

20th CHRIS MEETING
Niteroi, RJ, Brazil, 3-7 November 2008

Paper for Consideration by CHRIS

Canadian position regarding CHRIS19-06.1C – Recommendations for Consistent ENC Data Encoding

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| Submitted by: | CA, Canadian Hydrographic Service (CHS) |
| Executive Summary: | This paper presents the Canadian position on proposed SCAMIN recommendations. |
| Related Documents: | CHRIS19-06.1C, November 2007 |
| Related Projects: | |

Introduction / Background

In November 2007, CHS implemented the CHS SCAMIN Harmonisation Pilot Project in order to assess the implications and usefulness of the IHO/IC-ENC recommendations as outlined in CHRIS19-06.1C, November 2007, for the application of SCAMIN on Canadian Electronic Navigational Charts (ENC). CHS contracted and tasked IIC Technologies Inc. with performing the necessary modifications to 6 Trans-boundary ENC datasets using CHS existing production environment CARIS HPD.

Detailed metrics were collected for each of the new process steps as well as issues encountered and potential solutions through the duration of the project. This information will be helpful in determining the feasibility of the SCAMIN application for Canada's large ENC portfolio. A detailed description of all process steps has been documented such that the processes can be repeated in the future, if necessary.

The results of the pilot project were then forwarded to regional Multi-disciplinary Hydrographer ENC experts. The general consensus is that the IHO recommendations fall well short of the expectations that our MHDs have when applying SCAMIN to Canadian ENCs.

The Canadian Hydrographic Service (CHS), in consultation with mariners and Canadian regional experts, believes that the IHO/IC-ENC recommendations for the application of SCAMIN on ENCs does not improve Canadian ENCs, and may adversely affect the usability of CHS products.

Canada agrees that ENCs should strive to be consistent across portfolios and international boundaries, and Canada views these recommendations as a valuable first step in achieving such consistency, especially for HOs that have yet to implement a SCAMIN solution. However, the Canadian implementation of SCAMIN goes beyond the minimum recommended values as set in CHRIS19-06.1C and IC-ENC. Canada believes this to be in line with the spirit of the IC-ENC recommendations.

The IHO SCAMIN recommendations greatly increase the amount of screen clutter at small

scales on CHS ENC's. The mariners interviewed overwhelmingly supported the CHS implementation of SCAMIN over the IHO recommendations. Mariners felt that the increase in screen clutter, especially an overabundance of redundant soundings at small scales, made for a confusing picture and was deemed unnecessary at those scales. At these small scales, mariners felt that, for route planning purposes, the use of colour to represent depths was more than sufficient. Mariners also believe that the aids to navigation should be exempt from SCAMIN as it may constitute a risk to safety of navigation, and should be available to the mariner at all times.

At navigationally significant larger scales, the mariners could not detect an appreciable difference between the CHS and IHO SCAMIN implementations and were quite satisfied with both presentations.

The consensus among the mariners interviewed is that the IHO recommendations fall well short of the expectations that users have when using Canadian ENC's at small scales. The IHO recommendations adversely increase screen clutter on CHS products and may pose a risk to safety of navigation due to the inclusion of navigational aids in the new SCAMIN schema.

Summary of IIC Task

Over the course of the CHS SCAMIN Harmonization Pilot Project, IIC has utilized both CARIS HPD 2.5 and ECDIS to accomplish the following five primary tasks:

- 1.) Analyze current SCAMIN of both Canadian and US trans-boundary ENC's in ECDIS with screen captures at various display scales.
- 2.) Develop SCAMIN scripts in accordance to IC-ENC SCAMIN Proposal as outlined in CHRIS19-06.1C -19th CHRIS Meeting in Rotterdam, Netherlands on 2-5 November 2007 for use in CARIS HPD to populate SCAMIN values.
- 3.) Import CHS source datasets and carry out all data processing activities, such as: re-scheming according to IHO recommendations as outlined in Circular letter CL 47/2004, edge-matching, and applying SCAMIN scripts.
- 4.) Export the resulting new versions of ENC products from the database without while preserving data content and integrity (i.e. the Dkart error logs for database derived products should be no different than those generated from the source ENC's).
- 5.) Compare and analyze SCAMIN values in the original and the newly created ENC datasets and document all findings in project report.

Metrics were kept for each step in the process, and issues encountered during the execution of the project were documented along with potential solutions. Finally, a description of how to import ENC's, create seamless data, apply SCAMIN and generate ENC products was documented so that others can repeat the process.

In general, a process was designed, documented, and executed to successfully fulfill the above primary goals

CHS Analysis:

The results of the pilot project were forwarded to regional Multi-disciplinary Hydrographers and ENC experts. The general consensus is that the IHO recommendations fall well short of the expectations that our MHDs have when applying SCAMIN to Canadian ENC's. The IHO recommendations adversely increase screen clutter and may pose a risk to safety of navigation due to the inclusion of navigational aids in the new SCAMIN schema. Under the CHS SCAMIN schema, navigational aids are exempt from SCAMIN and are thusly visible at

all times and all zoom factors. Canadian hydrographers also stressed that the CHS ENC portfolio is currently consistent in the application of SCAMIN in all Canadian waters.

Level of Effort

Canada's ENC portfolio currently consists of 500 ENCs, 25% of these are currently being produced in the HPD production environment. Current production goals aim to have the remaining ENCs migrated to the HPD environment within 2 years. IIC reports an average time of 16 hours per ENC. This does not include any necessary data clean-up. Using the IIC metrics as a baseline and assuming that the production goals are met, it would take CHS 4 years to completely re-scheme the Canadian ENC portfolio.

Mariner's Input Meeting 2008-05-26

CHS hydrographers recommended that the results of the pilot project be presented to a focus group consisting of mariners from various navigational environments. The focus group consisted of the following mariners:

- St. Lawrence Seaway Pilots
- Great Lakes Captain
- Canadian Coast Guard
- Sea-going Vessel Captain

The mariners interviewed overwhelmingly supported the CHS implementation of SCAMIN over the IHO recommendations. The major concern was the increase in the screen clutter at small scales. Mariners felt that the increase screen clutter, especially an over abundance of redundant soundings at small scales, made for a confusing picture and was deemed unnecessary at those scales. At these small scales, mariners felt that for route planning purposes the use of colour to represent depths was more than sufficient.

Once ENCs approach larger scales, the mariners saw little to no difference in the application of SCAMIN on either product.

Conclusion

The Canadian Hydrographic Service (CHS), in consultation with mariners and Canadian regional experts, believes that the IHO/IC-ENC recommendations for the application of SCAMIN on ENCs does not improve Canadian ENCs, and may adversely affect the usability of CHS products. Therefore, CHS will not implement the IC-ENC recommendations.

Canada agrees that ENCs should strive to be consistent across portfolios and international boundaries, and Canada views the IC-ENC recommendations as a valuable first step in achieving such consistency, especially for HOs that have yet to implement a SCAMIN solution. However, the Canadian ENC portfolio is consistent in SCAMIN implementation and the CHS use of SCAMIN **goes beyond the minimum recommended** values as set in CHRIS19-06.1C and IC-ENC. Canada believes its current (and long serving) coding practices are in line with the spirit of the IC-ENC recommendations.

Appendix A

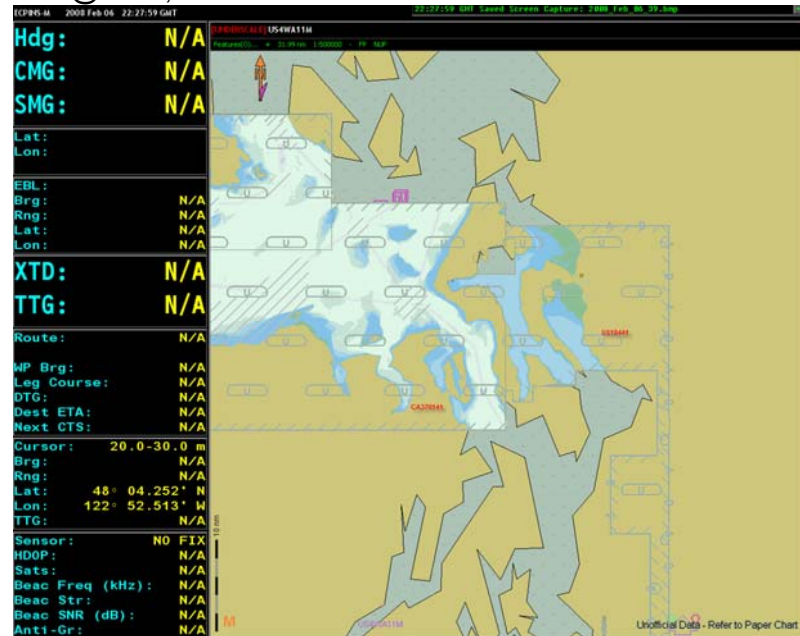
Side by side screenshots comparison between CHS-SCAMIN and IC-ENC New SCAMIN along with current US trans-boundary ENC's at various scales. Please note that no modifications have been made to US ENC's. The US have not formally adopted or implemented the IC-ENC recommendations.

