

	Manufacturing Process Instructions	Document Number: 070-04263 Revision: B
	MPI, SEEP TURBIDITY TOWBODY, 03846	

REVISION HISTORY			
Revision Level	Effective Date	Initiator	ECO Number
A	1/14/2013	J.Villegas	ECO-002930
B	3/4/2013	J.Villegas	ECO-003002
Section Number	Description and Justification of Changes		
ALL	Release to production		
7.7	Correct Typos in Section 7.7 and in Header		

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1 PURPOSE

This document provides detailed work instructions on how to assemble and test the SEEP Turbidity Towbody assembly (PN 03846).

2 SCOPE

This procedure applies to the SEEP Turbidity modular towbody assembled at Liquid Robotics headquarters. It covers final assembly and functional testing through the float and sub-payload.

3 RESPONSIBILITIES

It is the responsibility of manufacturing technicians to assemble the towbody as outlined in this document.

4 REFERENCES

- 03846 Assembly Drawing for SEEP Turbidity Towbody
- 070-04022 MPI, WET SECTION, TURBIDITY TOWBODY, 03848
- 070-04023 MPI, DRY SECTION, TURBIDITY TOWBODY, 03847
- 070-04024 MPI, TAIL SECTION, TURBIDITY TOWBODY, 01594
- 070-04026 MPI, NOSE SECTION, TURBIDITY TOWBODY, 03916
- Guide "How to Operate the Turbidity System Located in the Sub-Payload"

5 REQUIRED MATERIALS AND EQUIPMENT

- Torque driver with setting of up to 60 in-lbs
- Assorted metric bits for torque driver (Phillips, hex)
- Thread-locking compound Medium-Strength Loctite 243 (PN 01435)
- Silicone Spray Lubricant (PN 01857)
- Silicone Grease Dow Corning 111 (PN 01379)

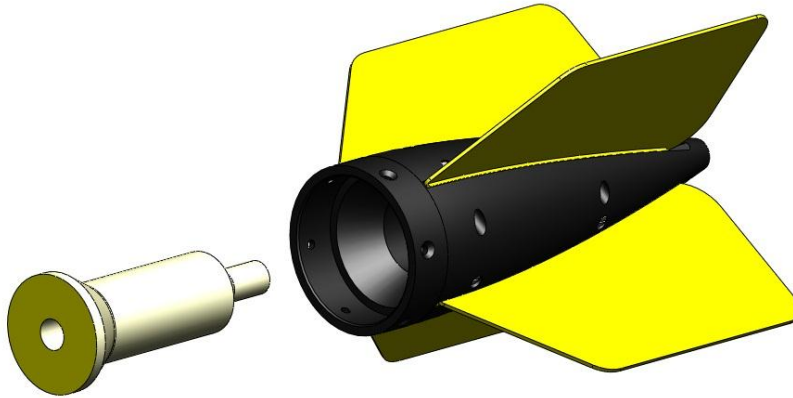
6 SAFETY REQUIREMENTS

NONE

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7 PROCEDURE

7.1 Insert Tail Foam (PN 01344) into the Tail Section (PN 01594)



7.2 Attach the Wet Section (PN 03848) to the tail section with the holes aligned and the ECO Puck oriented towards the bottom and then fasten in place using (6X) FHCS M5X16 Ti Screws (PN 02540-05-016). Apply Loctite 243 prior to installation and torque to 36 in-lbs.



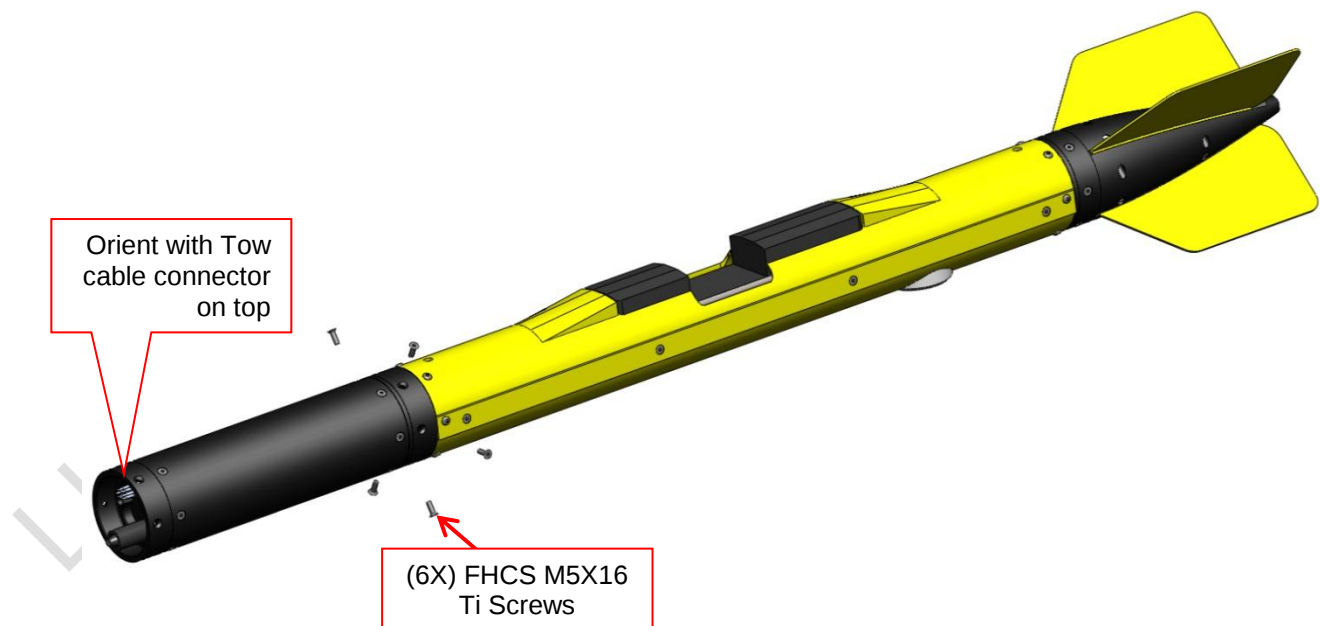
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- 7.3 Apply Silicone Spray Lubricant (PN 01857) to mating surfaces and then connect the C-Star and the ECO Puck cables to the rear bulkhead of the Dry Section (PN 03847). Hand-tighten each Locking Sleeve.



