Space Details

Key:	Waveglider
Name:	901310 Waveglider
Description:	
Creator (Creation Date):	tm (Jan 29, 2013)
Last Modifier (Mod. Date):	tm (Jan 29, 2013)

Available Pages

- Waveglider Tex 2013
  - Waveglider RUDICS
  - Waveglider Tex 2013 Log
  - Waveglider Towbody
  - WGMS User Feedback

Waveglider Tex 2013

This page last changed on Sep 22, 2015 by tm.

WGMS User Feedback

Waveglider 'Tiny'

Tiny was purchased in 2013 and was the first customer shipment of an SV3 waveglider. Tiny was factory acceptance tested in Feb 2014 and has been in service since.

Waveglider 'Tex'

This is the home page for the 901310 Waveglider Feasibility study.

MBARI has leased a waveglider for 365 days starting in Feb 2013.

This waveglider is named 'Tex' after the engineer on the Western Flyer in the Steinbeck book, "Log from the Sea of Cortez", http://caviews.com/wflyer.html

Waveglider Tex 2013 Log

Open Issues

- BEDS, Autonomy, LRAUV team project needs - schedule and support engineering time
  - Waveglider Towbody
- RUDICS data management Waveglider RUDICS

Task Timeline for Waveglider Tex Support

- May 20 Document and align on new plan for towbody support (TM, BK, PC, MC)
  - custom MBARI designed (Bird/Kieft) sub mounted payload box with SMC and room for future possibility of integrating an HV supercap boost board for acoustic modem (3"w x 6"h x 2.5"thick) Payload design is TBD
- May 24 Review with Liquid Robotics the new wiring and software plan for towbody acoustics / deliver issues and recommendations (TM, BK) DONE
- May 28 Design, document new cables (PC)
- May 29 Review and Order cables (PC) - added power and ground for future option of power grafting from PAYLD2 into aft payload box
- Jun 3 - Jun 7 (PC) to provide support for MC HotSpot integration effort - as needed by MC
- Jun 4 (PC, TM) review GPCTD plumbing changes made on OA waveglider by Chris Wahl - Chavez lab found that the LR plumbing scheme is not correct. Date to fix is flexible, need to be done by July. Earlier is better.
- Jun 6 (PC) prep 15lb? ballast plate for mounting inside aft payload box
- Jun 5 - 7 (TM on vacation)
- Jun 10 (PC, TM) morning waveglider in test tank to ballast and trim ballast plate (or other ideas?), afternoon prep Paragon for Tex launch on Tue the 11th
- Jun 11 (PC, TM, + crew) Launch Tex at the 'usual site' 3 to 5 miles from MBARI over the canyon
- Jun 12 (TM, PC) Monitoring Tex and providing shore side support for Chaffey HotSpot testing, Paragon on standby in case of recovery
- Jun 13 (TM, PC) Monitoring Tex, Paragon on standby
- Jun 14 (off day), (TM) Monitoring of Tex,
- Jun 17 (TM, PC +crew) Recovery of Tex in the morning, Paul is captain, Thom on crew, need two more crew - candidates are Mike Kelley, Brian Kieft, Brett Hobson(new), Chris Wahl, Gene Massion
- Jun 18 (TM, PC) DOEST at 11:20 to 11:55 (15 minute slice in that window)
- Jun 19 (TM, PC) Support for Brian Kieft / Brett Hobson DARPA project. Attach an acoustic device (no power or data connection) to support their testing with LRAUV
- Jun 20 or 21 (TM, PC, BK, BH?) Launch Tex
- Jun 24 - 27? Shoreside support for DARPA team, Paragon on standby if needed (TM possibly on vacation)
- Jun 28 (TM, PC, BK, BH, MK) Tex recovery
- Jul 11 (??), Possible HotSpot. MC out of office, KR out of office, TO would lead the test effort (discussed via email by MC)

Platform Timeline (March-April 2013)

U	P	2	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9	1	10/13
Raj	Autonomy								C	C	C																							
Char	VFG HotSpot															P	P	P	P															
Kiel	BEDS																T	T	T															
Stac	CANON / DARPA																		T	T	T	T												
Mat	Tech Cap	P	P	Train	P	P	P	P	P	P	P	P	P	P																				
TBD	TBD																																	

