AOML Auto-launcher & SEAS2K data acquisition software

User manual
V 1.1
October 18th, 2007

Hardware setup

Hardware list

1. Auto-launcher

- MK21 card in powered USB box (MK21 USB box).

MK21 USB box and USB cable.

MK21 power source.

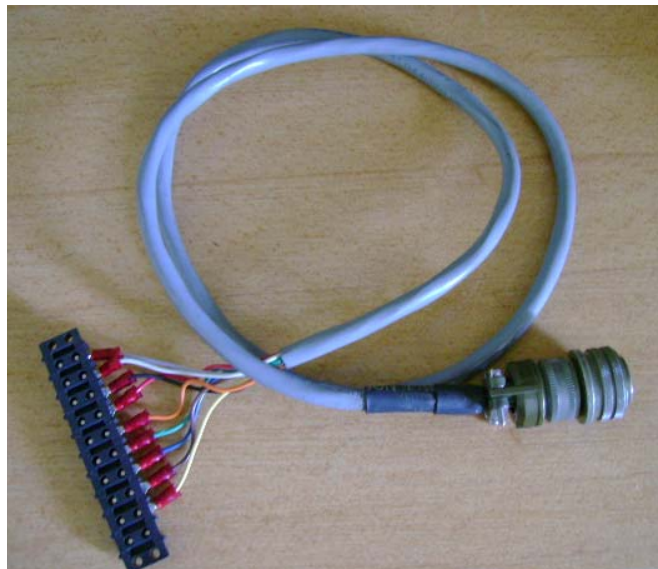- AOML auto-launcher (AL) controller box (silver box).

AL controller box

- Serial cable

- 8 shooter auto-launcher.

AOML 8 shooter auto-launcher

- AL cable connector.

AL cable connector to AOML silver box

- AL cable.

- Hand-launcher.

- Test probe.

2. Computer

- Shuttle computer.

- Shuttle flat screen monitor.

- Keyboard.

- Mouse.

3. Transmitter and GPS

- Thrane & Thrane (T&T) transciever with antenna and power adaptor.

- 2 serial cables for GPS streaming and data transmission from/to T&T transceiver to/from SEAS2K.

- (Optional) Trimble GPS plus antenna and power adaptor.

- (Optional) serial cable for GPS streaming from Trimble GPS to SEAS2K.

Hardware setup

4. Considerations before starting hardware setup:

The following three considerations should be kept in mind before and during the set up:

4.1. MK21 USB box must be on before any other hardware component

MK21 USB box should be set up with all power OFF. Then, in step **9.3** the MK21 USB box must be started before anything else. This assures that no voltages enter the MK21 USB box while it is off. This has been known to damage MK21 cards.

#### 4.2. Keep MK21 USB cable unplugged during hardware setup.

Do not connect the MK21 USB cable to the computer during this step of the setup process. Specific instructions on how to plug the USB cable are provided during the step 3 (Hardware Startup) in order to make sure the MK21 USB box is recognized by the computer.

4.3. Delay auto-launcher setup until software is up and running

Always leave the AL setup (step 8) until after SEAS2K is up and running. Test the connection between the AL and SEAS2K with the AL inside the cabin. Once the connection is tested and the XBT test probe is run (step 11.4), then proceed to the deployment of the cable and the mounting of the AL on the stern.