DFO-CHS Harmonized SCAMIN with US Chart Comparison

CHS SCAMIN

CA370141 with US18441 (US4WA11M)

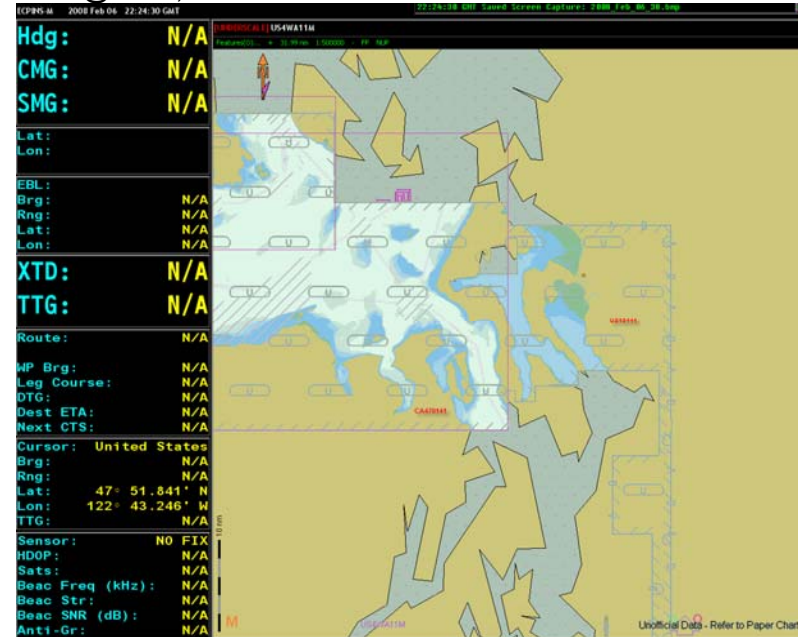
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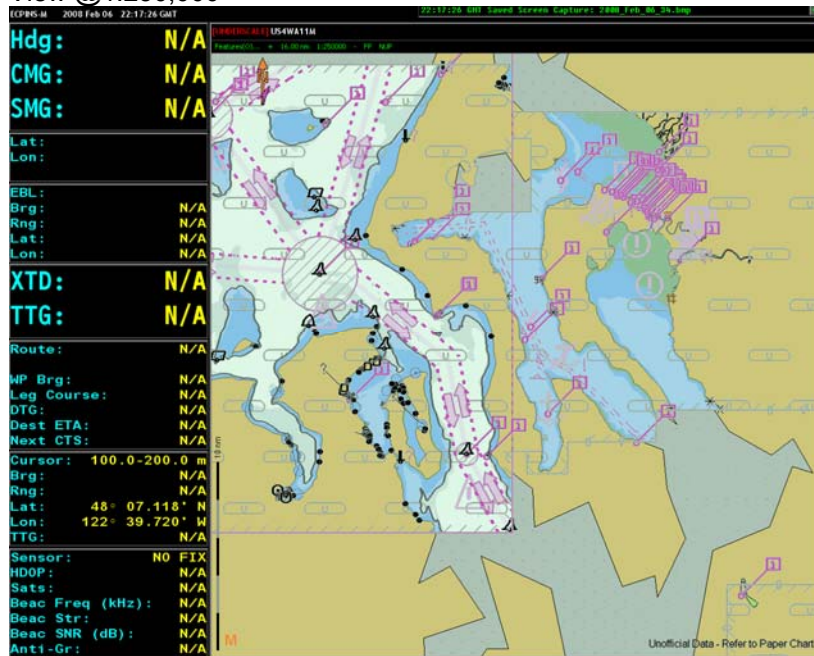
IC-ENC SCAMIN

CA470141 (original 370141) with US18441 (US4WA11M)

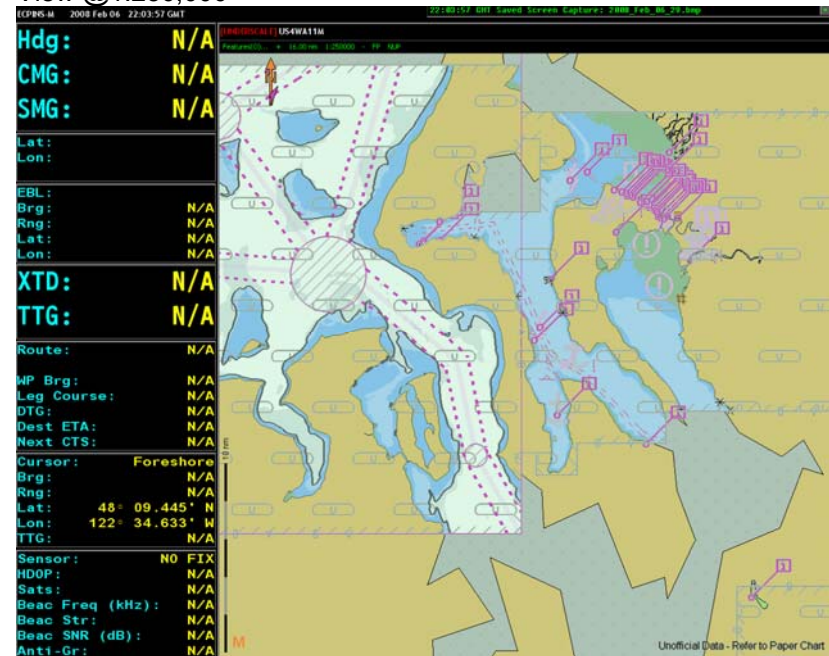
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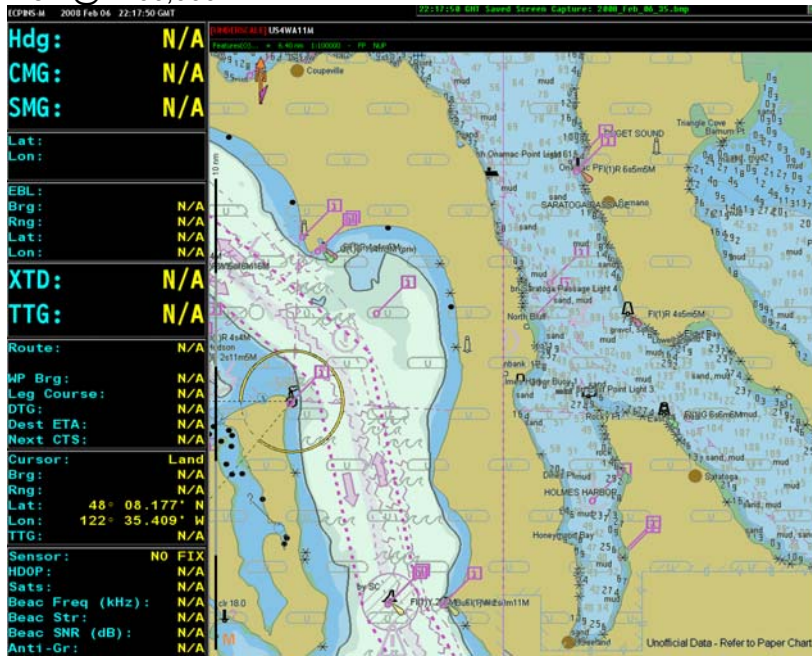
CHS SCAMIN
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 View @1:250,000



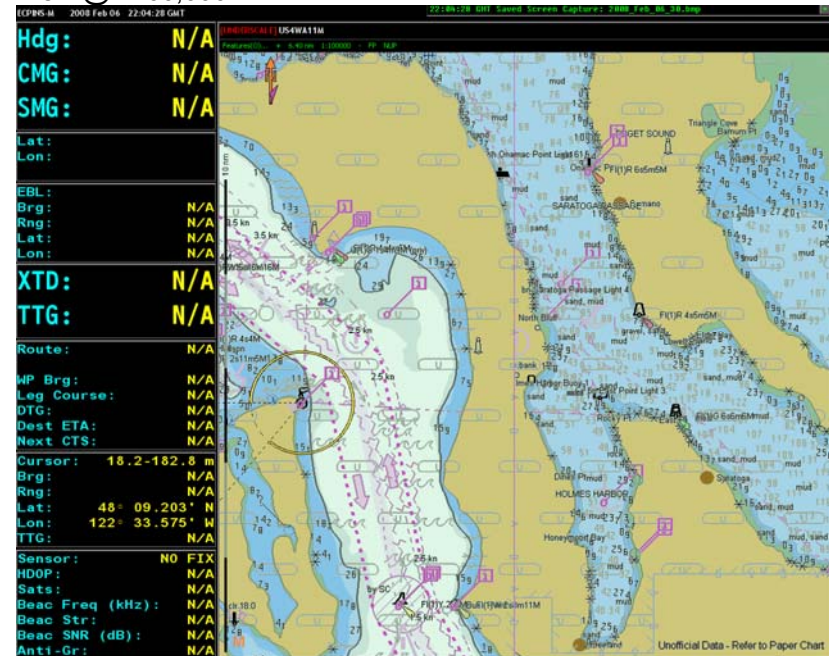
IC-ENC SCAMIN
 CA470141 (original CA370141) with US18441 (US4WA11M)
 View @1:250,000