P=PREP, L=LAUNCH, R=RECOVERY, T=TOWBODY, C=CANCELLED

User info

- Xbee setup procedure
  - Install open vpn: http://swupdate.openvpn.net/community/releases/openvpn-2.1.4-install.exe
  - run XBEE relay package installer located in project library: X:\901310_WaveGlider_Feasibility \WaveGliderDocs_CD_From_LR_2013_Feb_11\XBee Relay Package\Software
    - Reference the System Administrators Guide in the directory up from software for XBEE, specifically section 4.5
  - username: mbaritex, password (see thom)
    - reflector IP: 10.20.1.41
    - reflector Port: 9748
    - Relay IP: 10.20.17.153
    - Relay Port: 9749

Task List

- Proposal (done 9/2012)
- Quote / PO (done 10/2012)
- Pickup and Waveglider Overview. Establish POC (done 6 Feb 2013)
  - POC
    - Jamie Griffith, LR main point of contact.
      - Jamie indicated verbally in the meeting on Feb 6 that LR is liable for damages when they are piloting the vehicle. Avoided answering the question about liability during deployment / Recovery
    - Paul Wyatt, LR VP of Data Services, office: 408-636-4272, cell: 650-678-0461, email paul.wyatt@liquidr.com
    - Doug Carlen - LR legal, liability, contract issues
    - Ryan Carlon, LR application engineer - will be brought in as needed by Jamie
    - Thom Maughan, MBARI, Project Manager for Waveglider feasibility study project 901310, tm@mbari.org, x1865, cell 805-245-4890 (text preferred)
    - Paul Coenen, MBARI, Electro-mechanical technician, experienced mooring tech, xx@mbari.org, x2099, cell 831-334-7285
  - WGMS access for Paul, Thom
    - mbari.wgms.com
    - hint: ok why gmail
- Clarify MBARI responsibility for Waveglider during storage, transport, launch and recovery
  -
- Unpack and Assemble
  - store crates at Castroville

    - move to storage container
- Work area for integration
    - Requirements: access to test tank, access to power, access to sky for iridium, access to ethernet, access to roll cart to Paragon
    - Storage container at ground floor near test tank (done 5 Feb 2013, thankyou Dale Graves)
- SMC software development environment
    - SMC dev setup in software lab on cart (done 7 Feb 2013)
    - Install linux development environment and cross compiler for omap device in SMC
    - Come up to speed on software environment
    - Write driver for fluorometer
- Communications
    - RUDICS account transfer from UCSC (done 20 Jan 2013)
    - Work with accounting on RUDICS billing / sharing between projects based on IMEI number
    - RUDICS setup in IS (move off Chavez lab laptop)
    - ODSS integration
    - LR WGMS data integration
- File Mission plan with Liquid Robotics
    - Sortie 1: identifiy training day
    - Sortie 2: shakeout cruise - several days at minimum
    - Sortie 3: TBD mission for autonomy?
-
- Deployment and Recovery Training
    - MOCC Boat training and certification for Paul and Thom (done 1 Feb 2013)
    - Paragon operational checkout and certification by Jared Figurski (delayed due to Paragon problems, unknown schedule as of 25 Feb 2013)
    - Contingency plan is to use the Sheila B (which is also getting repairs, likely available first or second week in March) - possible cost share with LR on OA Waveglider deployment
    - Waveglider liability issue needs to be resolved.
- Paragon fittings
    - need cart lash down spot
    - need to checkout waveglider load and paragon hoist capabilities
- Boat Options
    - as of 12 Feb 2013
        - John Martin is hauling out today or tomorrow, and will be on dry land getting serviced for several weeks, and won't be available until mid-March.
        - The Sheila B is still out of the water because the wrong part was shipped, and now "they" can't find the right part anywhere.
        - Options remaining: the Paragon, the Carson, and the Shana Rae right off the top of my head. And the Carson is pretty booked.
- Sensor integration
    - Float Sensors
        - Gernot pCO2 and pH (this action was initiated by Chavez lab end of Jan 2013, cancelled mid-Feb 2013 since Chavez lab will have access to the LR OA Waveglider)
    - Sub Sensors
        - Fluorometer
            - Select Fluorometer: Wetlabs BB2F, WS38, Ecopuck. DGH analog to serial converter.
            - Mount to sub
        - Seabird 18s
    - Tow Body Sensors and Modems
        - 'TBD' acoustic modem for talking to BEDS
        - DAT for talking to LRAUV / Lagrangian float
        - Benthos Modem for talking to Dorado
        - Notes
            - Serial aggregator
    - Notes
        - solidworks recommended for mounting brackets
        - order connectors and cables
- Shakeout mission and Deployment / Recovery training and compentency

