OceanTRx7™

Maritime Stabilized VSAT System

Technical Note

Servo Driver

January 23, 2018

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COMMUNICATION WITHOUT BOUNDARIES

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Revision History and Control

Revision Level	Date	Responsible Person	Description of Change	ECO NO.
-	September 24, 2013	Albert	New Release	-
A	January 23, 2018	Albert	Update due to typo and content errors raised by AIRBUS	EC1800047

About this Manual

This manual is designed to guide you through the procedures required for maintaining the `SERVO DRIVER` for the OceanTRx7™ Maritime Satellite Communication System.

Text Conventions

Style	Indicates	Example
Text	Normal descriptive text	Contents
`Text`	Words or figures that appear on the screen or that should be typed The name of a file or directory	`System Status`
`<Text>`	A key to be pressed	`<ESC>`
`TEXT`	The name of a hardware component	`ANTENNA`
Text	The name of a GUI element	**Operation Screen**
➢	The description of a procedure	➢ **To configure…**

Notations

	Indicates important information that should be noted.
	Indicates a potential hazard.
	Indicates the safest method of installation or an operation that *must be adhered to.*

Effective Releases

This document is effective for both OrBand™ and OceanTRx7™ Maritime Satellite Communication Systems.

For a description of the changes between OrBand™ and OceanTRx7™, refer to the *OceanTRx7™ Maritime Satellite Communication System Release Notes*.

Table of Contents

1 Introduction

1.1 Purpose

The purpose of this Technical Note is to provide detailed instructions on how to replace and verify `SERVO DRIVER` operation.

1.2 Servo Driver Description

Each axis is dynamically positioned by its own SERVO DRIVER and SERVO MOTOR as directed by the ACU. Separate incremental encoders are attached to both the motor and the axis itself – the former for driver commutation and the latter for dynamic axis-position feedback. The POLARIZATION SKEW AXIS contains a single encoder on its motor.

The ACU sends positioning coordinates to the SERVO DRIVERS which convert them into positioning commands. These commands are sent to the SERVO MOTORS. As the motors move the ANTENNA into position, the AXIS ENCODERS on each of the PEDESTAL axes return actual ANTENNA location in a closed position loop.