- 7.4 Attach the Dry Section to the Wet Section with the holes aligned and the tow cable subconn oriented on top and then fasten in place using (6X) FHCS M5X16 Ti Screws (PN 02540-05-016). Apply Loctite 243 prior to installation and torque to 36 in-lbs.

Note: It may be helpful to remove the Wet Section top shell to allow for additional management of the C-Star and Eco Puck cables while the bringing the two sections together.



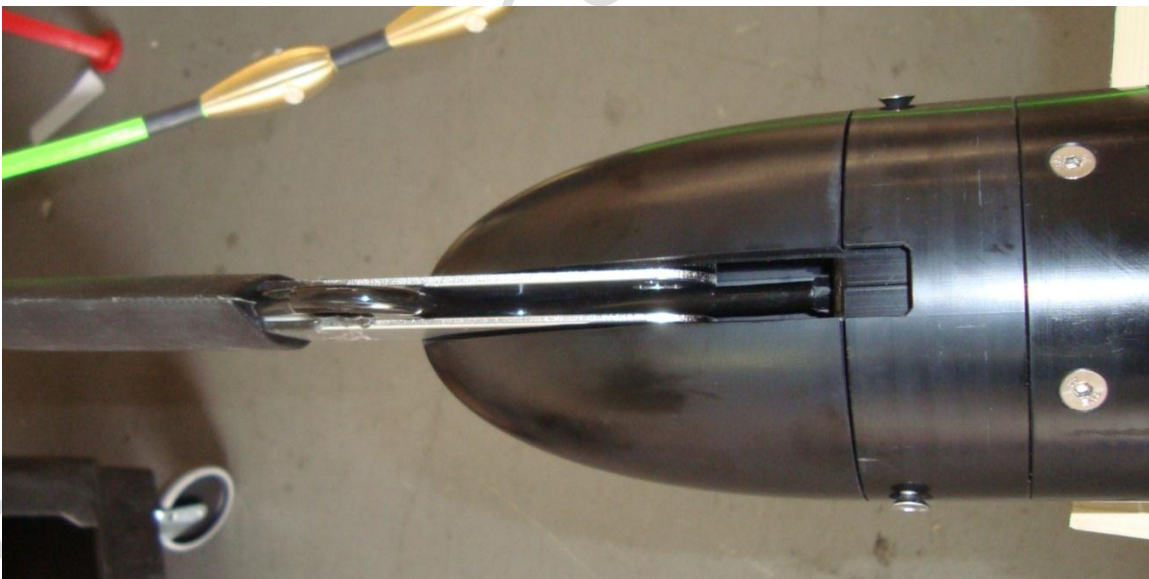
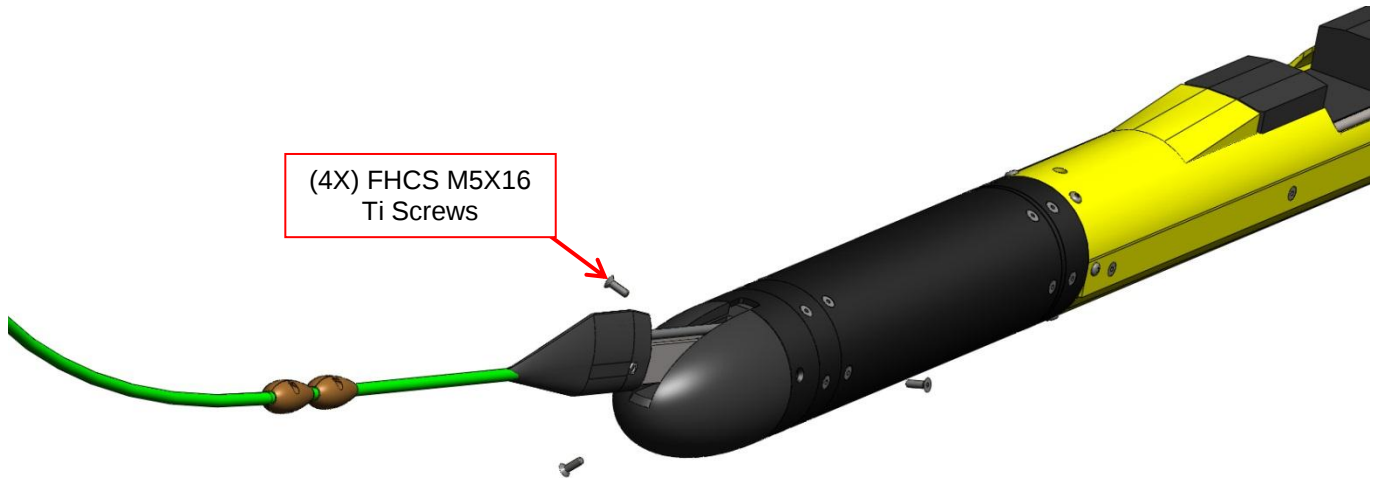
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- 7.5 Apply Silicone Spray Lubricant to mating surfaces and then connect the Tow Cable to the Dry Section. Attach the Nose Section (PN 04026) to the Dry Section with the holes aligned and then fasten in place using (6X) FHCS M5X16 Ti Screws (PN 02540-05-016). Apply Loctite 243 prior to installation and torque to 36 in-lbs.