- ECOHAB Mar 14 - 28 (cancelled due to late arrival of Waveglider and delay in getting deployment/ recovery training
    - work out intervention plan if Waveglider has trouble transitting from Monterey Bay to Southern California

        - Options: Vessel recovery services (last resort), Morro Bay and Santa Barbara Yacht club, Fisherman contacts

closed action items

- MBARI Liability during launch/recovery, when MBARI is piloting directly, when stored at MBARI, when transported in MBARI vehicles
- Paragon availability for Thom/Paul checkout, Waveglider launch and recovery training on Paragon
- Payload boxes were not as ordered, resolved.

Autonomy Use Case:

- just as before when Dorado was following a drifter
- waveglider as a drifter doing a pattern that is static (do we get Waveglider SBD's forwarded?)
- fpy needs rabbitmq protobuf message
- sbd back to Dorado directly
- Dorado sends freewave to the Waveglider and waveglider sends via RUDICS and Waveglider receives via RUDICS and sends via Freewave to Dorado
- Dorado Mission will be designed to collocate
- as preparation, a freewave modem will be connected to a "Dorado like" antenna and towed by the Paragon or other small boat

Notes

- Project did not properly identify support resource, this was corrected mid-Jan with a PCO request for 100hrs of electro-mech tech time (Paul Coenen).
    - Was able to trade Paul for Kanna for the MOCC boat cert (Jan. 28 - Feb 1) and Paragon qualification
    - Paul and Thom both passed MOCC on Feb. 1
    - Paragon qualification delayed due to boat engine troubles (Feb. 4, could be a week or two)
    - Paragon qualification request sent to Katie on Feb. 7
    - Waveglider stinks for several weeks after recovery - wash down procedure, etc required
    - RV John Martin, Sheila B
- WG Name
    - Kraken, Pip, Lisa, DaveCat, Oceana
    - Alg: suggest four names, each person can remove 1 name from those suggested by the others, names in hat, draw 8 times, most draws wins, flip coin to break tie, multiple tie, draw one from hat
- WG Peeps
    - JP assembly, Tom assembly, Raza assembly mgr, 'other' assembly mgr (found the tether bracket was assembled backwards)
- Wavegliderisms
    - turtle box - cnc (command and control) box
    - smack - smc - sensor management computer - omap3
    - active radar - echomax - can the software on smc know if active radar got pinged? looks like it since it has a cnc connection
    - auxillary iridium tracker, 'shout' tracker for hikers
        - arm this before deployment (unscrew, etc)
    - two fish trackers, 151.635 KHz
        - arm these once all year
    - CNC
        - has on/off plug, disconnect when shipping
    - Payload 3 is active radar
    - Payload 1 is...
    - AIS Antenna, receiver only, not an AIS transmitter
    - GPS/Iridium SBD antennna
    - Rudder - 5 screws
    - Cable feed, 'p clips' for cable mgmt
    - For shipping

        - remove skeg
        - masts and antennas lay em down
        - 65E51C59 unique id

Towbody notes

- per the quote, the towbody was identified as 'engineering services' with no part number listed. Jamie indicated this was necessary since the tow body was not a standard order item as of Sep 2012
- Notes from LR
    - Assuming that they ordered the "Acoustic Towbody, no modem" (p/n 04070), then they get tow cable p/n 03897. The pinout for this cable is as follows:

-
    -
        - Pin 1 Aux3
        - Pin 2 n/c
        - Pin 3 n/c
        - Pin 4 n/c
        - Pin 5 Aux1
        - Pin 6 Aux2
        - Pin 7 n/c
        - Pin 8 Aux4

-
    - This kit is designed to both control and power the acoustic modem in the tow body from a payload box in the float. The tow cable is wired assuming that the power is coming to the acoustic modem on pins 5 & 6 (we use pin 5 for power, pin 6 for ground) and the serial communications are on pins 1 & 8 (in our implementation we use pin 1 for "Float Tx" and pin 8 for "Float Rx". Also note that because this application uses both pairs of Aux lines, it means that the payload box in the float needs to be connected to both Payload ports 1& 2.

Waveglider Feasibility and Support Engineering project

- Program Snapshot for contract with Liquid Robotics:
    - One-year of Ocean Data Services
    - One year lease for $65,000 (USD), payable in full within thirty (30) days after the Wave Glider is delivered to Customer
    - Wave Glider as-a-service for a period of one year for your projects
    - The Wave Glider equipped with the following sensors:
        - Airmar PB200 Weather Station
        - Seabird GPCTD is mounted on the float
    - Management, collection and delivery of the data collected by the Wave Glider ("Data") to your institution and Liquid Robotics will retain a royalty-free license to use the Data but will agree not to distribute the Data to third parties prior to your publication of your research results.
    - Liquid Robotics will provide up to $35,000 (USD) in Wave Glider engineering services to support Customer; any additional engineering services will be billed to Customer at Liquid Robotics then-prevailing rates. Such services may include:
        - Initial operations and maintenance training for academic institution staff
        - Consultation and support of payload integration performed by customer
        - Customer will reimburse Liquid Robotics for any travel or other out-of-pocket travel expenses incurred in connection with providing the engineering services
        - Support for integration of additional sensors by the institution will be treated as billable engineering services
    - No integration work may be performed without consultation with and agreement from Liquid Robotics.
    - Ownership of intellectual property that results from joint engineering efforts is described in the Terms and Conditions http://www.liquidr.com/legal/terms-and-conditions-data-services/
    - For sensors that Customer independently develops in connection with the use of the Wave Glider, Liquid Robotics will receive a first right of refusal to license and develop such sensors.
    - Customer is responsible for communications costs and launch & recovery logistics
    - In return for the exceptional offer, the customer agrees to publish results, write a paper and share designs with Liquid Robotics
    - Non-profit Academic / Research institutions only. No commercial or government use permitted, including any use as a government sub-recipient or subcontractor.
    - This 1 year lease offer is for a limited time and is valid for contracts received before December 28, 2012

Comments

Under POC section:

Paul Coenen, xx@mbari.org, x2099, cell 831-334-7285

should be

Paul Coenen, coenen@mbari.org, x2099, cell 831-334-7285

Posted by coenen at Feb 14, 2013.

Waveglider RUDICS

This page last changed on May 29, 2013 by tm.

Iridium RUDICS

Overview

- A spinoff of 901310_Waveglider Feasibility is the investigation of using Iridium RUDICS to replace or complement Iridium SBD to lower cost of Iridium communications.
- Other projects have expressed interest in using RUDICS. Coastal profiling float, AUV / LRAUV
- Shore side infrastructure. $2500 setup fee is required. After some investigation it was found that UCSC has a RUDICS account that is used to ingest data from Webb Gliders managed by the Chavez lab. UCSC agreed to transfer the account to MBARI in exchange for MBARI absorbing RUDICS charges in 2013. Thereafter it is the responsibility of the project or lab running the gliders to provision for the RUDICS communication charges.

In order to dial a Mobile Originated call, the remote modem must first dial the DNIS (phone number) associated with a particular RUDICS group. The owner of this group would provide this.

For a Mobile Terminated call, the server calls the MSISDN-C of the SIM card. The MSISDN-C is the data phone number (as opposed the MSISDN which is the voice number also issued at the same time).

If I recall correctly, this group was set up as a Standard group meaning the RUDICS airtime fee applies to Mobile Originated calls only. The MSISDN-C can be called anytime using a regular Circuit Switched Data call. We post the MSISDN-C's of activated SIM cards on our billing site http://billing.joubeh.com

The rates for the two services are USD$0.60/min. for RUDICS and USD$0.90/min. for CSD. Our billing system distinguishes the two calls.