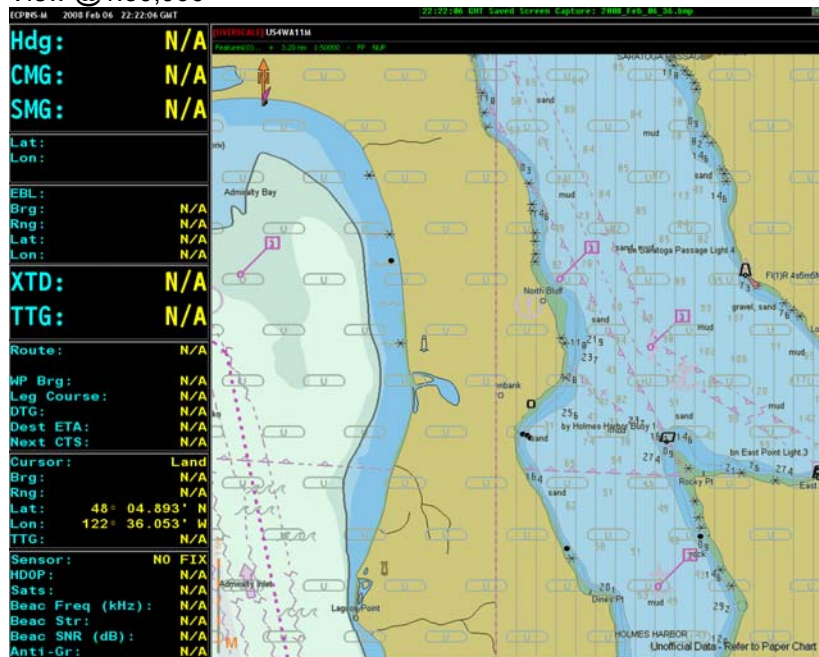
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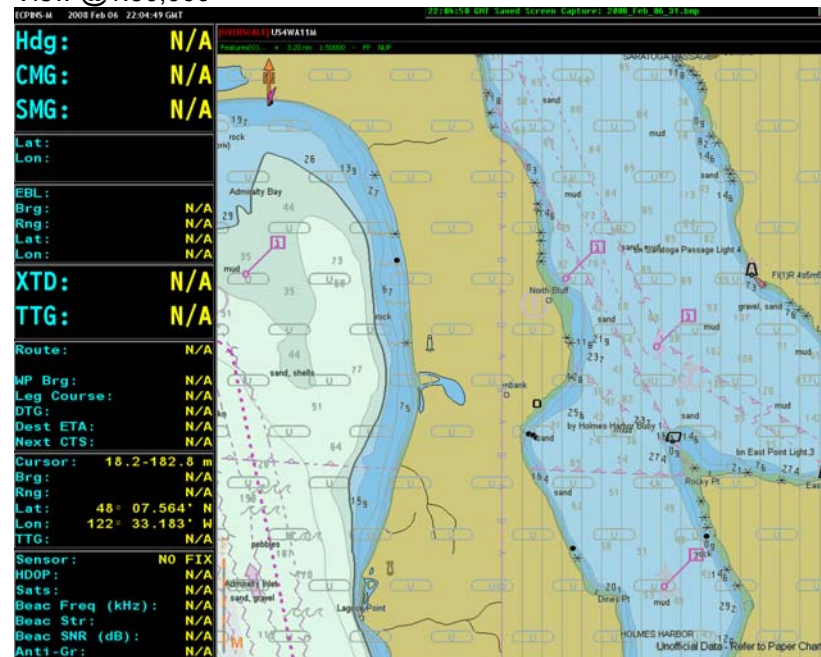
IC-ENC SCAMIN
 CA470141 (original CA370141) with US18441 (US4WA11M)
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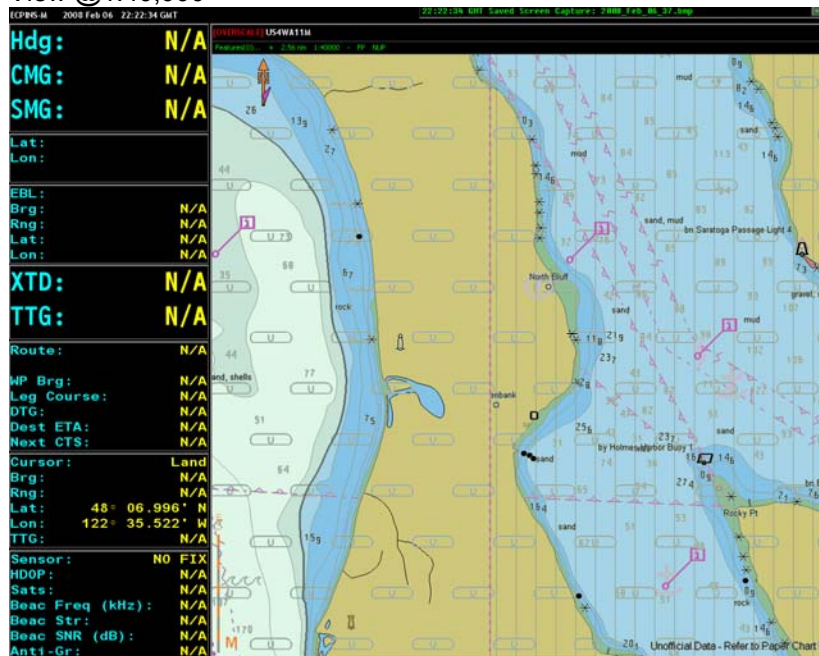
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 CA370141 with US18441 (US4WA11M)
 View @1:50,000



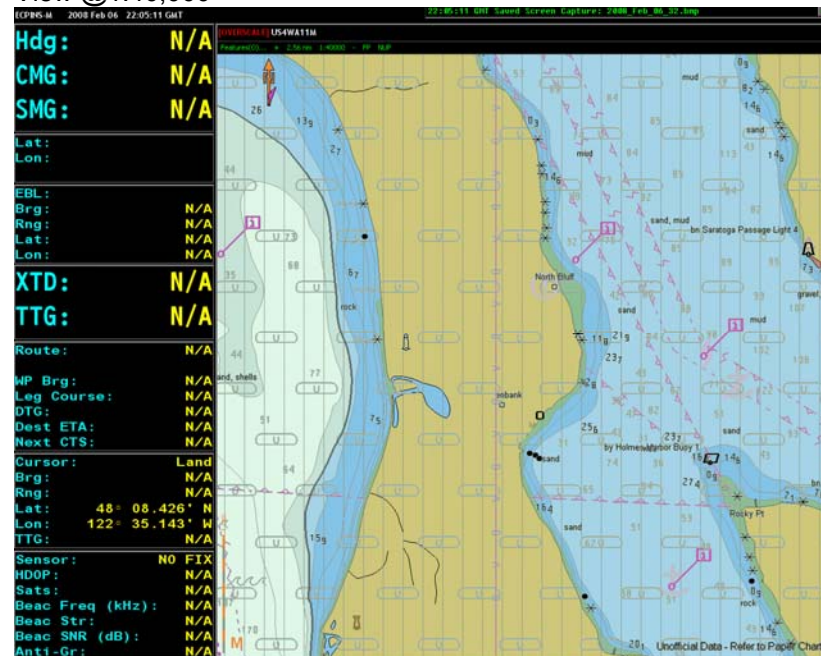
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 CA470141 (original CA370141) with US18441 (US4WA11M)
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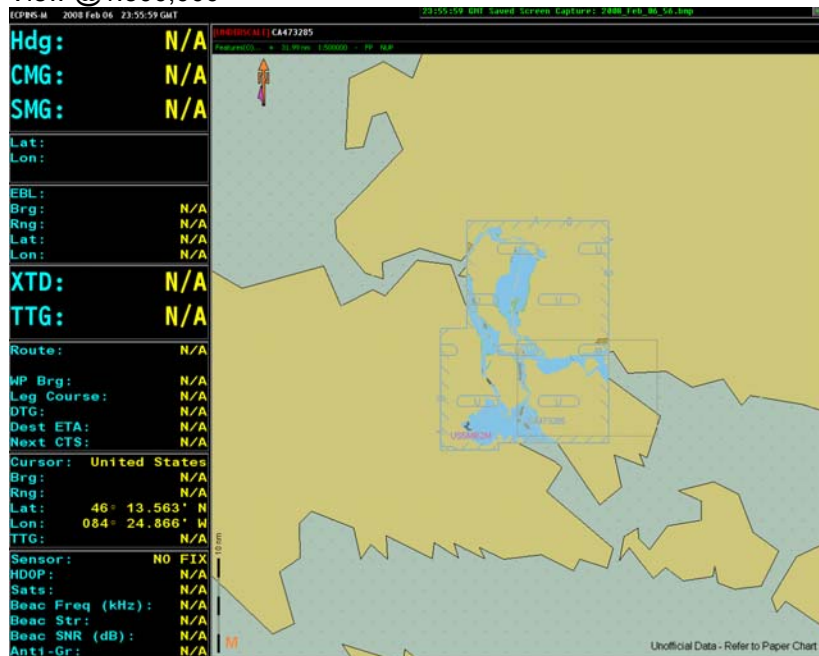
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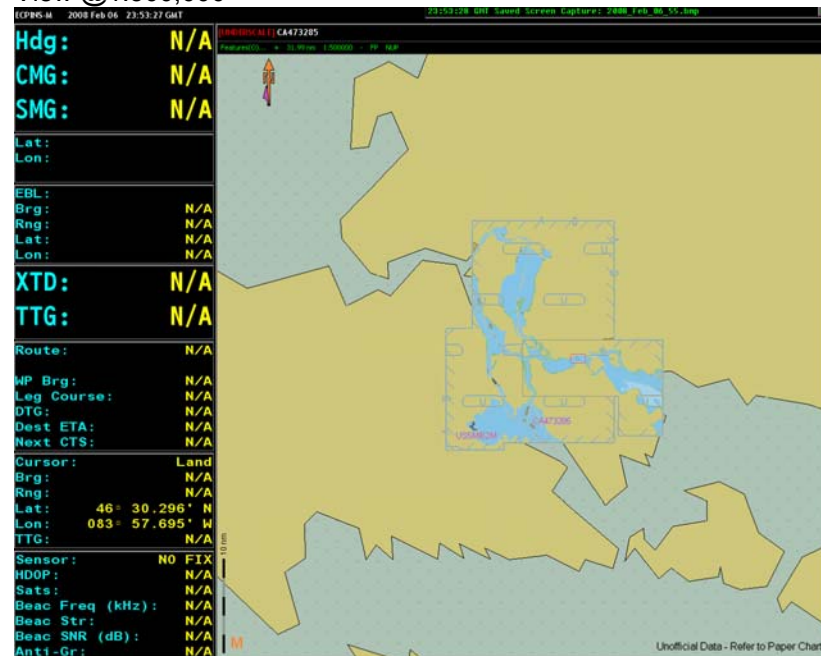
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 View @1:40,000