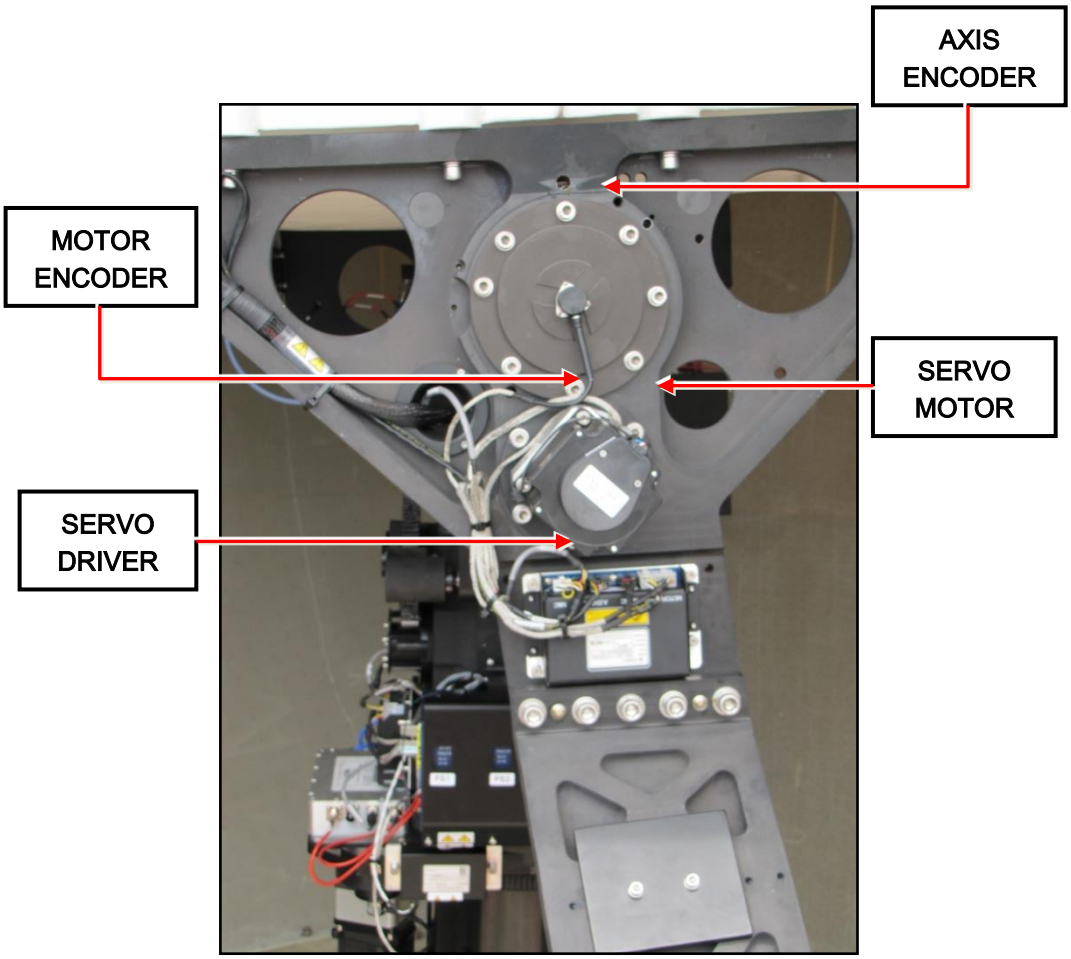


Figure 1-1: Servo Subsystem (Elevation Axis)

When system power is shut off, a dynamic braking relay arrests movement of the PEDESTAL, locking the axes in their current position. In cases when it is necessary to rotate a given axis for maintenance purposes, a mechanical switch on the servo driver of each axis overrides the lock and allows free movement of that axis.

The SERVO DRIVER connects to the other SERVO SUBSYTEM components via its connectors.

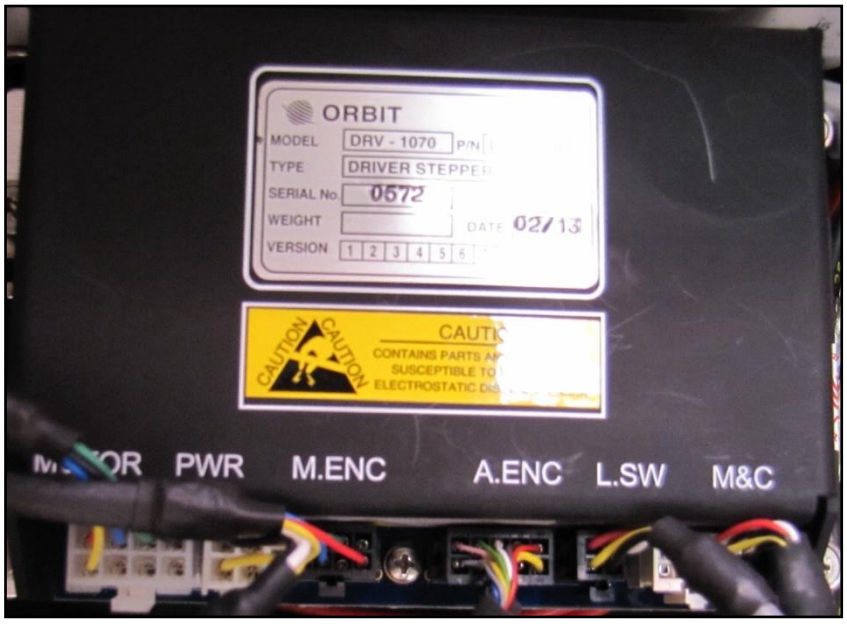


Figure 1-2: Servo Driver Connectors

The following table describes each connector.

Table 1-1: Servo Driver Connectors

Connector	Type	Function
MOTOR	8-pin	Connects to the SERVO MOTOR phases
PWR	4-pin	Connects to the POWER SUPPLY to receive DC power
M. ENC	8-pin	Connects to the MOTOR ENCODER
A. ENC	10-pin	Connects to the AXIS ENCODER
L. SW	4-pin	Connects to the HALL SENSOR
M&C	8-pin	Connects to the ACU

1.3 Spare Kit Contents

The following table provides a list of the parts in the `SERVO DRIVER` spare kit.