Regards,

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Waveglider Tex 2013 Log

This page last changed on Nov 04, 2013 by tm.

This is the log of the Waveglider Tex

2013 Mar 26

- Launch and Recovery training with Lorraine of LRI

2013 Mar 27 to 2013 Apr 2

- Shakeout cruise, ctd

2013 Jun 5 to 2013 Jun 6

- LRAUV acoustic test

2013 Jun 12 (changed from 11th) to 2013 Jun 17

- Launch using the RV John Martin (Paragon down for repairs)
- HotSpot testing
- Recovered by RV John Martin for for DOEST

2013 Jun 20 to 2013 Jun 28

- DARPA LRAUV acoustics

2013 Aug 22 to 2013 Aug 28

- Brian / Brett (thanks!) recovered Tex since LR indicated the the C&C need to be pressurized. Looks like someone vented or opened the C&C while it was in the storage container June/July
  - Note: scuffing on the side looks like it had been struck by a boat, not scratches but material from the offending boat
- C&C pressurized to 4ish psi by Paul Coenen, WGMS shows 128 to 129

2013 Aug 28

- Firmware Update thru Xbee from LR (Kim Hosaka)
  - FCC - 2.00.995
  - IPIB - 1.3.365
  - PIB - 2.1.395
  - Power Manager - 0038.236
  - Bubble Controller - 044.015
  - C&C Pressure holding 128 to 130 depending on temperature

2013 Aug 28 to 2013 Oct 22

- Waveglider recovered by request of HotSpot team Sep 24, redeployed Oct 1 (2)?

Waveglider Towbody

This page last changed on Oct 28, 2013 by tm.

Waveglider Towbody Support

- High Level Requirements for Towbody Acoustic Modem Current Boost Converter
  - Supply and manage electrical power for two acoustic modems mounted in Waveglider Towbody
  - 24v @ 1.5A
  - Must not draw more than the maximum allowable current from Waveglider sub power
  - 12v @ 0.5A (or possibly 1.0A)
  - Only one acoustic modem will be used at a time
  - Initially only one transducer is mounted in the towbody at a time, should support field swap of transducer
  - In the future, when the towbody is expanded, two transducers can be mounted. Only one acoustic modem would be active at a given time.
  - Support for different output voltages, possible for an ADCP operating at 48v.
  - One serial (Rx, Tx) pair is available from communications to the WG Float, this needs to be multiplexed to up to 3 serial devices.
  - Benthos LF modem will be used to ping the Benthic Event Detector - need to support max acoustic transmit power.
  - Ping repitition rate is somewhat flexible as long as use of WG for locating BEDS is supported (1 m/s). Design goal is 10% duty cycle at max transmit power.
  - Size (TBD), for now aiming at 5" diameter x 2.5"
  - Must withstand pressure of 10m (Sub depth plus sunken towbody) or be designed to fit in sub mounted custom payload box or towbody dry box. ** ** Design for 25m depth
  - Budget constrained: Labor and Cost constrained. This effort was not initially scoped during the project proposal/budget. Target cost is $2K.
  - Should use off the shelf components where possible since labor is constrained as well.

Notes:

- Available by June. Use of readily available components or existing designs
- Liquid Robotics engineering team offered their boost converter float design so that we could re-layout and put in sub. Not available yet.

WGMS User Feedback

This page last changed on Sep 22, 2015 by tm.

MBARI list of WGMS issues and suggestions for the new WGMS (code name Leo)

- There needs to be a way to group waypoints into a 'mission set' and to archive those off and be able to retrieve them later. This grouping should include swim lanes, exclusion zones, etc
- Payload mapping in WGMS - there should be a way to map the 'human name' to the payload port number, example: OA payload on S3, Sensor SMC on Integrator G1, etc. This can be done in the comment field, but it would be nice as a hover over the payload control icon
- Make the state of the payload icon match / sync with the state of the vehicle - if the state is unknown, the color it / id it as unknown also (in addition to on / off / fault)