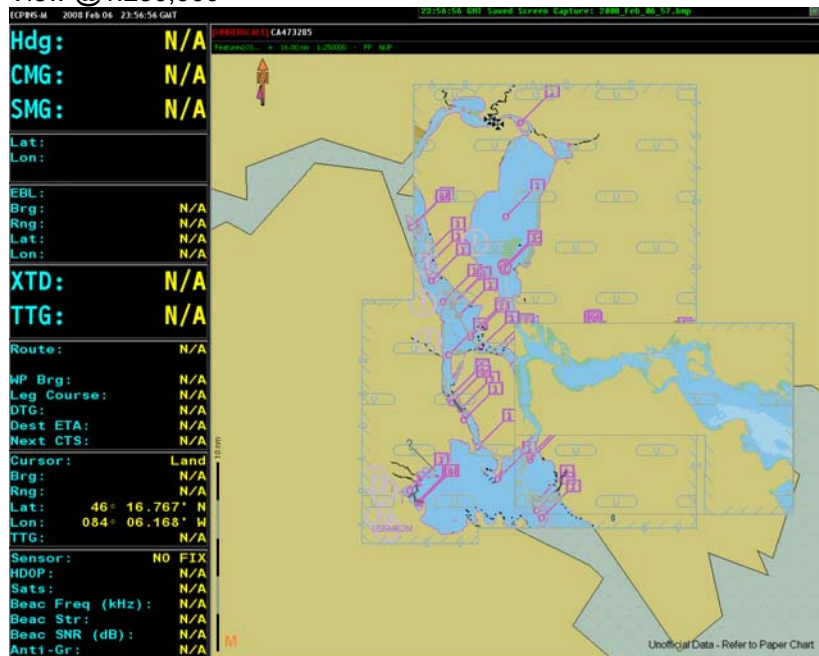
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 CA473285 with US14883 (US5MI62M)
 View @1:500,000