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- 7.6 Attach the Nose Fairing PN (03913) to the nose section and then fasten in place using (4X) FHCS M5X16 Ti Screws (PN 02540-05-016). Apply Loctite 243 prior to installation and torque to 36 in-lbs. Include weight (PN 03081) separately.



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7.7 Functional Testing through WGMS (Refer to the “How-To” Guide for Turbidity System)

7.7.1 Connect the Towbody Towcable to the Sub-Payload connection.

7.7.2 Power on the Float.

7.7.3 In order for the Turbidity Sub-Payload to enumerate correctly, the sub-payload must be powered on before the payload to which it is connected is powered on, which in this case is Payload 1.

7.7.3.1 Turn on Sub Payload: Select Set Parameter -> Sub-Payload Power -> Check Box and Send. Wait for this command to ACK successfully before sending the next command.



Set Parameter Command - Google Chrome

gliders.wgms.com/dialogs/parameterdialog.aspx?orgid=1&VehicleId=506

Set Parameter Command

Send this command to SO 2004 1.

Default

Select Parameter: Add

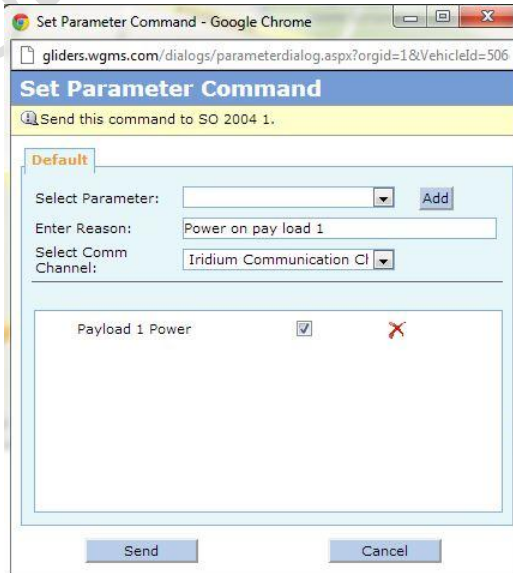
Enter Reason: Power on sub payload

Select Comm Channel: Iridium Communication CI

Sub Payload Power ☒

Send Cancel

7.7.3.2 Turn on Payload 1: Select Set Parameter -> Payload 1 Power -> Check Box and Send. Wait for this command to ACK successfully before sending the next command.



Set Parameter Command - Google Chrome

gliders.wgms.com/dialogs/parameterdialog.aspx?orgid=1&VehicleId=506

Set Parameter Command

Send this command to SO 2004 1.