Table 1-2: Spare Part Kit Contents

KIT32-1664-004-SP		
P/N	**Description**	**Quantity**
K01000057	PKG BOX 160x130x100	1
L00107002	AXIS STEPPER DRIVER 10A	1

1.4 Required Tools and Parts

The following table provides a list of tools and customer-supplied parts that are needed to perform the procedures in this Technical Note.

Table 1-3: Required Tools and Parts

Tool/Part Name	Notes	Figure
Medium Phillips screwdriver		
Tie cutter		

2 Preliminary Procedures

➢ **To Perform Preliminary Procedures:**

The preliminary procedure described below must be performed before replacing the SERVO DRIVER:

1. Open the RADOME hatch.
2. Switch off the ADE POWER BOX at the ANTENNA PEDESTAL base (located inside the RADOME).
3. Toggle the SERVO DRIVER MAINT/OPER switch on the servo driver to MAINT position to release the brake and allows smooth movement of the axis .
4. Manually rotate the PEDESTAL AXES to gain convenient access to the serviced unit.

In the following procedures, be very careful when tightening and loosening the screws with which the parts are assembled and attached to the system. Some of these screws are delicate and can be damaged by excess force. When using an Allen key make sure to insert the key all the way into the screw head to avoid thread stripping.

WARNING!

The Utility Outlet is connected directly to the vessel's AC voltage input terminals (125 VAC / 250 VAC). Therefore, there still exists live voltage at the Utility Outlet after disconnecting the power supply to the ADE using the Mains Power On/Off Switch.

Only qualified and authorized personnel are allowed to carry out system service/maintenance procedures.

3 Replacing a Servo Driver

3.1 Removing a Servo Driver

➢ **To Remove a Servo Driver:**

Step 1

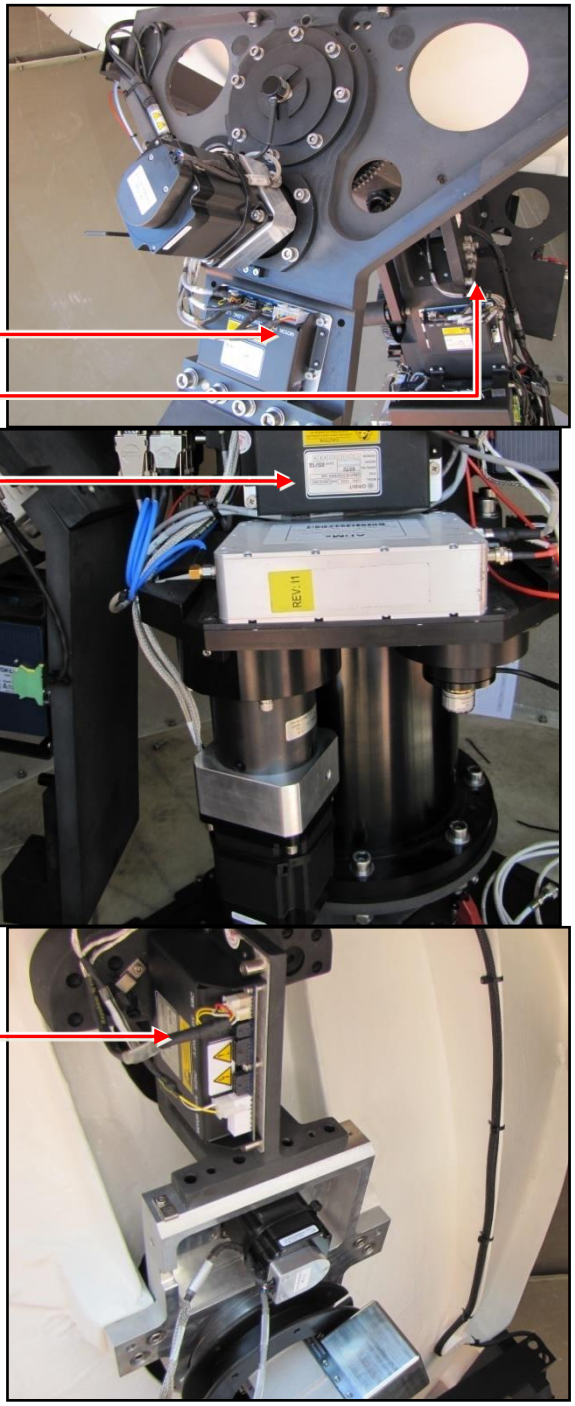
Locate :

The ELEVATION SERVO DRIVER.

