Collaboration with NOAA and Kongsberg for KMALL Handling

BY ANDREW CLOS

A PARTNERSHIP IS FORMED

Hello Fellow HYPACK® Users,

Lately, Hannah Marshburn and I have been working with some former NOAA colleagues to test HYPACK® 2022 on one of their 29-foot survey launches. Hannah was formerly a Survey Technician on NOAA Ship *Fairweather*, and I was a NOAA Corps officer who specialized in hydrography. The survey launch pictured below is moored at NOAA's Marine Operations Center - Pacific (MOC-P) in Newport, Oregon, and is primarily used to test autonomous operations and serve as a fleet spare. NOAA operates 10 survey launches like this one from three different ships in the fleet. This survey launch is equipped with a Kongsberg EM 2040 multibeam echosounder (MBES) and an Applanix POS MV.

The collaboration began when NOAA's Hydrographic Systems and Technology Programs (HSTP) liaison reached out to Kongsberg and HYPACK to determine if they'd be able to use the latest version of Kongsberg's Seafloor Information Systems (SIS) software with HYPACK® on the installation of a new EM 712 sonar system aboard the NOAA Ship *Fairweather*. Since Hannah and I both live in Newport, Oregon, this easily accessible test platform has proven to be quite convenient.

NOAA Survey Launch 2902, moored alongside MOC-P, Newport, Oregon

TESTING BEGINS

Building upon a previous group effort between HYPACK, Kongsberg, and University of New Hampshire (UNH) personnel late last year, we have been able to test the latest versions of HYPACK® (2022) and SIS software (5.9.3) and collect multibeam data in the Yaquina River.

Check out this Sounding Better article about the UNH results: HYPACK & Kongsberg KMALL Driver with SIS 5.6| Caryn Zacharias

NOAA vessels, moored on the Yaquina River, Newport, Oregon

RESULTS ARE ACHIEVED

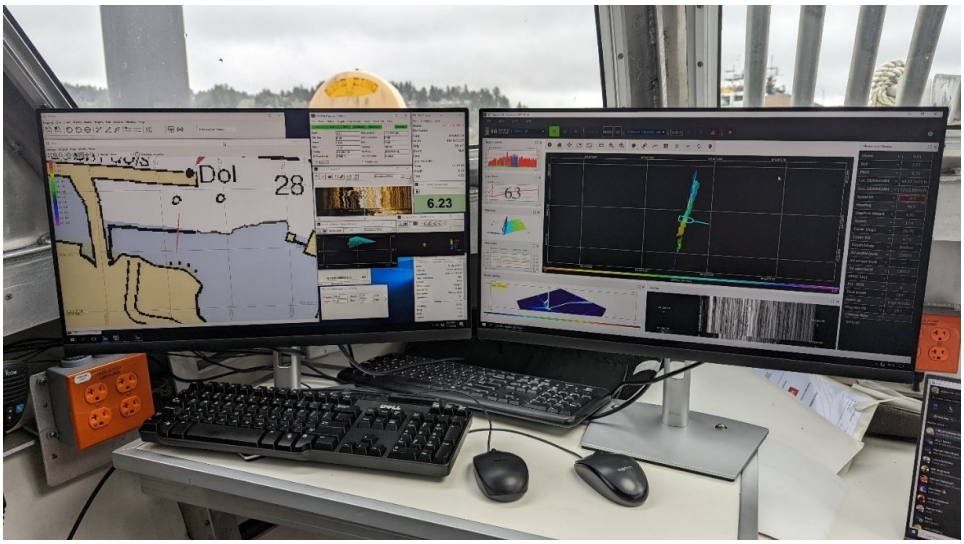
Before I "launch" into more detail, I am happy to say that we have a working system! HYSWEEP® receives, displays, and records the incoming multibeam data from SIS 5.9.3 in the KMALL data format.

The launch computer had previously been used on another NOAA survey vessel, so it had HYPACK® 2017 and HYPACK® 2021 installed. We initially performed the Q2 update to HYPACK® 2021, and while we were able to get everything communicating, we encountered numerous display glitches that went away once we upgraded to a fresh version of HYPACK® 2022 - don't forget to update your software!

Unexpected matrix behavior when using old software versions with new drivers

Following the guide in the Sounding Better article mentioned above, we were able to get the UDP and UDP multiport methods working using the "Kongsberg KMALL" driver in HYPACK®. With a few small datasets in hand from a few days of testing, we were able to identify and fix some timing issues and are now seeing good looking data when comparing HSX files with their KMALL counterparts.

Corrected matrix and timing issues lead to properly functioning systems



WORK CONTINUES

We still have more work to do. Although we were able to get both UDP methods working, we still have not had success seeing data in HYSWEEP® via TCP connection. We have started to dig in deeper with a packet analyzer and will get to the bottom of the issue soon. Fortunately, this type of troubleshooting won't require any underway time and can be done while the boat remains at the pier.

Additionally, we occasionally find that the UDP broadcast from the Kongsberg SIS computer stops without an apparent cause. Resuming the UDP transmission requires powering off and then restarting the SIS computer. The Kongsberg SIS computer, HYPACK® computer, and Applanix POS M/V are all attached to the same network switch, and the POS M/V continues to output its UDP messages without interruption when this issue occurs. We are putting our heads together to determine the root cause and are committed to fixing the issue whether it be hardware-related or tied to HYPACK® or Kongsberg software. I expect several more sessions on the boat with a packet analyzer and debugger.

Finally, since Launch 2902 is not used daily as a survey vessel, I should have the freedom to experiment with new features and bug fixes. I firmly believe in trying to break the software you just wrote to tease out all of the bugs. Having a platform like the NOAA launch should allow me to catch bugs more efficiently and test features more effectively. I am looking forward to being able to continue this mutually beneficial relationship and hope that its benefits will positively impact all HYPACK® users.

THANK YOU

We would like to express our sincere gratitude to NOAA and Kongsberg for their ongoing help in making these tests possible. Although we can simulate data moving through our software, there is no substitute for hands-on access to a complete survey platform. Throughout the process, NOAA's personnel have been accommodating my requests to get the boat underway and have graciously allowed frequent access to the boat while it is alongside. Kongsberg technicians and engineers have been responsive and cooperative throughout the process as well, so we thank them for their time and expertise.

Safety briefing on the back deck of Launch 2902. Led by LTJG Michael Card (right).

Happy Surveying,

Andrew Clos