5. Antennae installation

This is the first actual step towards hardware setup. Mount the GPS and T&T antennae on the bridge railings with hose-clamps. Make sure the location does not interfere with the normal operations of the vessel; ask the chief mate if your mounting is acceptable.
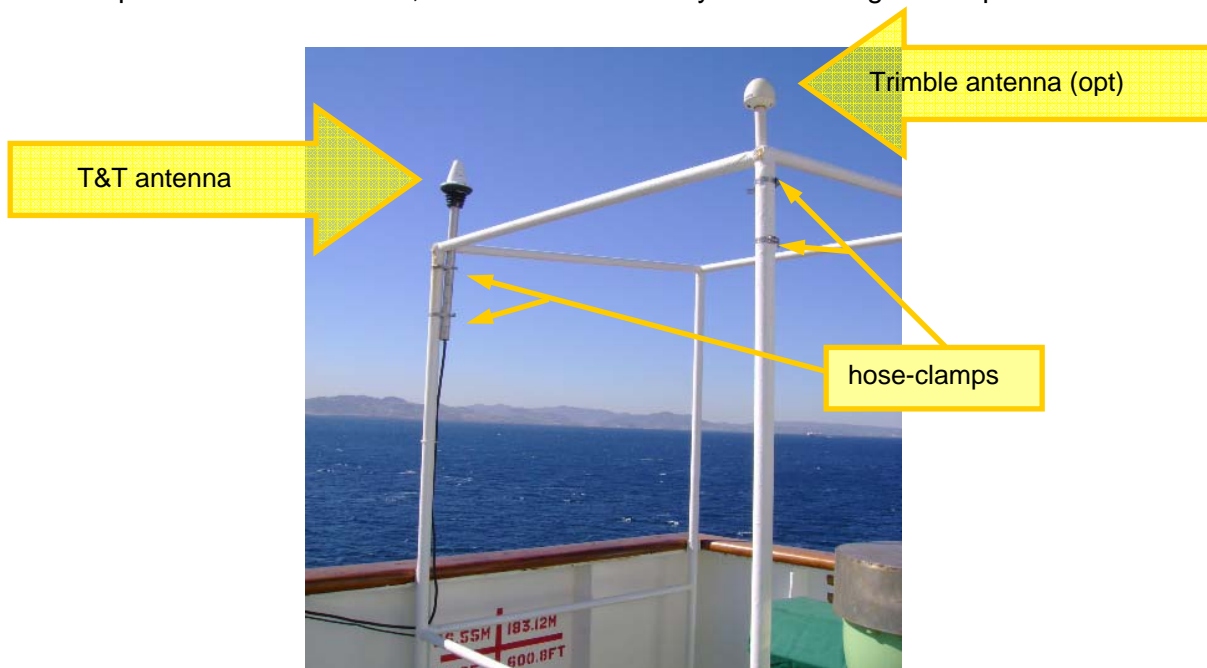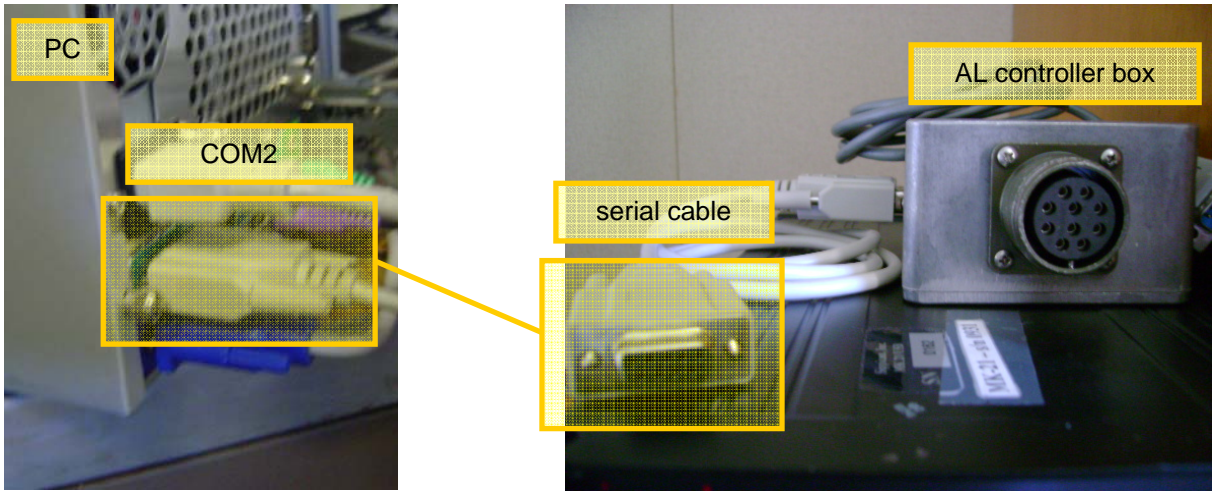

Run the antenna cables to your cabin window, tie-wrapping neatly, and out of the way.

6. Inside the cabin

> *Computer, MK21 USB box, Thrane & Thrane transceiver, and AOML AL controller box must be off at all times.*

6.1. Plug AOML AL controller box into the PC's COM2 port using an adequate serial cable.
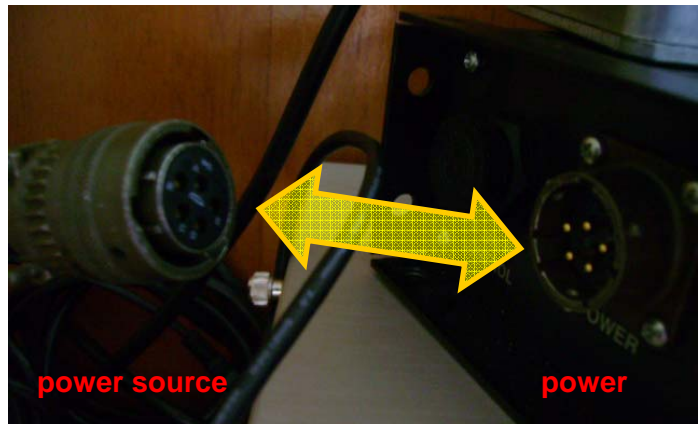

6.2. Plug Thrane & Thrane DTE and I/O ports into the PC's COM1 and COM3 ports, respectively, using adequate serial cables.