The TILT SERVO DRIVER.

The AZIMUTH SERVO DRIVER.

The POLARIZATION SKEW SERVO DRIVER.

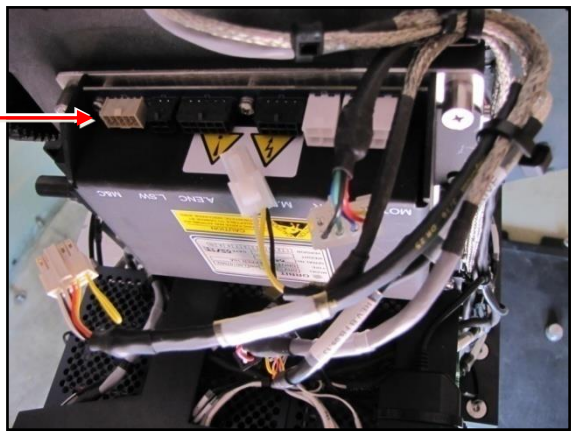


All four SERVO DRIVERS

Are identical.

Step 2

Disconnect all cables from the SERVO DRIVER connectors.



driver's wiring is delicate

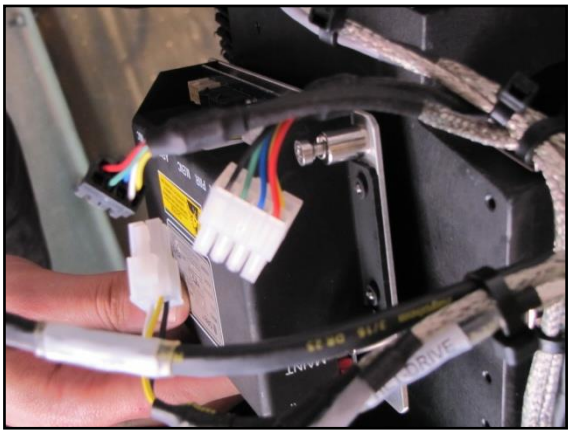
Do not pull cables wires

Step 3

Use a Phillips screwdriver to loosen the four captive Phillips screws securing the SERVO DRIVER to its mounting plate.

Step 4

Remove the SERVO DRIVER.

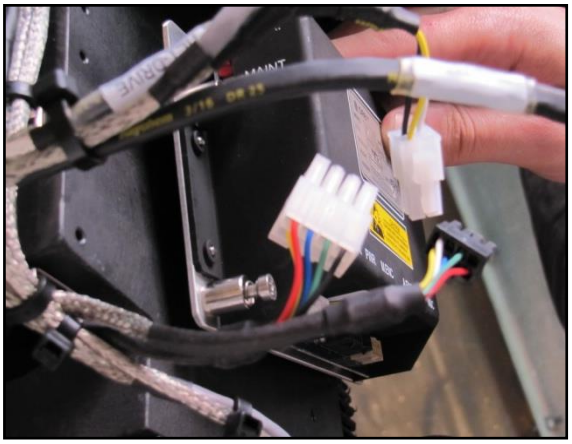


3.2 Installing a Servo Driver

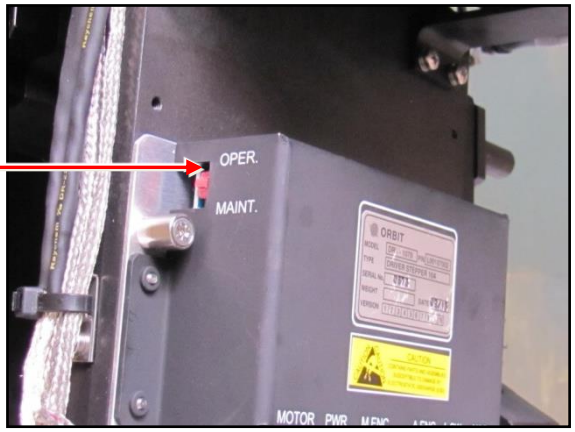
➢ **To Install a Servo Driver:**

Step 1

Mount the new SERVO DRIVER on the PEDESTAL AND secure it using a Phillips screwdriver.