Default

Select Parameter: Add

Enter Reason: Power on pay load 1

Select Comm Channel: Iridium Communication CI

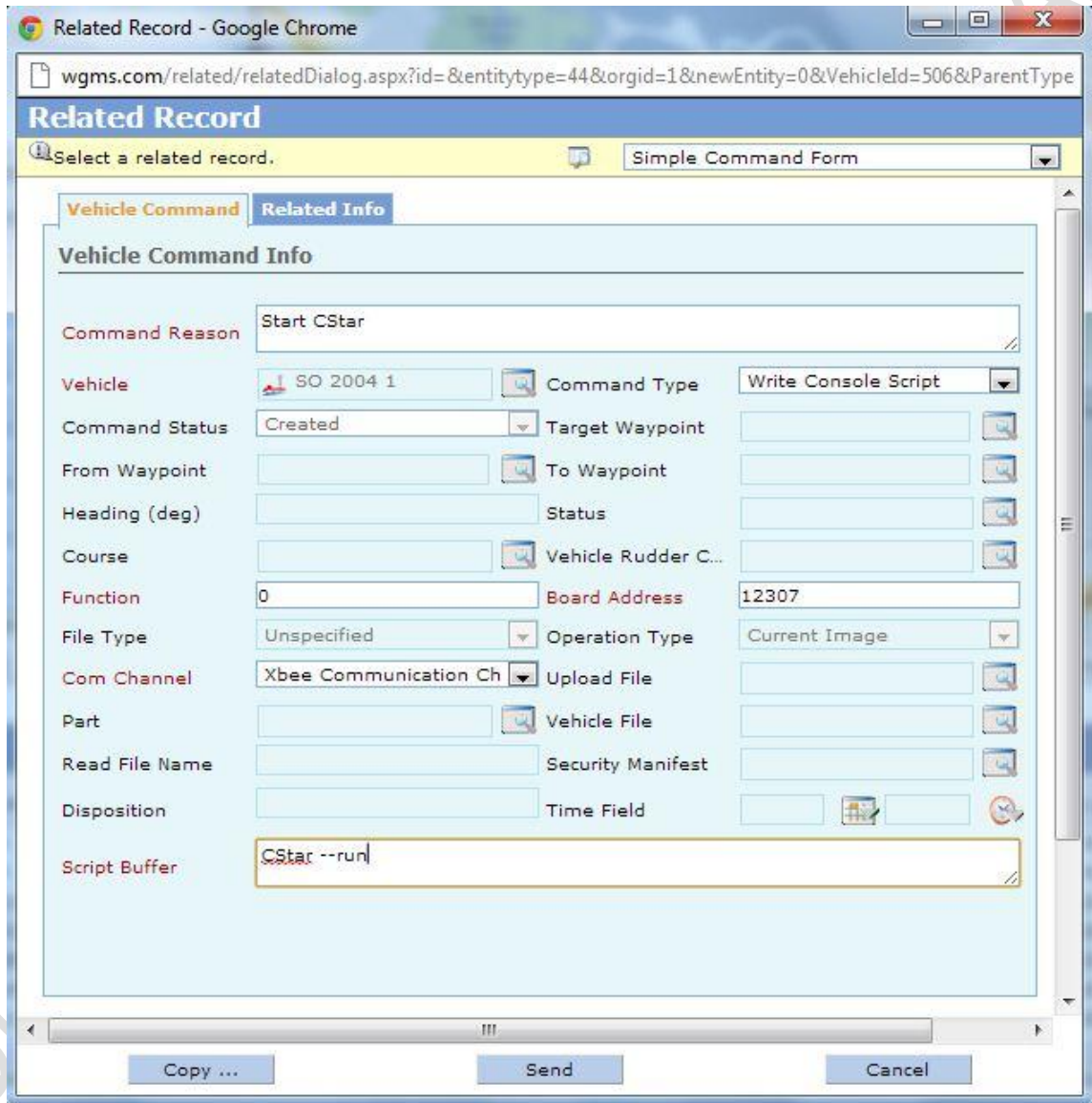
Payload 1 Power ☒

Send Cancel

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7.7.4 To enable the C-Star, execute the C-Star script to initialize it and begin sampling. Always verify the command has ACKED before sending additional commands.

More Commands -> Command Type: Write Console Script
Command Reason: Start C-Star
Board Address: **12307**
Script Buffer: CStar --run



Related Record - Google Chrome

wgms.com/related/relatedDialog.aspx?id=&entitytype=44&orgid=1&newEntity=0&VehicleId=506&ParentType

Related Record

Select a related record. Simple Command Form

Vehicle Command **Related Info**

Vehicle Command Info

Command Reason: Start CStar

Vehicle: SO 2004 1 Command Type: Write Console Script

Command Status: Created Target Waypoint:

From Waypoint: To Waypoint:

Heading (deg): Status:

Course: Vehicle Rudder C...:

Function: 0 Board Address: 12307

File Type: Unspecified Operation Type: Current Image

Com Channel: Xbee Communication Ch Upload File:

Part: Vehicle File:

Read File Name: Security Manifest:

Disposition: Time Field:

Script Buffer: CStar --run

Copy ... Send Cancel

7.7.5 Sample data for several minutes to confirm it is seen in WGMS.

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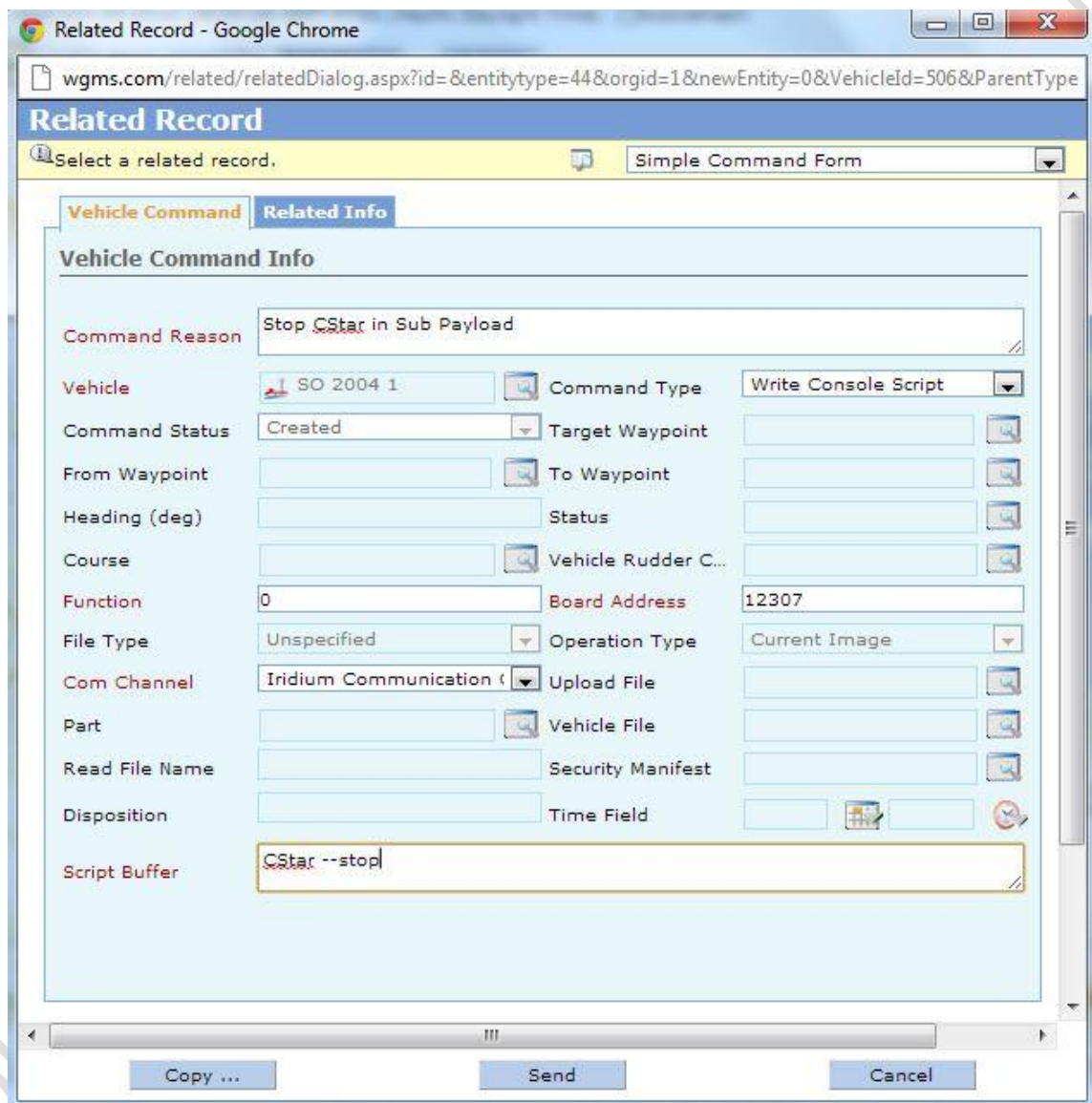
7.7.6 To Stop C-Start Sampling,

More Commands -> Command Type: Write Console Script

Command Reason: Stop C-Star

*Board Address: **12307***

Script Buffer: CStar -stop



Related Record - Google Chrome

wgms.com/related/relatedDialog.aspx?id=&entitytype=44&orgid=1&newEntity=0&VehicleId=506&ParentType

Related Record

Select a related record. Simple Command Form

Vehicle Command **Related Info**

Vehicle Command Info

Command Reason: Stop CStar in Sub Payload

Vehicle: SO 2004 1 Command Type: Write Console Script

Command Status: Created Target Waypoint:

From Waypoint: To Waypoint:

Heading (deg): Status:

Course: Vehicle Rudder C...