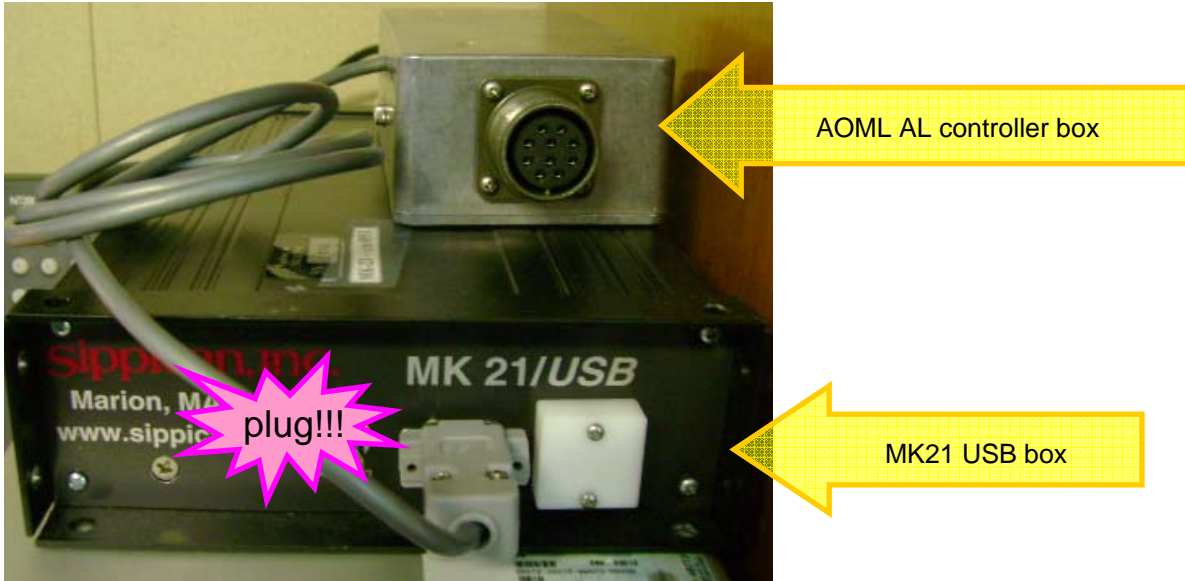**6.3.** Make sure the MK21 USB box is off. Plug it to its power source as shown in the following picture:

MK21 USB box power source

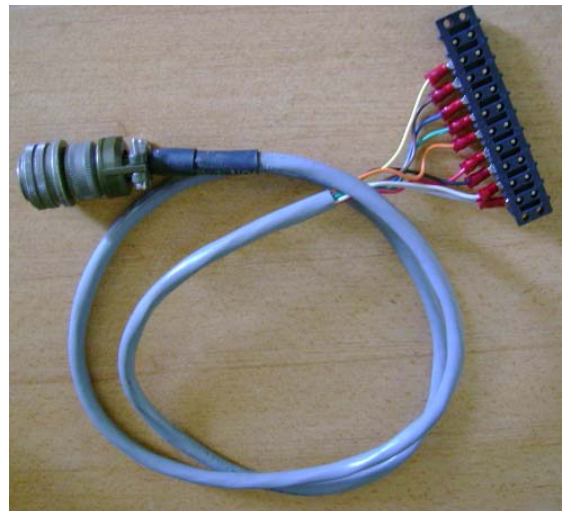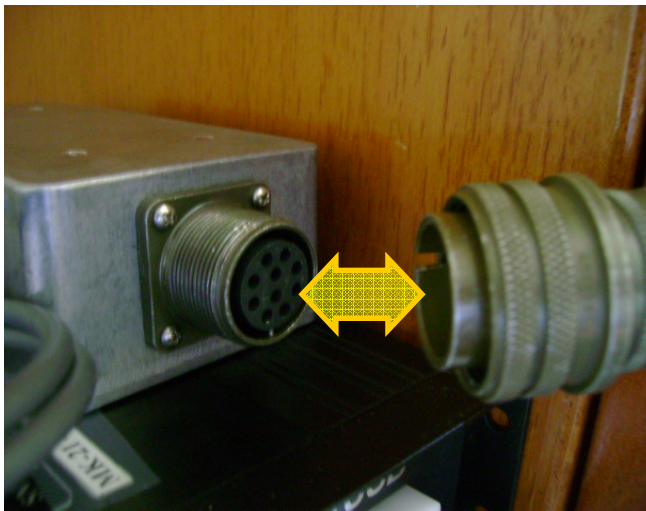Detail of power cable connection to the MK21 USB box.

