



SOFTWARE ISSUE IN APOS VERSIONS 4.24.0 TO 4.27.1

Introduction

A software issue in APOS has been discovered regarding updating the HiPAP program with the correct new mean sound velocity after a new sound velocity profile has been added to APOS. For APOS versions 4.24.0 (where this was introduced) to version 4.27.1 (where it was fixed) APOS must be restarted to update the HiPAP Program with the correct mean sound velocity.

HiPAP Sound Velocity Compensation

For HiPAP 501, 351, 101 and uPAP systems, there are (on each computer directly connected to the transceiver) two programs that are involved in calculating the position of a transponder.

The HiPAP program does all signal processing on the raw data collected by the transducer head. HiPAP calculates an angle and a range to the transponder in relation to the transducer head by applying beam forming, and estimate the time of arrival. The travel time is then multiplied by the mean sound velocity to achieve a range. HiPAP will transmit this position to APOS.

The APOS program compensates for the ray bending and refines the range estimate based on the position received from HiPAP. APOS will convert the range to the transponder back to travel time, using the same mean velocity as the HiPAP Program has used.

From here, APOS will step through the sound velocity profile, starting at the measured angle of the signal and continue through the profile to where the travel time states that the transponder is located. The APOS sound velocity compensation algorithm has been compared to known scientific software to verify its accuracy, and performs as well as these programs.

Explanation of the discovered issue

The software issue in this case is that when a new sound velocity profile has been added to APOS, the mean sound velocity of this new profile was not transmitted to HiPAP. This results in an error in the conversion that APOS does to calculate the travel time of the signal.

Solution

Whenever APOS is started, the mean sound velocity will be updated in HiPAP as part of the initial setup. Therefore, until APOS is upgraded to version 4.27.1 or later, the solution is to restart APOS whenever a new sound velocity profile is added to the system.

Multiple OS systems

The safest way to ensure that everything will be correct after rebooting, is to shut off all but one OS, add the profile to this system, and then start up the other OS's. These OS's will load the new profile from the first one which is Master. The profile must be added before the first OS is rebooted.

APOS Survey

For USBL, this does not affect the position on the APOS Survey OS. That is, the vessel APOS can be an affected version, but the USBL on the Survey system will be correct. If LBL is used on the APOS Survey OS, then the vessel APOS should be restarted when a new profile is added or ideally upgraded.

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