Function: 0 Board Address: 12307

File Type: Unspecified Operation Type: Current Image

Com Channel: Iridium Communication (Upload File:

Part: Vehicle File:

Read File Name: Security Manifest:

Disposition: Time Field:

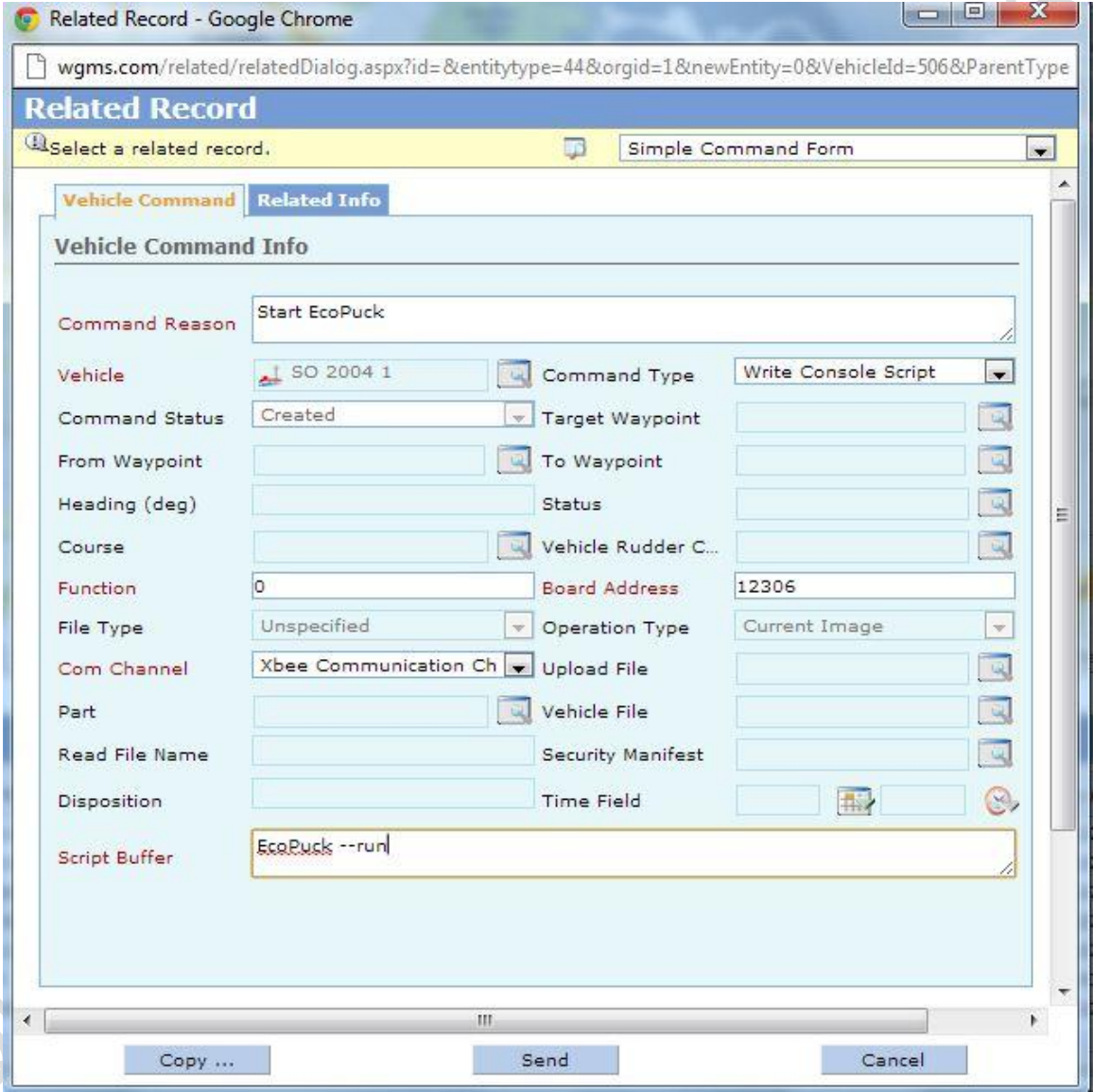
Script Buffer: CStar --stop

Copy ... Send Cancel

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7.7.7 To enable the Eco Puck, execute the EcoPuck script to initialize it and begin sampling. Always verify the command has ACKED before sending additional commands.

More Commands -> Command Type: Write Console Script
 Command Reason: Start EcoPuck
 Board Address: **12306**
 Script Buffer: EcoPuck --run



Related Record - Google Chrome

wgms.com/related/relatedDialog.aspx?id=&entitytype=44&orgid=1&newEntity=0&VehicleId=506&ParentType

Related Record

Select a related record. Simple Command Form

Vehicle Command **Related Info**

Vehicle Command Info

Command Reason: Start EcoPuck

Vehicle: SO 2004 1 Command Type: Write Console Script

Command Status: Created Target Waypoint:

From Waypoint: To Waypoint:

Heading (deg): Status:

Course: Vehicle Rudder C...:

Function: 0 Board Address: 12306

File Type: Unspecified Operation Type: Current Image

Com Channel: Xbee Communication Ch Upload File:

Part: Vehicle File:

Read File Name: Security Manifest:

Disposition: Time Field:

Script Buffer: EcoPuck --run

Copy ... Send Cancel

7.7.8 Sample data for several minutes to confirm it is seen in WGMS.

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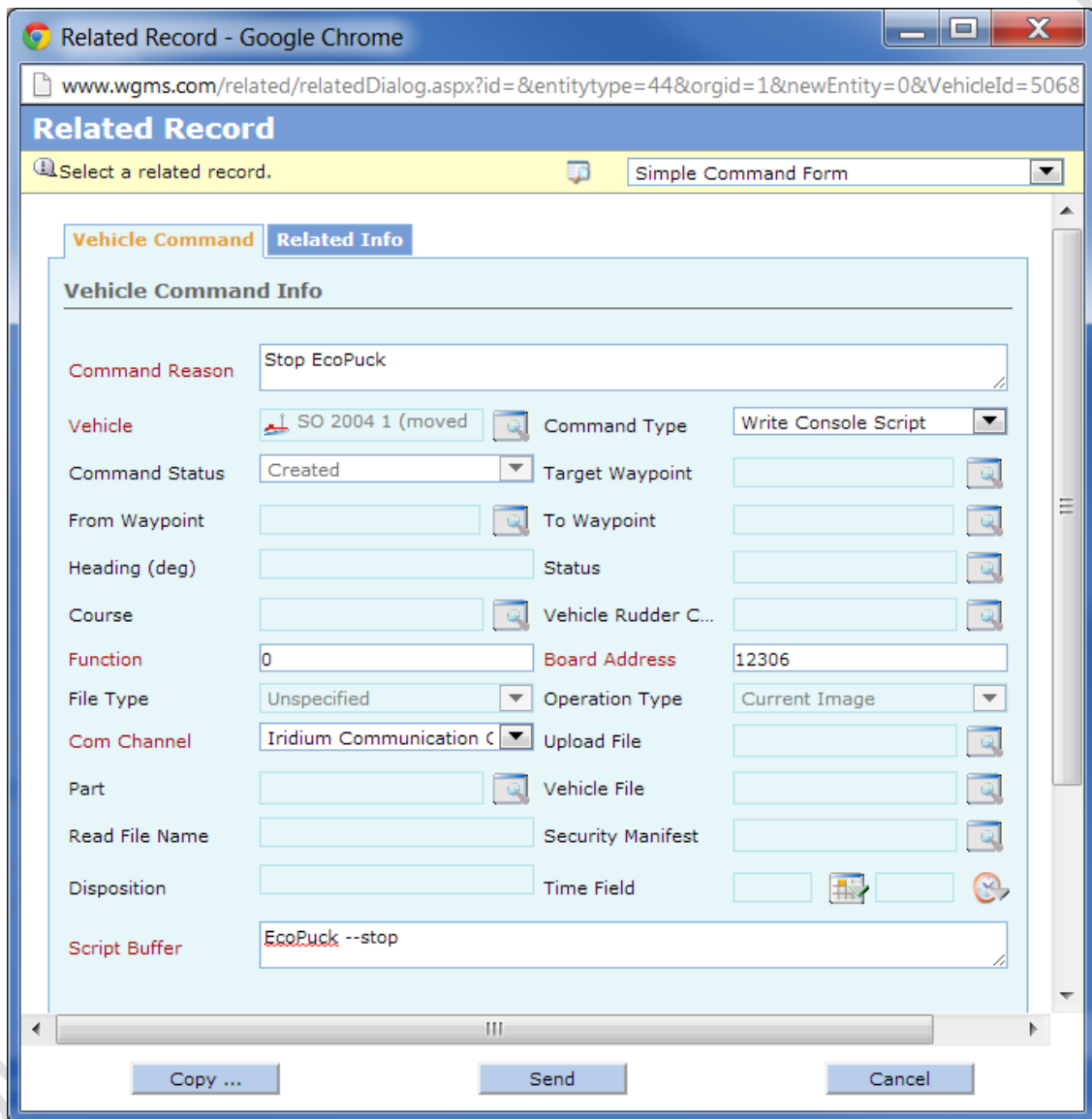
7.7.9 To Stop Eco Puck Sampling,

More Commands -> Command Type: Write Console Script

Command Reason: Stop EcoPuck

Board Address: 12306

Script Buffer: EcoPuck --stop



Related Record - Google Chrome

www.wgms.com/related/relatedDialog.aspx?id=&entitytype=44&orgid=1&newEntity=0&VehicleId=5068

Related Record

Select a related record. Simple Command Form

Vehicle Command Related Info

Vehicle Command Info

Command Reason: Stop EcoPuck

Vehicle: SO 2004 1 (moved) Command Type: Write Console Script

Command Status: Created Target Waypoint:

From Waypoint: To Waypoint:

Heading (deg): Status:

Course: Vehicle Rudder C...