6.4. Plug the MK21 box to the AL controller box (silver box).

AOML AL controller box

MK21 USB box

plug!!!

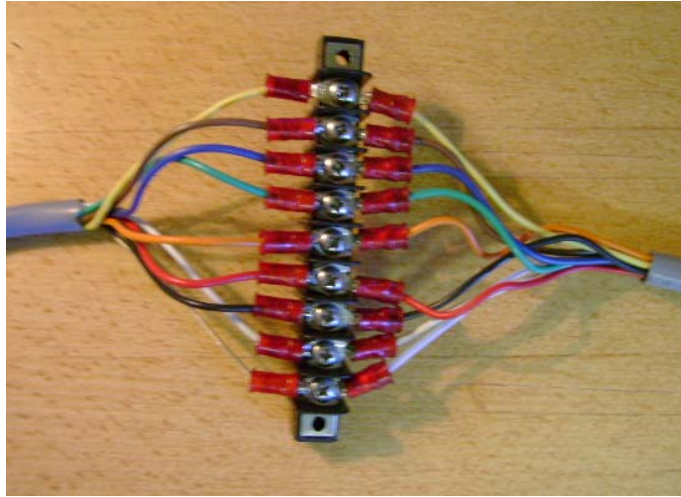*Leave the MK21 USB cable unplugged. Do not connect it to anything at this time.*

7. Auto-launcher setup (cabin side)

7.1. Connect the AL controller box to the AL cable connector.

AL cable connector

7.2. Connect the AL cable connector with the AL cable by matching their colors:

8. Auto-launcher setup (stern side)

8.1. Run the AL cable from the cabin to the stern

First run the AL cable (probably the best would be to string it going aft) paying out from the porch outside your cabin. Feed it thru the holes in the railing – or secure with tie-wraps going aft.

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*Make sure the cable will remain out of the way of **ANY** anticipated ship operation.*

Mount the aluminum pipe on the railing where you think it will be most of the time downwind. In the case of a flat railing top, mount the flat plate secured with C-clamps.

[Include pictures of aluminium pipe mounted on the stern railing and picture of flat plate secured with C-clamps]

Mount the AL's base to the AL with the 7/16 wrench and nut driver. The downward angle of the AL should be just enough to allow an XBT to slide out (about 20 deg.)

[Include picture of AL's base showing proper inclination]

Slide the AL rig onto the pipe (you may have to rotate the AL to shoot more downwind in heavier weather- about 30 deg. maximum). In the case of a flat railing top, slide the AL rig onto the pipe attached to the flat base.

8.2. Open the junction box, put the cork and sealing nut onto the end of the AL cable.

[Include picture of junction box showing how it has to be sealed with the cork]

Screw down the terminals tightly – color to color – inside the junction box and seal the box and cable fittings tightly. Tie-wrap the cable and the junction box.

8.3. Ground the AL to the ship's hull. There are several ways to do this:

- Hose clamp the ground cable terminal to the railing.
- Bolt the AL ground cable terminal to a hole in the hull.
- Attach the ground cable terminal to the hull using a C-clamp.

[Include picture of proper grounding surface prepared with a file]

*Always make sure both contact surfaces are cleaned to **BARE** metal. Use a file if necessary. A good ground is very important for a proper AL operation.*

Notes:
- If there is no protective cover for the auto-launcher you may have to rinse salt off occasionally.
- Spray the AL's pins with W24D every two days to prevent them from getting stuck.

Hardware startup

9. Hardware startup sequence

9.1. Start with computer, MK21 USB box, and AL controller box off.

9.2. Make sure the AOML auto-launcher controller box is plugged into the PC's COM2 port.
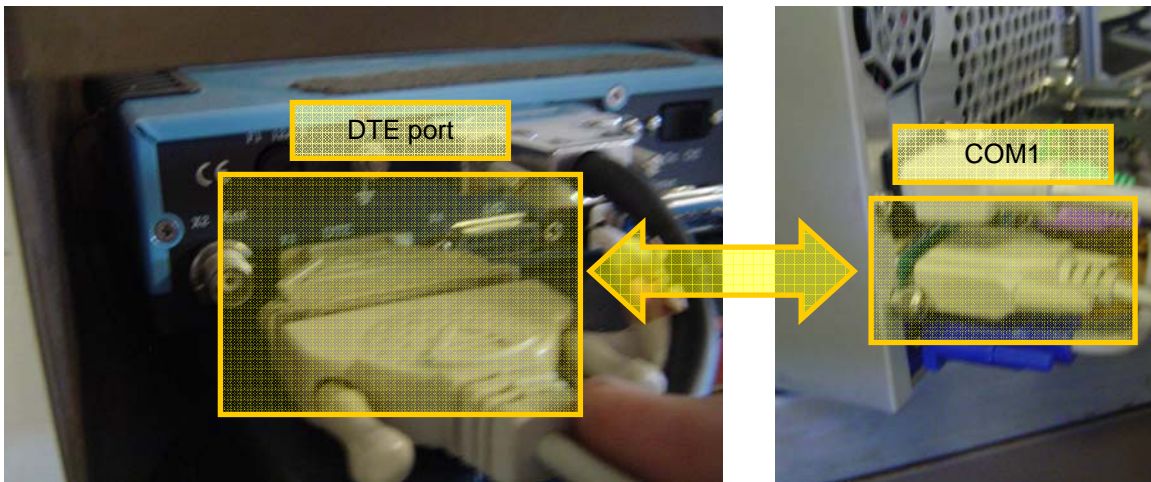
Follow the order of the steps below carefully:

9.3. Power the MK 21USB box up.

9.4. Power the AL controller box up.

9.5. Power the T&T transceiver up.

9.6. Make sure T&T transceiver DTE and I/O ports are plugged into the PC's COM1 and COM3 ports, respectively.

9.7. Power the computer up and log on.

9.8. Plug the MK21 USB cable into any of the computer USB ports.

9.9. Restart the computer. The computer will not recognize the MK21 unless it is restarted with USB cable plugged in.

Running SEAS2K

Software startup

10. Starting SEAS2K up

> *When the PC starts up it should automatically run SEAS2K. Identify the SEAS2K main screen among all open windows. Start SEAS2K if no windows are open.*

The operation of AOML's Auto-launcher is supported by functionalities under these two menus only.
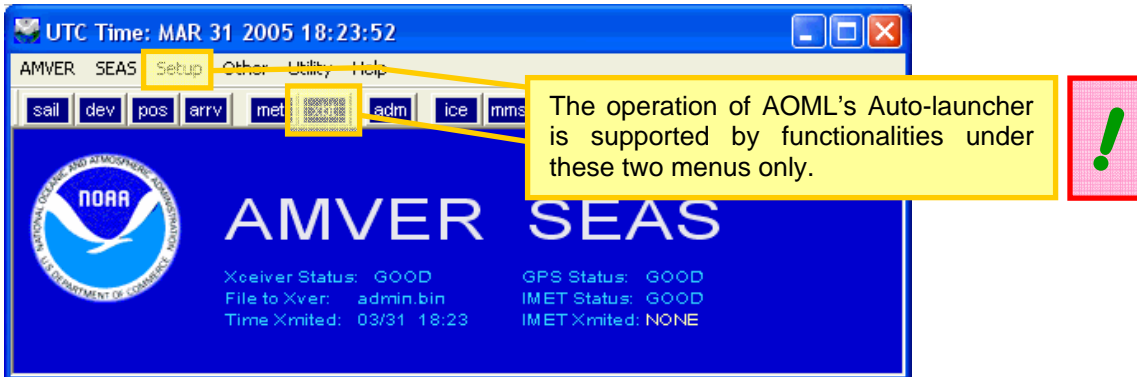
10.1. Time zone check

For proper operation of AMVER/SEAS, the computer time and time zone must be set correctly to (GMT) **Casablanca Monrovia** time. Once the computer time zone is set correctly, it should not be changed.

Make sure the time zone is Casablanca/Monrovia.
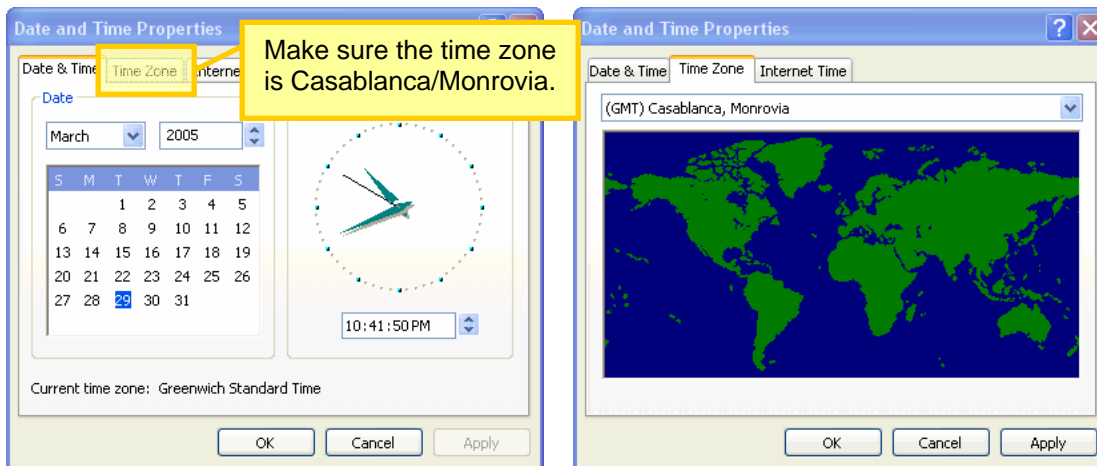
10.2. Ship call sign check