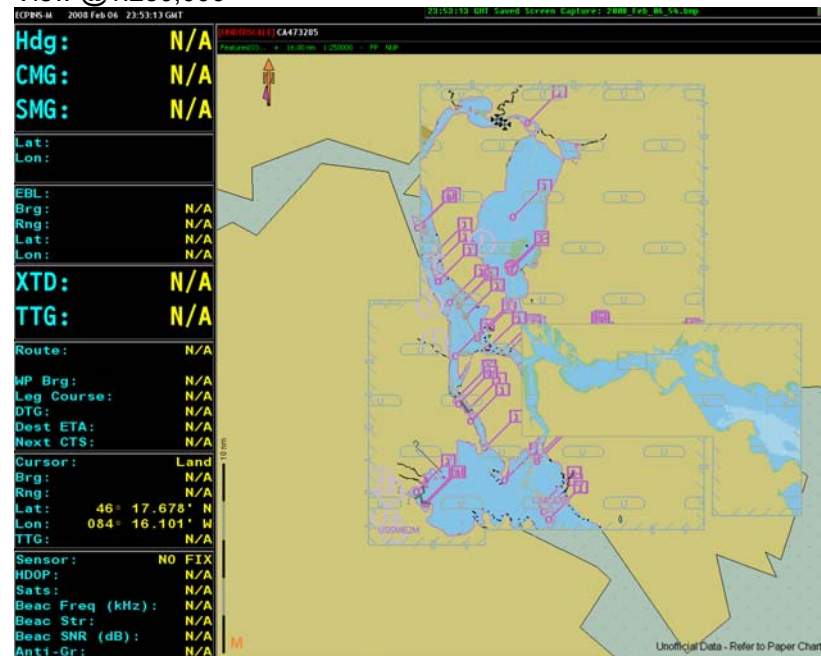
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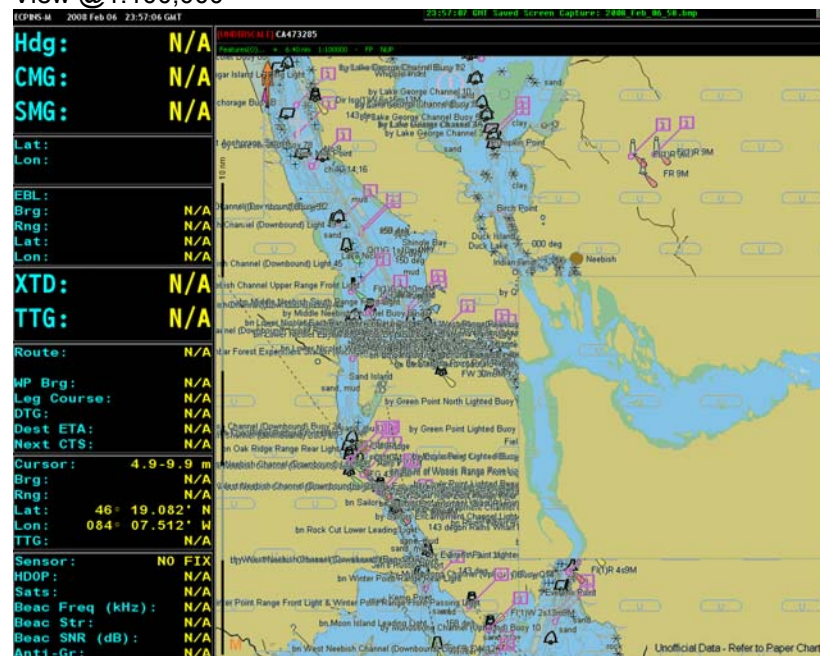
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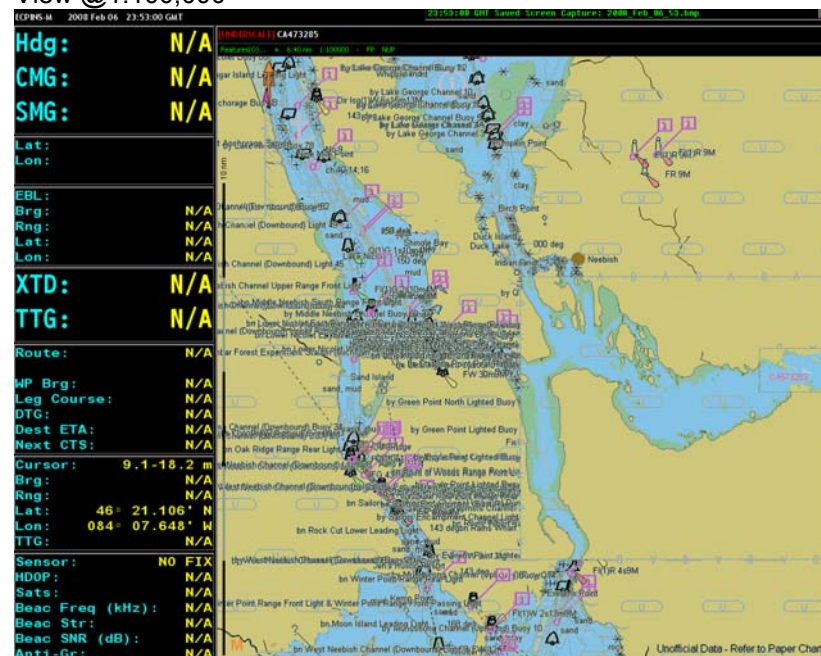
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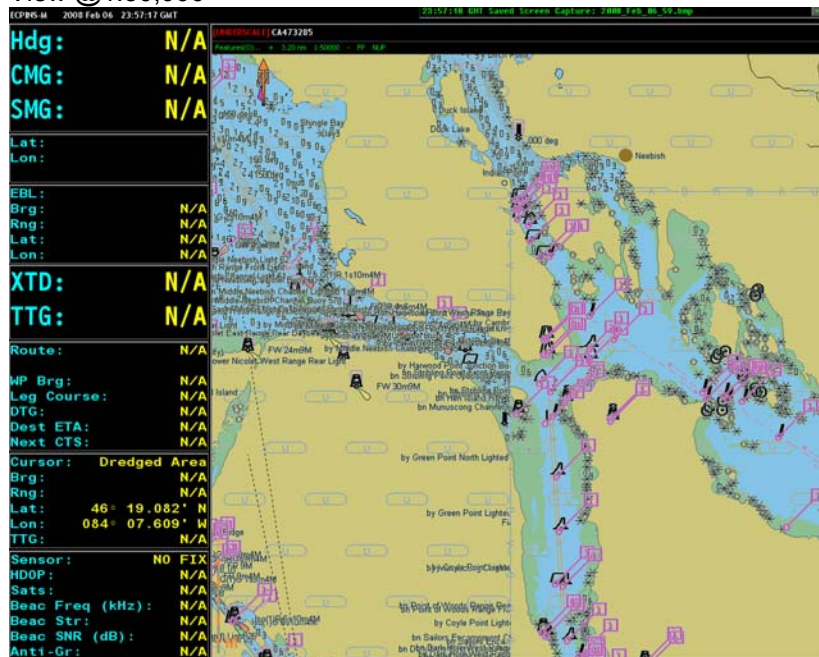
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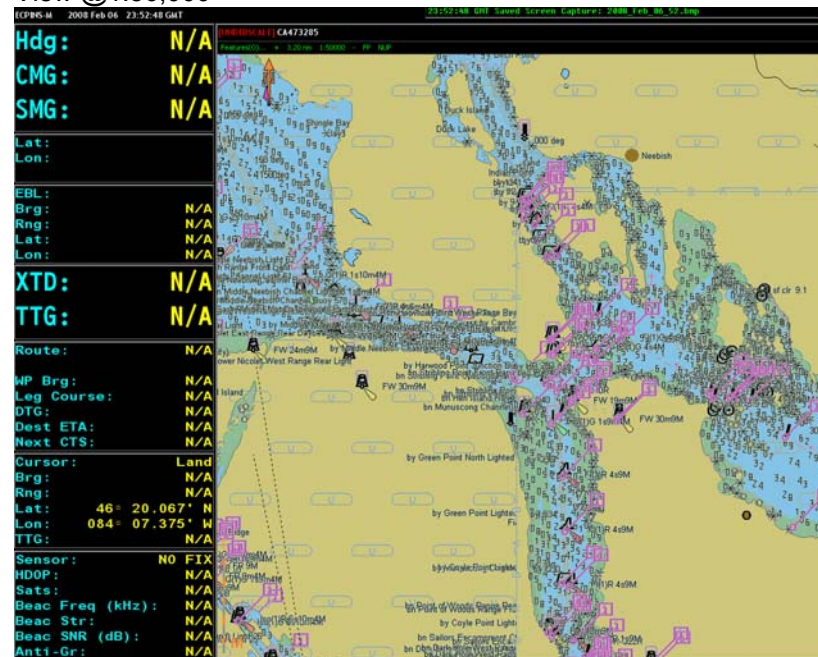
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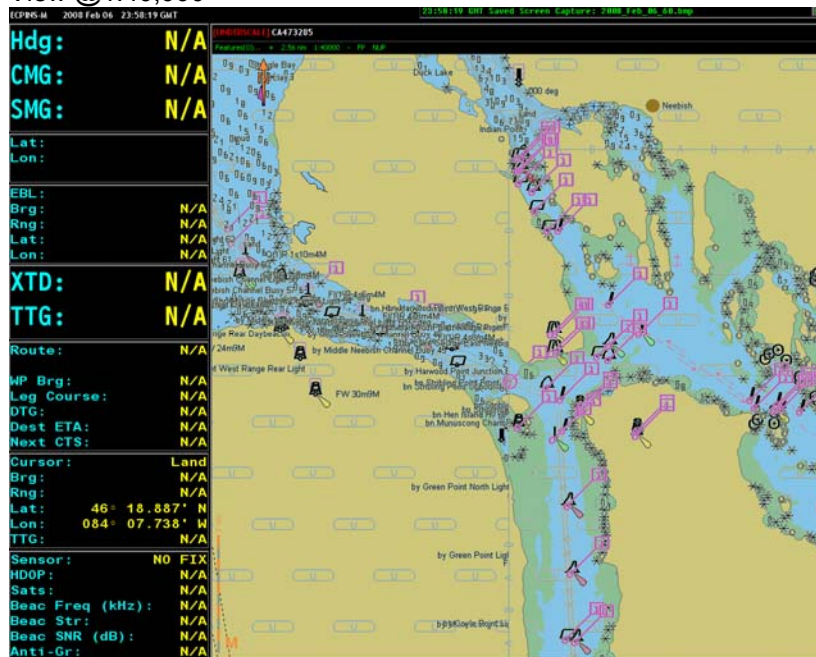
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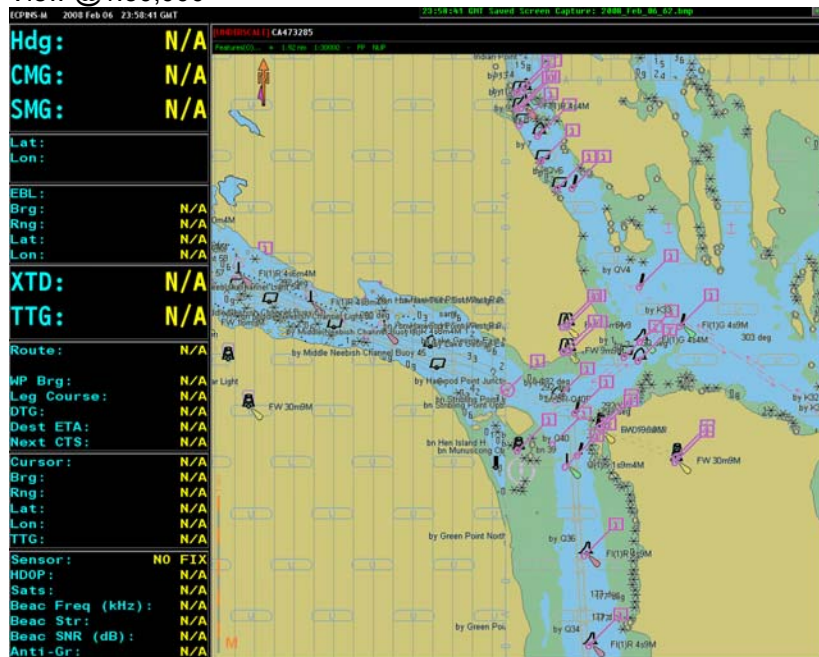