Function: 0 Board Address: 12306

File Type: Unspecified Operation Type: Current Image

Com Channel: Iridium Communication C Upload File:

Part: Vehicle File:

Read File Name: Security Manifest:

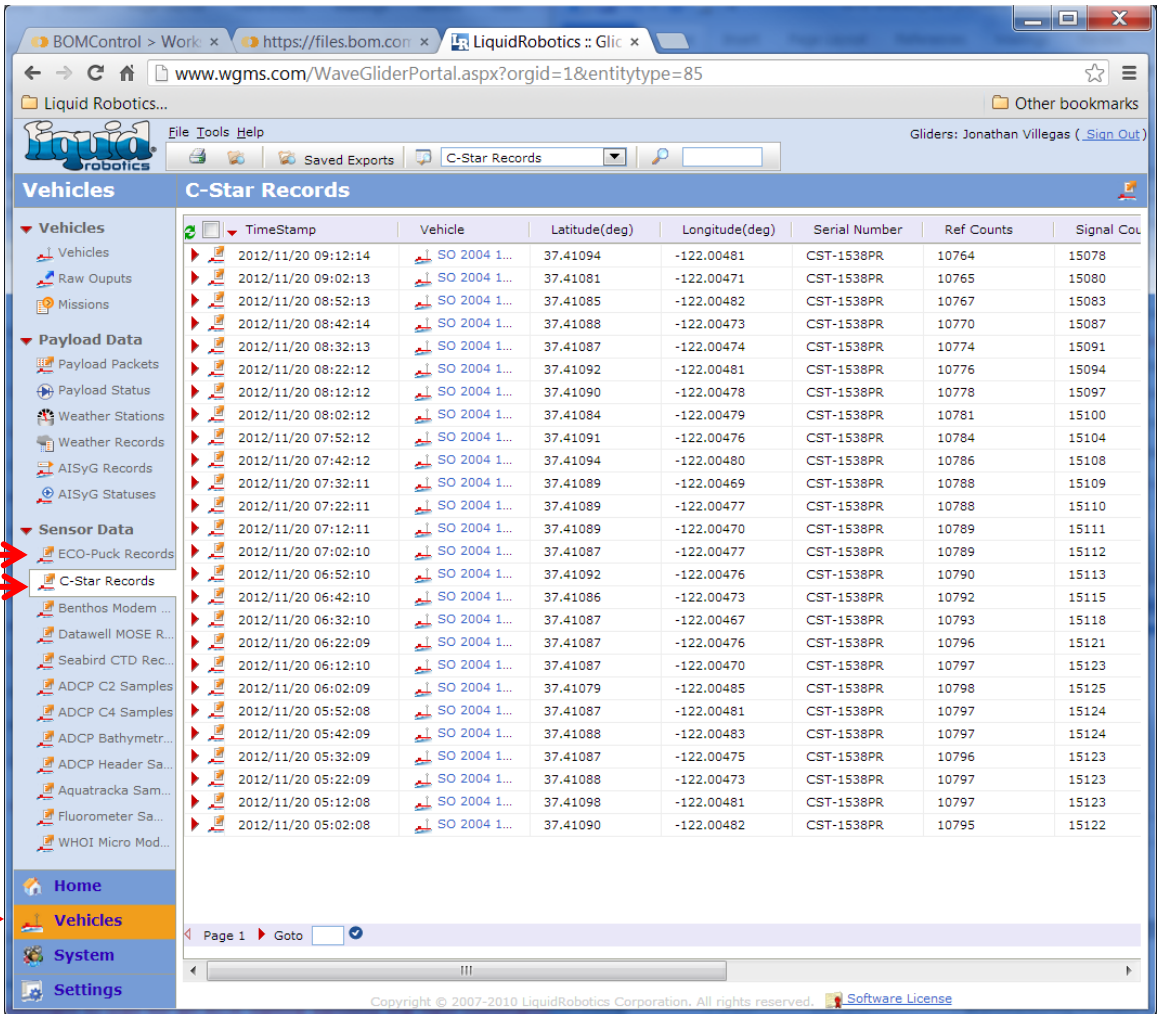
Disposition: Time Field:

Script Buffer: EcoPuck --stop

Copy ... Send Cancel

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7.7.10 To check C-Star and Eco Puck data in WGMS, navigate to the Vehicles page and under Sensor Data click on C-Star or Eco Puck.



The screenshot shows the WGMS web application interface. The left sidebar contains a navigation menu with the following items: Vehicles, Payload Data, Sensor Data, Home, Vehicles (highlighted), System, and Settings. The 'Sensor Data' menu item is expanded, showing a list of sensor types: ECO-Puck Records, C-Star Records, Benthos Modem, Datawell MOSE R..., Seabird CTD Rec..., ADCP C2 Samples, ADCP C4 Samples, ADCP Bathymetr..., ADCP Header Sa..., Aquatracka Sam..., Fluorometer Sa..., and WHOI Micro Mod... A red arrow points from the 'Eco-Puck and C-Star' text to the 'C-Star Records' item in this list. Another red arrow points from the 'Vehicles' text to the 'Vehicles' item in the main sidebar. The main content area displays the 'C-Star Records' table, which includes columns for TimeStamp, Vehicle, Latitude(deg), Longitude(deg), Serial Number, Ref Counts, and Signal Co. The table contains 20 rows of data, all for 'SO 2004 1...' vehicles. The bottom of the page shows a footer with 'Copyright © 2007-2010 LiquidRobotics Corporation. All rights reserved.' and a 'Software License' link.