P/L3

SV3 Commands

Follow Sequential Course

Hold Station At Waypoint

Follow Custom Course

Follow Fixed Heading

Set Parameter

Comment

More Commands ...

Begin Mission

Show System Menu

Custom Reports

MBARI: Mark Chaffey (. Sign Out)

Google

Map data ©2014 Google 50 m Terms of Use Report a map error

Timestamp	Target	SOG (kt)	POG (deg)	Desired ...	Sub Hea...	Water S...	Current Speed ...	Current Headin...	Lat (deg)	Lon (deg)	Battery ...	Command	Reason	Error Type
2014/04/12 01:50	13	1.451	61	109	108	1.5200	1.13	339.80	33.60853	-118.01827	655.35			
2014/04/12 01:45	19	1.05	331	29	27	1.4230	1.18	243.87	33.60770	-118.02003	655.35			
2014/04/12 01:40	17	1.302	243	289	298	1.2920	1.10	169.51	33.60666	-118.01932	655.35			
2014/04/12 01:35	15	1.685	136	185	193	1.2230	1.16	74.53	33.60732	-118.01775	655.35			
2014/04/12 01:30	12	1.322	25	73	72	1.6020	1.18	295.69	33.60855	-118.01916	655.35			
2014/04/12 01:25	18	1.043	297	341	335	1.3450	0.86	191.44	33.60716	-118.01995	655.35			

Timestamp	Command Reason	Command	Comma...	Combined Ack	Created By
2014/04/11 23:06	Read Waypoint 117	Read Waypoint 117	Acked		System Admin
2014/04/11 23:06	Read Waypoint 115	Read Waypoint 115	Acked		System Admin
2014/04/11 23:06	Read Waypoint 116	Read Waypoint 116	Acked		System Admin
2014/04/11 23:05	New Waypoint #117 latitude=33.60203...	New Waypoint #117 latitude=33.60203823188...	Acked		Mark Chaffey
2014/04/11 23:04	New Waypoint #116 latitude=33.58816...	New Waypoint #116 latitude=33.58816834499...	Acked		Mark Chaffey
2014/04/11 23:03	New Waypoint #115 latitude=33.59260...	New Waypoint #115 latitude=33.59260123175...	Acked		Mark Chaffey

Copyright © 2007-2014 LiquidRobotics Corporation. All rights reserved.

Software License

shore (1).kmz shore.kmz 2014_04_04_Sta...pdf LM5/C10M.pdf OI Wide Angledoc HeidiBaja.jpg Removed MBARIHDL50HS...rtf Codex Digital L...pdf

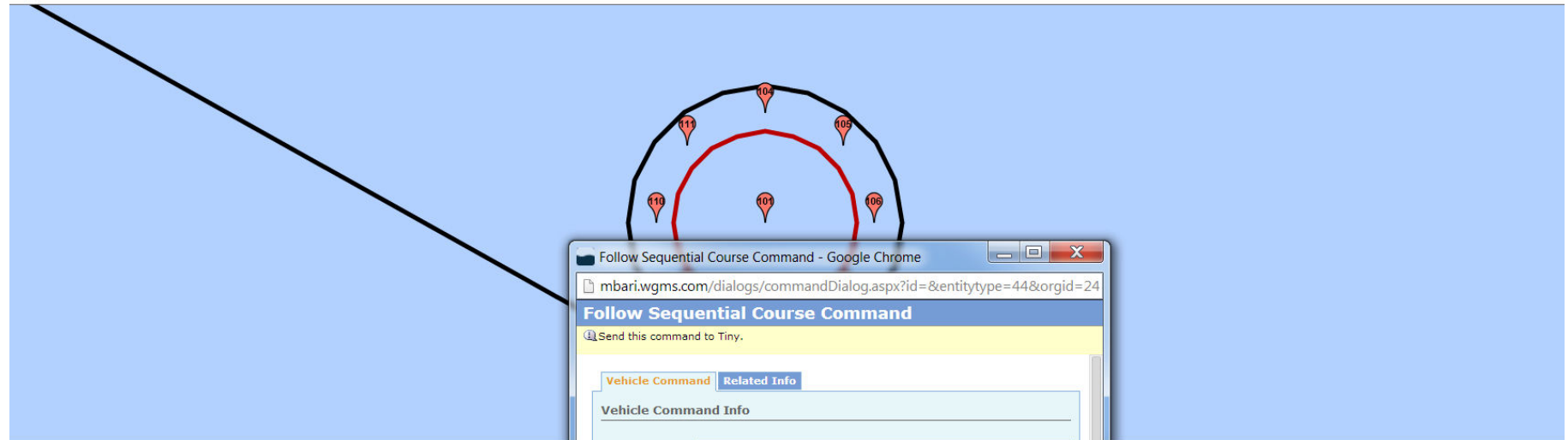
Show all downloads...

C:\chma_main... C:\chma_main... \Atlas.shore.m... C:\chma_main... C:\chma_main... X:\901411.HotS... X:\901411.HotS... X:\901411.HotS... X:\901411.HotS... Video&Camera... CameraAndDat... PasswordList.xls... Desktop 6:54 PM 4/11/2014

I2MAP_Camera... ecoHAB_WaveG... www.pierretosc... Tiny-LiquidRob... Follow Sequenti... SonyHDC-P1_Us... 10020893SCH-4... 2014_03_20_Mic... Google Earth

Follow Sequential Course Command

Prior To: **Now**, Switch To: **Date Range** **Submit**



Follow Sequential Course Command - Google Chrome

mbari.wgms.com/dialogs/commandDialog.aspx?id=&entitytype=44&orgid=24

Follow Sequential Course Command

Send this command to Tiny.

Vehicle Command Related Info

Vehicle Command Info

Command Rea...

Vehicle Tiny Command Type Follow Waypoint Cour

Command Stat... Created Target Waypoint

From Waypoint To Waypoint

Heading (deg) Status

Course Vehicle Rudder...

Storage Address Board Address

File Type Unspecified Operation Type Current Image

Com Channel VirtualRelayCell Comr Upload File

Send Cancel

POG (deg)	Desired ...	Sub Hea...	Water S...	Current Speed ...	Current Headin...	Lat (deg)
1	109	108	1.5200	1.13	339.80	33.60853
11	29	27	1.4230	1.18	243.87	33.60770
13	289	298	1.2920	1.10	169.51	33.60666
16	185	193	1.2230	1.16	74.53	33.60732
5	73	72	1.6020	1.18	295.69	33.60855
17	341	335	1.3450	0.86	191.44	33.60716

Command	Comma...	Combined Ack	Created By
Read Waypoint 117	Acked		System Admin
Read Waypoint 115	Acked		System Admin
Read Waypoint 116	Acked		System Admin
le=33.60203... New Waypoint #117 latitude=33.60203823188...	Acked		Mark Chaffey