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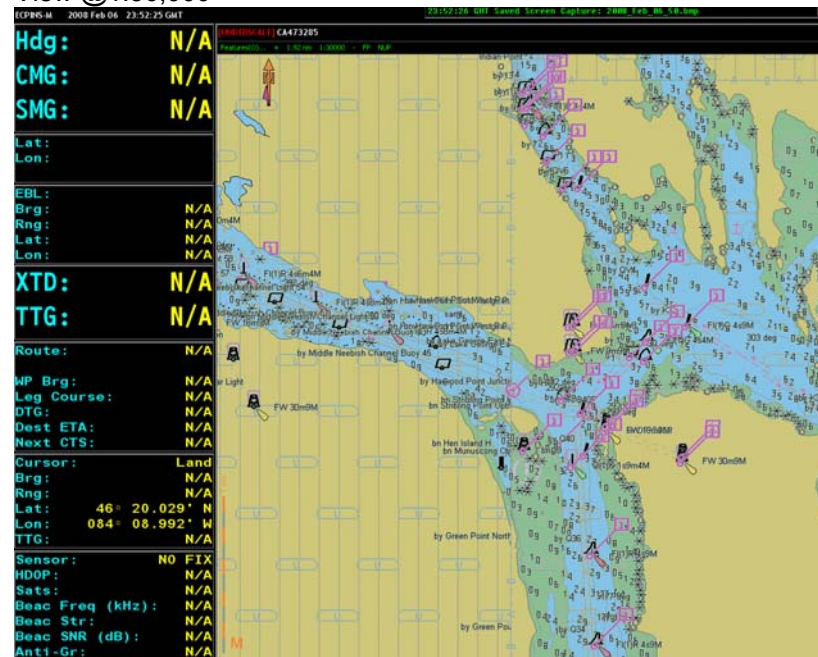
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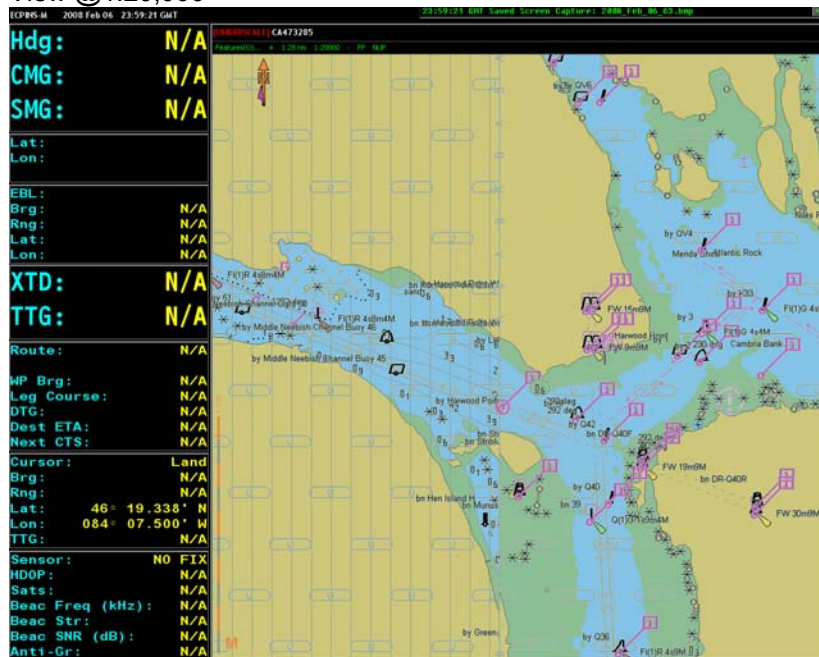
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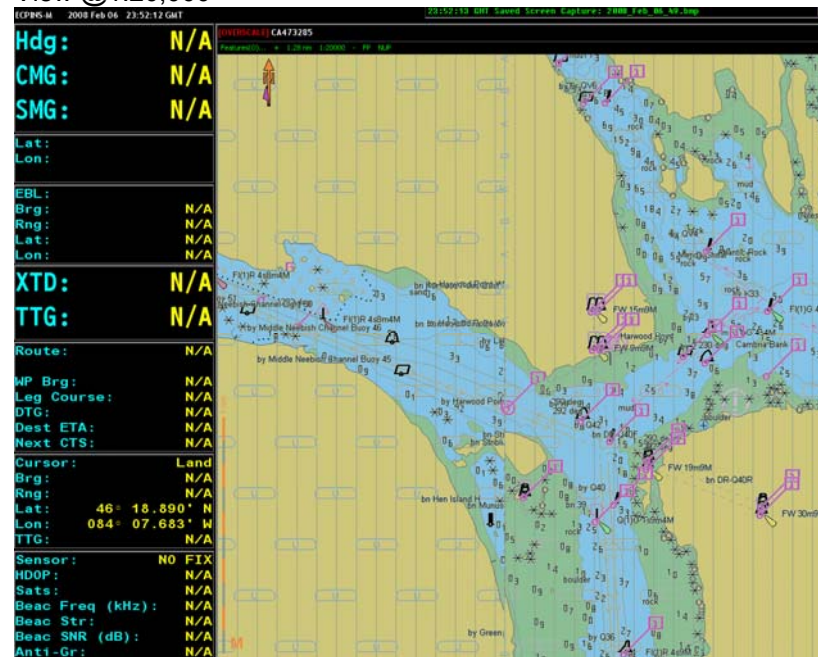
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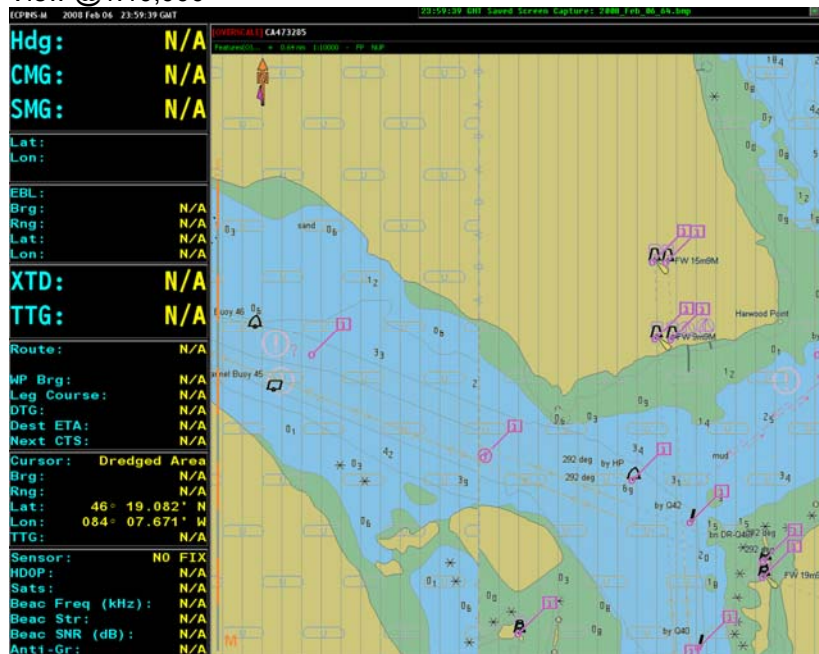
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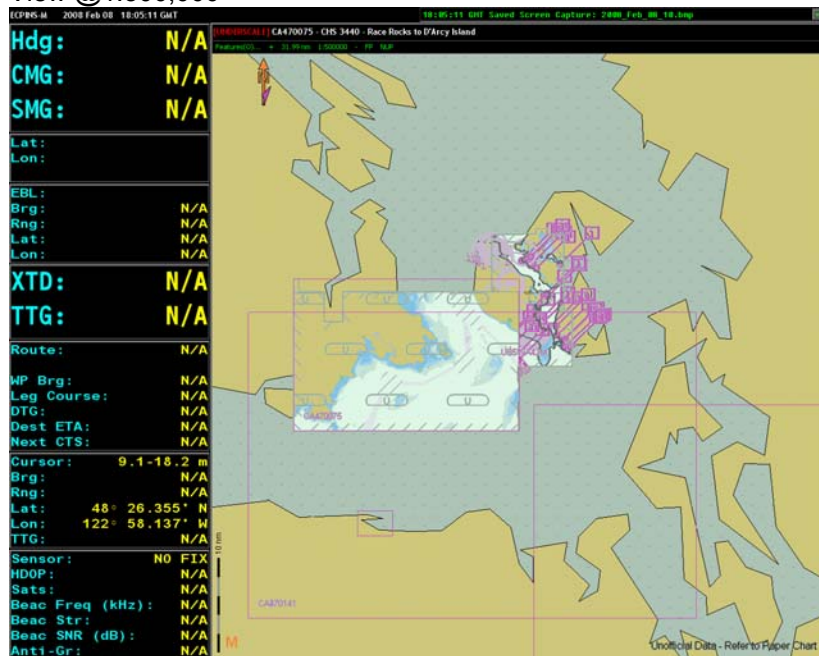
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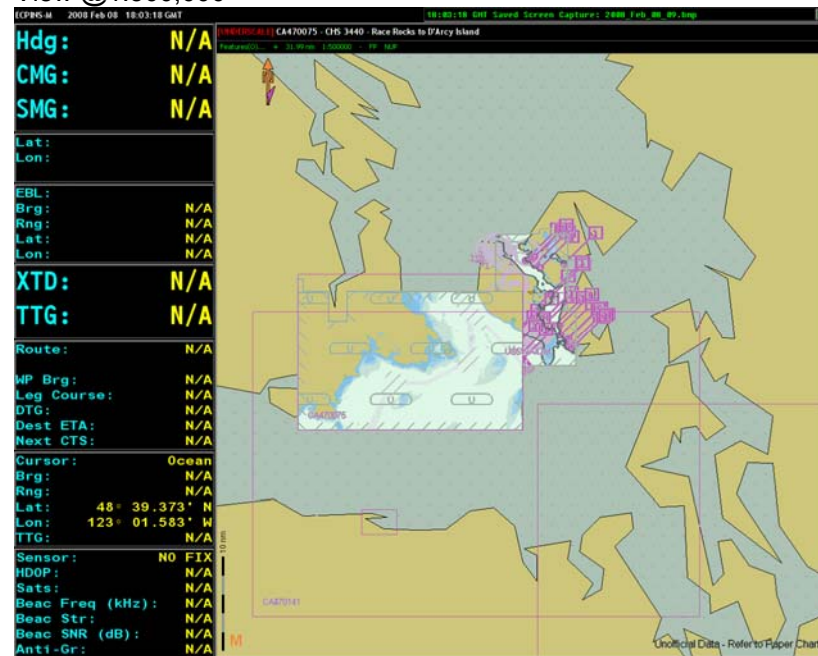