The ship call sign must be entered in the administration screen for proper real-time transmission of XBT profiles. Go to the **Setup | Administration** menu in the main SEAS2K screen to open the following screen:

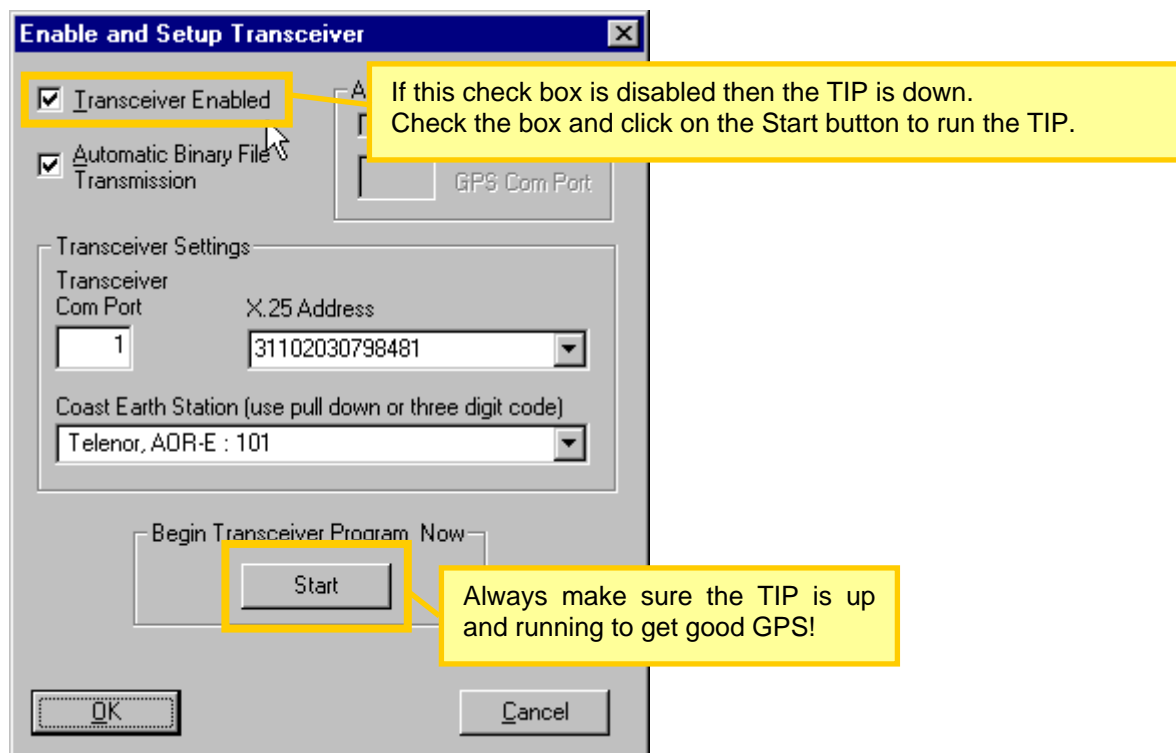## 10.3. GPS streaming port check

[ask Janet where is this port configured in SEAS2K]

Generally, this option indicates the PC's COM port where the serial cable from AOML's AL controller box is plugged into (see details in step 6a.).

10.4. Transceiver interface program (TIP) start up

This program acts as a go-between for SEAS2K and the transceiver. The TIP has two functions:
- Transmission of binary XBT profile data via the transceiver through PC's COM1 port.
- GPS streaming to the Time server. The TIP reads GPS data from the transceiver through the PC's COM2 port.

This function is critical for the Time server to get good GPS positioning. Always check that TIP is up when starting up SEAS2K. If the TIP is not started automatically when SEAS2K starts, go to the **Setup | Transceiver** menu on the SEAS2K main screen to enable and start it.

Enable and Setup Transceiver

☑ Transceiver Enabled

If this check box is disabled then the TIP is down.
Check the box and click on the Start button to run the TIP.

☑ Automatic Binary File Transmission

GPS Com Port

Transceiver Settings

Transceiver
Com Port   X.25 Address

   1   31102030798481

Coast Earth Station (use pull down or three digit code)

Telenor, AOR-E : 101

Begin Transceiver Program Now

Start

Always make sure the TIP is up and running to get good GPS!

OK   Cancel

Make sure that the Transceiver Com Port is set to 1.