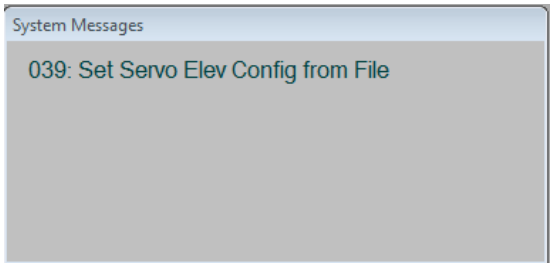
Verify switch set to: **OPER**.



4 Software

4.1 Verify Servo driver installation

1. Switch on the ADE power switch. Leave the Radome. Observe startup sequence
2. Wait until the CCU establish ADE-BDE communication. Check system messages
3. If WRN 083/128/141/154 (No communication with Servo Driver) display check cable connections
4. Message 037/039/041/043 will appear on the system message window. It is normal. The message will clear on next antenna reboot



5. If WRN 011/012/013/013(Improper servo XXX SW version), appear you need to upgrade system software version to latest revision.

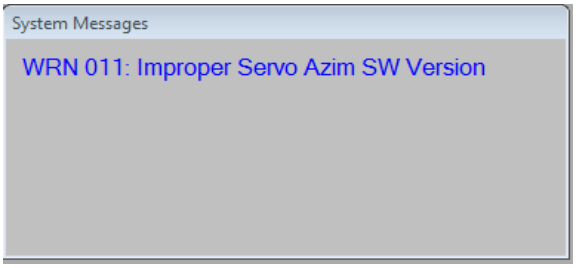


Figure 4-1improper Servo driver version

IMPORTANT

Message 037/039/041/043 (Set Servo xxxx Config from file) will appear after servo driver change to indicate the ACU has updated the Servo Driver set of parameters according the system ID. The message will clear on next reboot

4.2 Updating the System Software

1. Launch MtsDock application.
2. Copy the software package file in zip format on USB flash drive
3. Select **ThisHost** menu and chose **General Software Update**...
4. The **Select ZIP Archive with Software Updates** dialog box appears

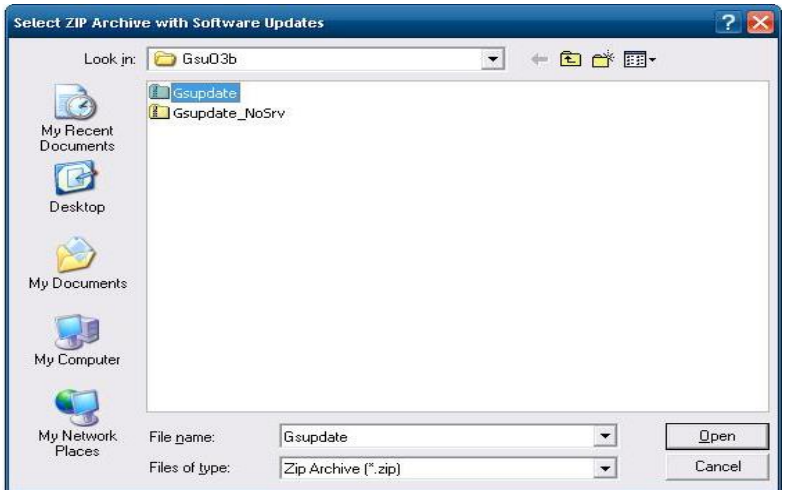


Figure 4: Select ZIP Archive with Software Updates **Dialog Box**

5. Select the software package file form the browser
6. Click **Open (Enter)**. New dialog box will pop up ask to enter the IP address of the system units. Remove the checkbox from ACU3 and CCU2 i