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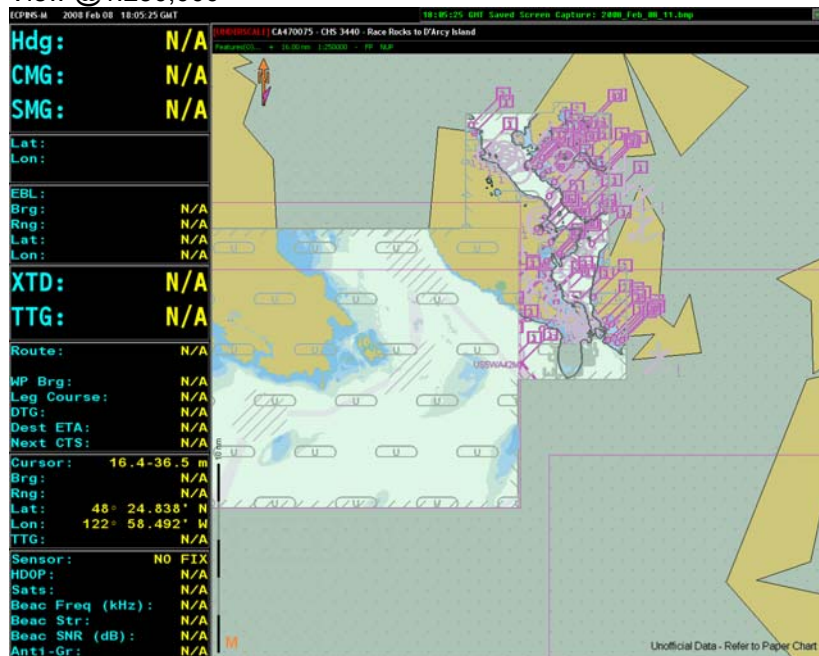
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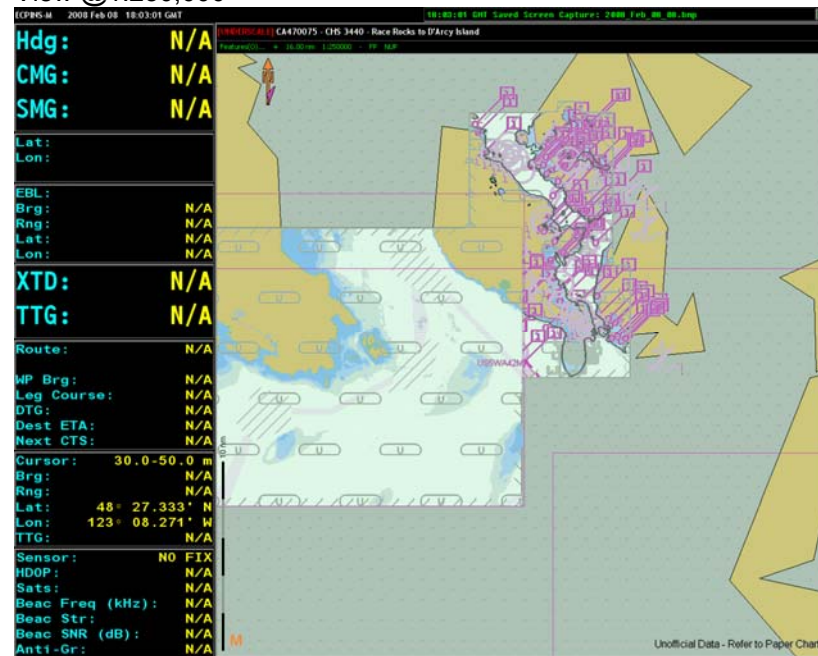
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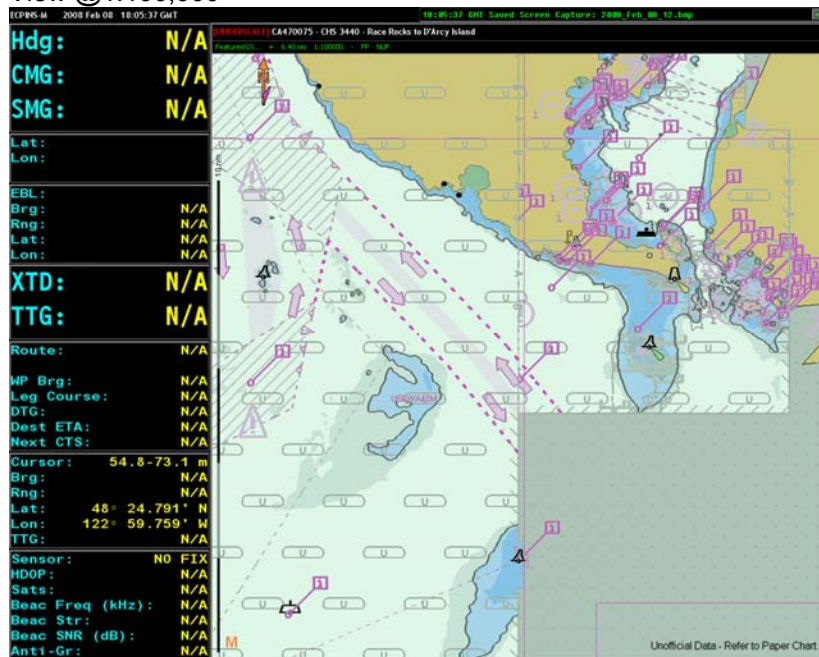
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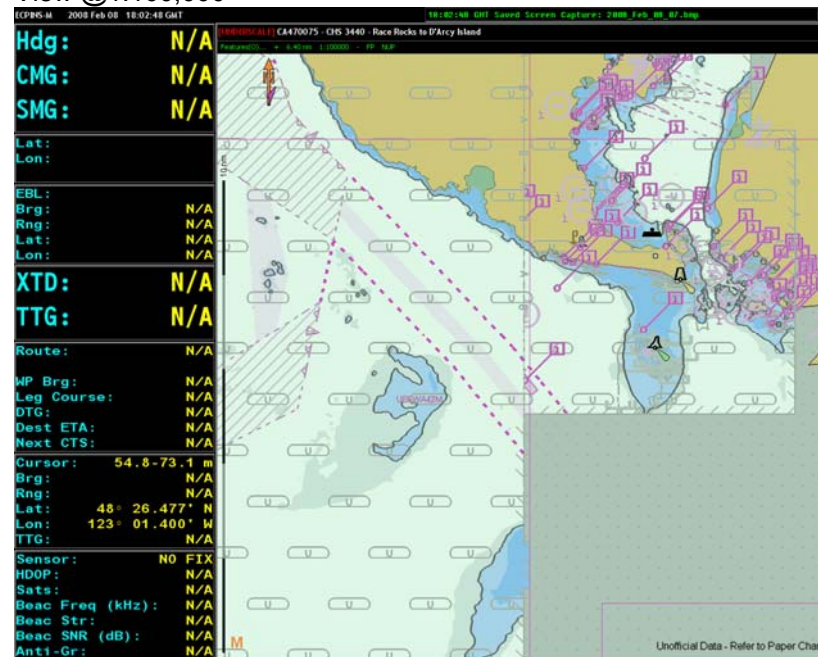
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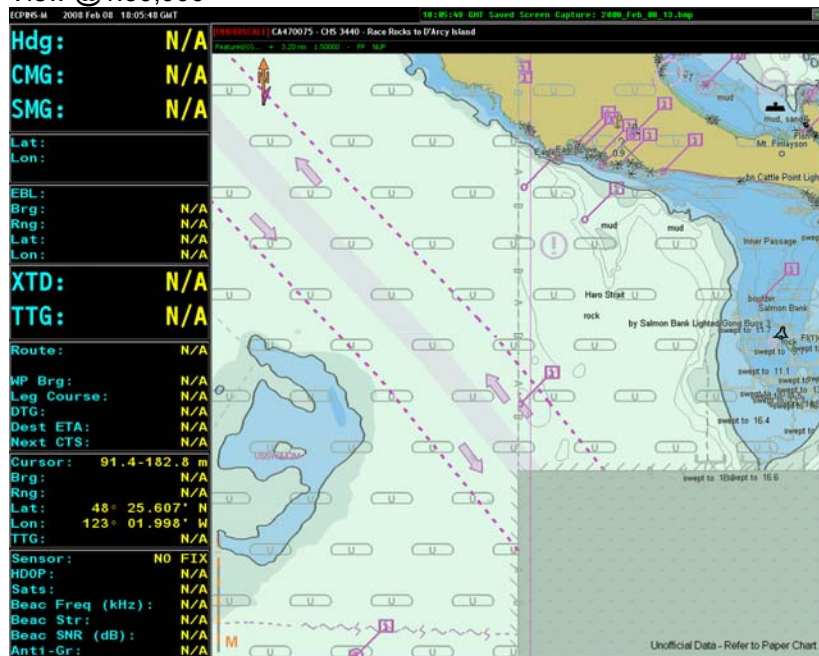
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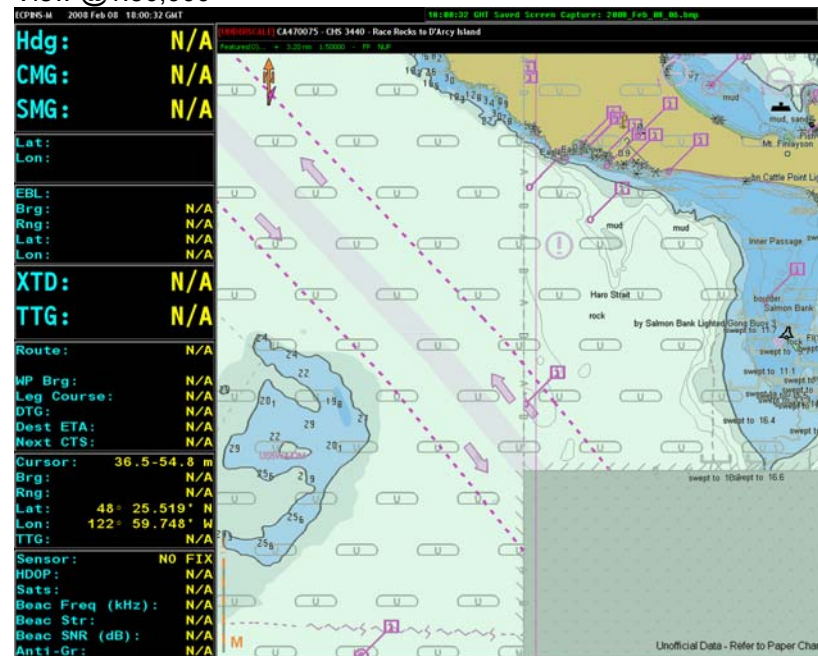