10.5. Time server: GPS positioning and time check

Identify the Timeserver screen among all open windows in the screen and make sure both boxes are checked to have good GPS streaming to SEAS2K. If the Timeserver screen is not available go to the main SEAS2K screen and select the **Setup | Time Server** menu to start this program up.
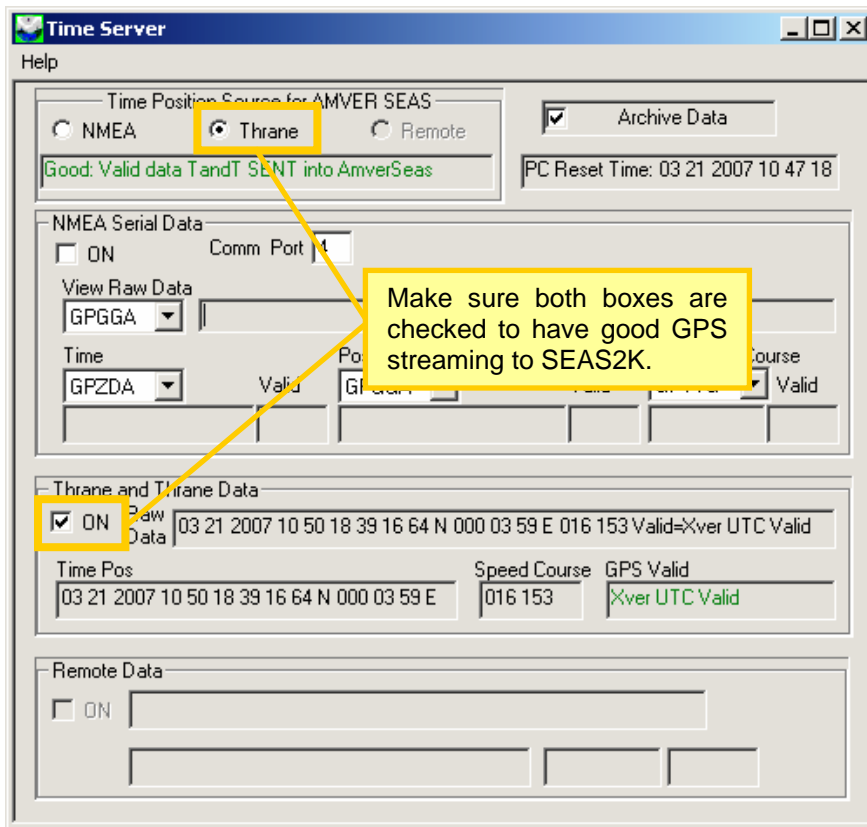
11. Running SEAS2K XBT at the beginning a cruise

> *Open the SEAS2K XBT screen from the **SEAS | XBT** menu in the main SEAS2K screen. From now onwards all operations will be controlled from this screen.*

11.1. Configuration

Go to the **Setup | System | System Configuration** menu. Fill blanks as necessary. Select **Automatic Transmit** checkbox. Under query reduction, select **save binary file without question**, and select **No** for mandatory input of serial number.

11.2. Auto-launcher COM port check

Go to **Setup | AutoLauncher | Setup** on the SEAS2K XBT screen and make sure the Auto Launcher COM port option is set to 2. This option sets which PC's COM port is used to communicate with the Auto-launcher.