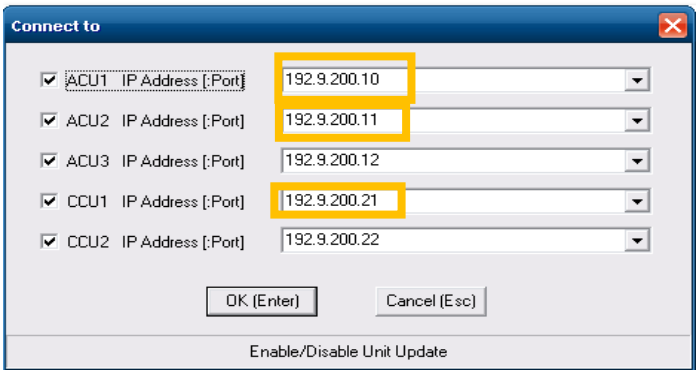


Figure 4: Connect ACU, CCU Message Box

The example dual system update

In case of single system uncheck the ACU/CCUs

7. Click OK (Enter). The automated upgrade process will start. It will update the ACU (VSATWORKS) executable, CCUs MTSVLINK and the Servo Driver software
8. After the process is completed the system will issue reboot prompt. Confirm by **OK**.

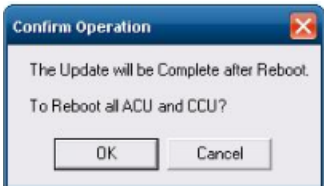


Figure 2 Reboot prompt

9. When communication is established between the ACU and the CCU
10. Click the **Version** command on the `MTSLINK` Menu Bar or press E
11. . Verify that the new version and matches the software version used by the `CCU`.
12. Verify WRN 011/012/013/013 doesn't display

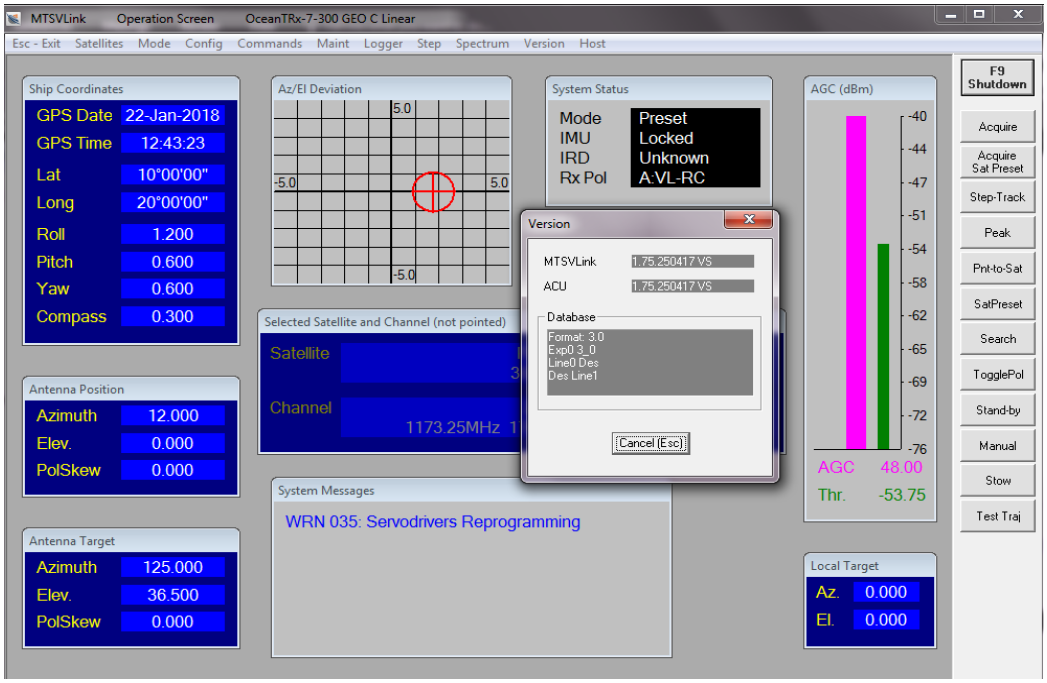


Figure 4: Mtslink Software details

WRN035: ServoDrivers Reprograming will be displayed on the system messages window for 2-3 minutes. The system continue to operate normally after the message clear

5 Performing Verification Test

➢ **Follow the procedure below to verify the repair:**

After the SERVO DRIVER has been replaced, perform the following test procedures to verify system functioning

1. Start up the system (see the *OceanTRx7™ Installation and Operation Manual*).
2. wait until WRN 035 clear and click on **Test Traj.**
3. Make sure no error messages appear in the **System Messages** window.