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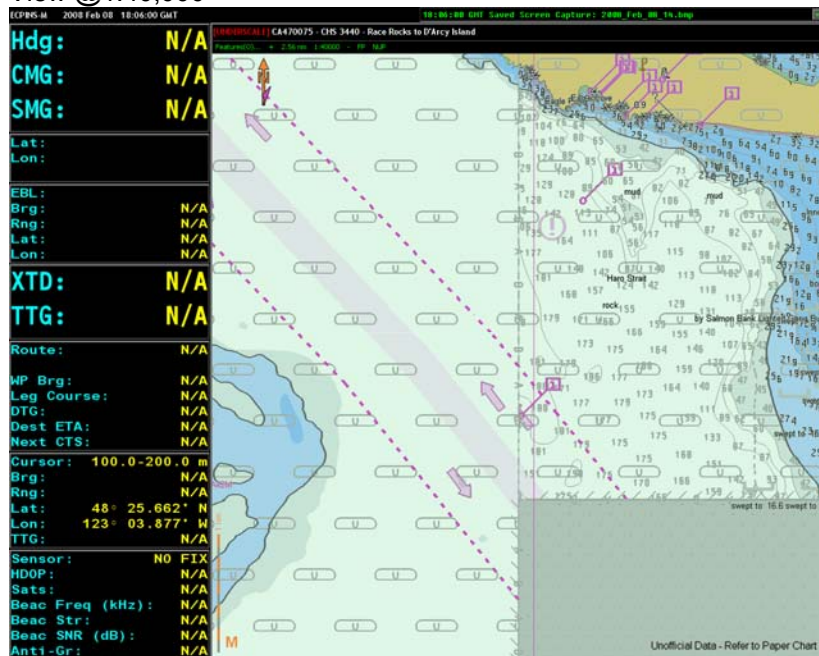
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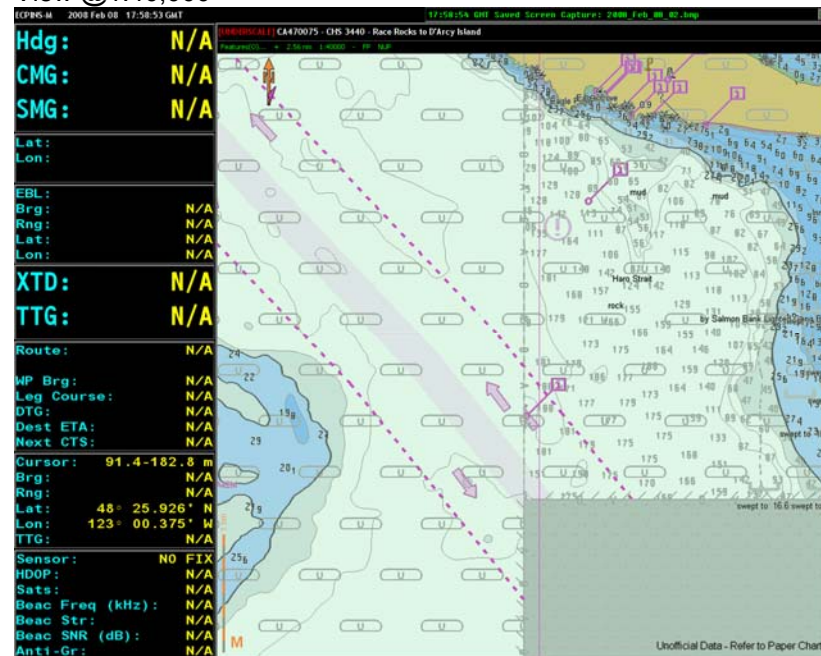
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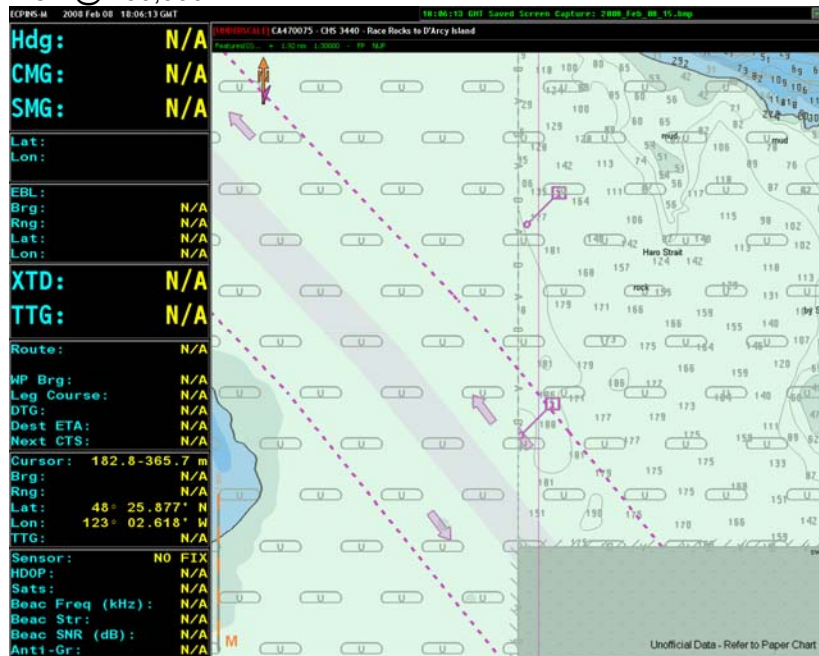
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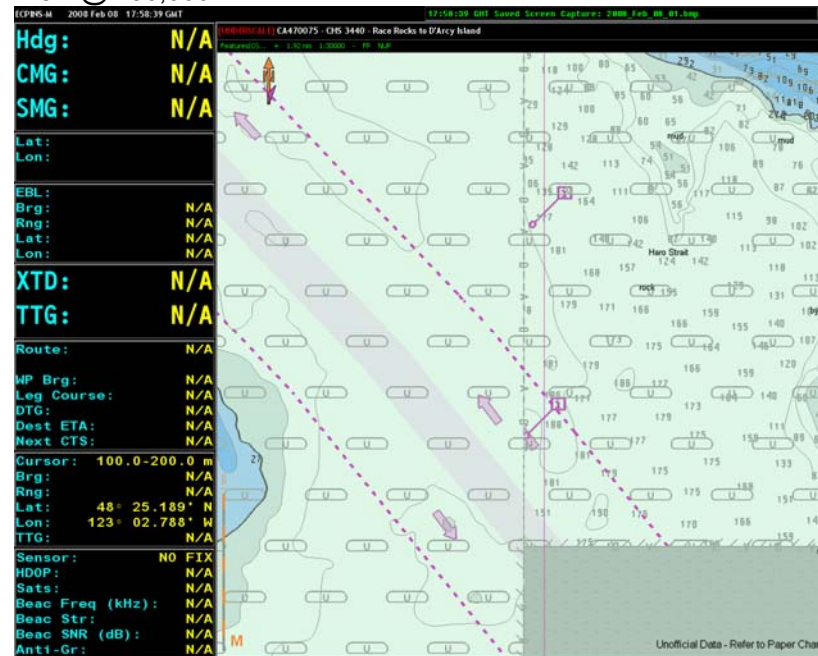
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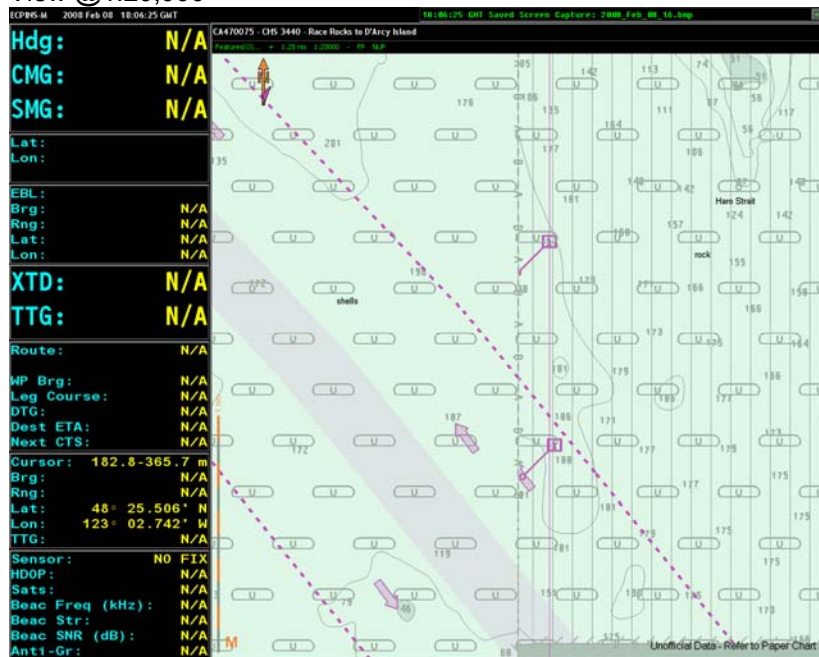
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