AOML Auto Launcher Setup

Number Of Tubes   8

Launcher Tube Sequence   1 2 3 4 5 6 7 8

Auto Launcher Com Port   2

☑ Enable Electrical Check of Tubes

OK
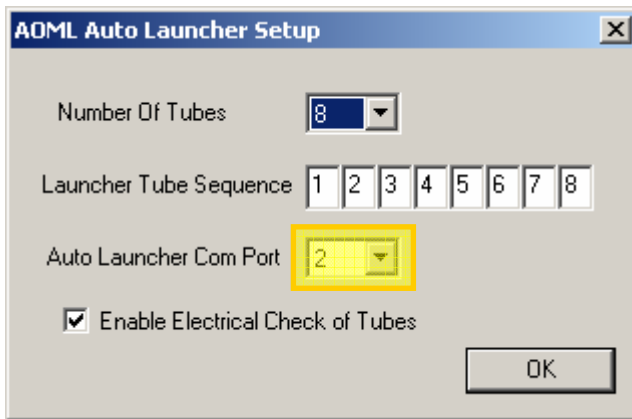
11.3. Auto-launcher connection check

To test that all connections with the AL are properly working, go to **Setup | AutoLauncher | Diagnostics** on the SEAS2K XBT screen. Select the **Status Message** option in the drop down menu. Click the Send button to send the message to AOML's auto-launcher. If the connection with the AL is properly setup, the status message should appear in the response box.
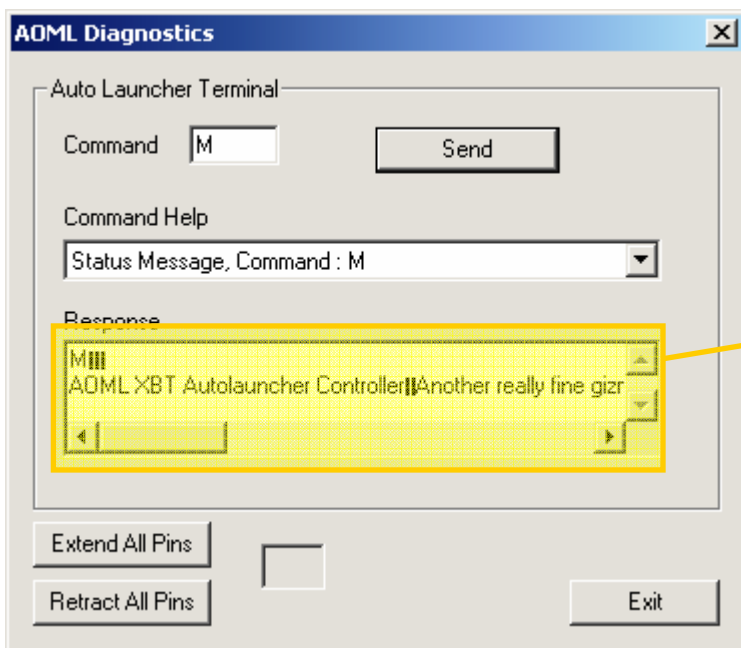
If the connection with the AL is properly setup, the status message should appear in the response box.

11.4. MK21 connection check using XBT test probe

Load the XBT test probe in the AL. Click **Begin Manual AL** on the SEAS2K XBT screen toolbar. Select the appropriate tube number and run the test profile. After SEAS2K goes trough the launch sequence you should see a constant 9°C profile on the screen.

If the test probe drop runs successfully then all your hardware and software is properly setup. Congratulations! Just a few extra steps will be needed to have SEAS2K ready to start your cruise.

*It is now the moment to mount the AL on the stern and deploy the AL cable following the instructions in step **8. Auto-launcher setup (stern side).***

11.5. Drop plan setup

Drop plans are setup either on a position-basis or on a time-basis. Position based drop plans are useful when non-homogeneous or specific sampling locations are required (i.e. near boundaries). Consequently position based drop plans take longer to setup since each sampling location needs to be defined on it.

To setup a position based drop plan go to the **Setup | Drop Plans | Position** menu In the SEAS2K XBT screen.

Use this option to retrieve a previously used drop plan.

Position based drop plans can be defined by latitude or longitude.

Drop locations will be listed here.

Make sure to activate your drop plan!

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Time based drop plans are useful when homogeneous sampling is required (i.e. open ocean). Time based drop plans are faster to setup since just the time spacing between drops is required. A constant ship speed is required for this time based drop plans to ensure homogeneous sampling in distance. Whenever the ship speed changes considerably, +/- 1 knot, adjust the time sampling by setting a new drop plan.

To setup a position based drop plan go to the **Setup | Drop Plans | Time** menu In the SEAS2K XBT screen.

For instance, for sampling every 50km and ship speed of 19 knots, then drops must be every 1h 25 min.

Make sure to activate your drop plan!

11.6. Start an Auto Launcher cycle

Click on the **Begin AL Cycle** button in the SEAS2K XBT screen and the AL will now drop XBTs according to the selected drop plan.

11.7. Load the auto-launcher with XBTs

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11.8. Reset tube status in SEAS2K

Reset the tubes in SEAS2K by going to the **Report | Launch Status** menu. SEAS2K will electrically test each XBT loaded on the AL and

The reset process may take a few minutes. Once it is completed, the tubes indicators should appear either green or red. Green tubes are ready to be launched. Red tubes failed the electrical check. Check that the lid is properly closed in the AL and try again.

Software operation

12. Running SEAS2K XBT during a cruise

12.1. View the status of good drops by going to the **Report | Launch Status** menu. This screen is useful to see the upcoming drops based on the selected drop plan. This is a very useful screen and may be kept open while dropping.

12.2. Drop outside a drop plan.

First stop the Auto Launcher by selecting the **End AL Cycle** button in the SEAS2K XBT screen toolbar. Select either **Begin Hand Lnch** to drop an XBT with the hand launcher connected to the controller box or **Begin Manual AL** to make a single drop with the AL. After the drop is done, do **step e** above and turn the AL back on by selecting **Begin AL Cycle** button (SEAS2K will offer the option to re-engage the AL once the manual drop is finished).

12.3. Profile transmission

You can verify that a drop was transmitted by looking at the Transceiver Interface window.

Hardwarwe/software troubleshooting

[TBD]