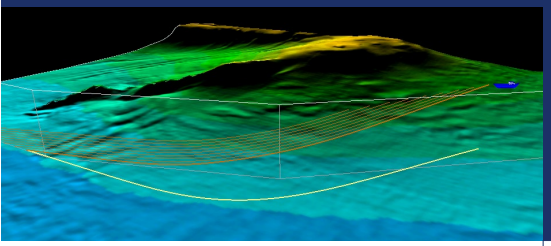
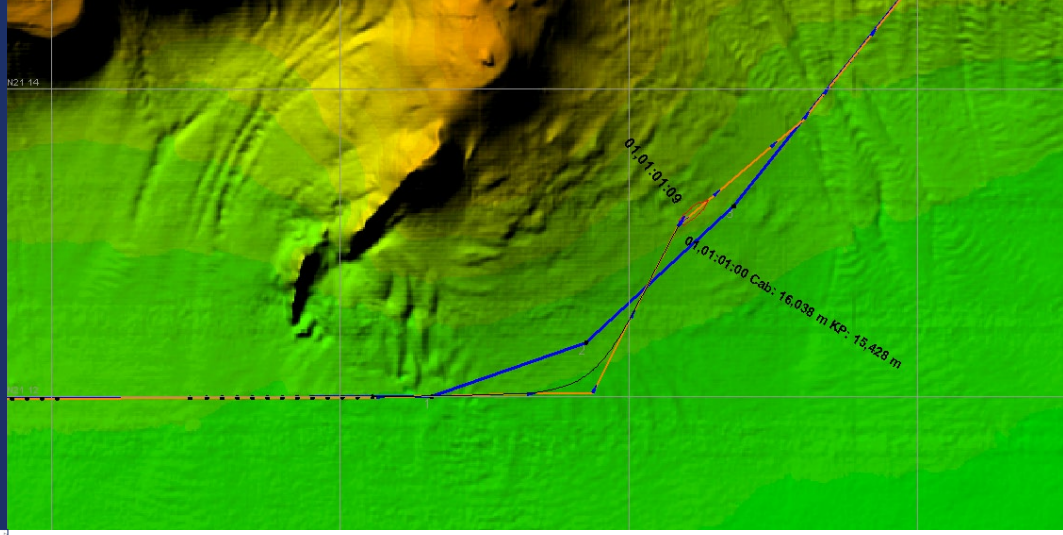
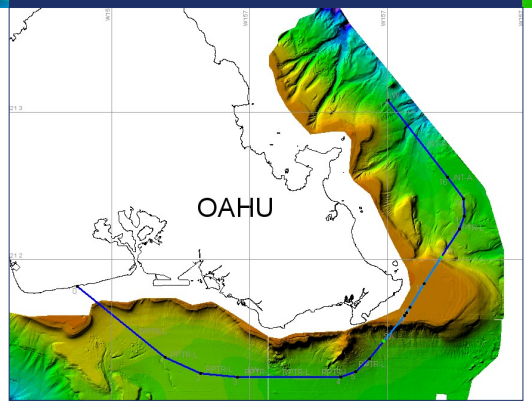
MakaiPlan Pro

Submarine Cable Planning and Simulation Software





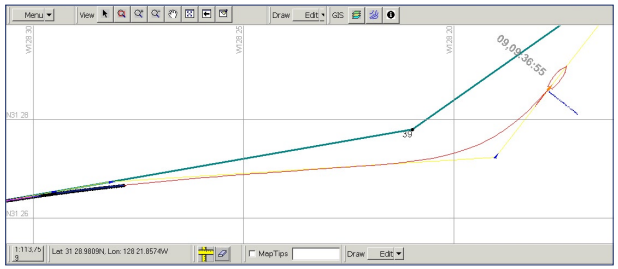


MakaiPlan Pro is an extension of the successful cable planning software, MakaiPlan. Besides performing the cable planning tasks associated with MakaiPlan, MakaiPlan Pro allows the user to perform powerful and precise 3D, dynamic simulations of a submarine cable installation. The operator can quickly simulate an entire cable lay in advance and in his office at 25 to 50 times faster than real-time; a complete lay can be completed in one day.

The simulation provided by MakaiPlan Pro gives a detailed understanding of cable behavior, can be used for training cable engineers, for pre-lay and post-lay analysis, and to create a detailed Ship Plan for installation. A detailed dynamic analysis and simulation is valuable to best understand and plan for dynamic cable situations such as starts and stops, repeater deployments and sharp altercourses.

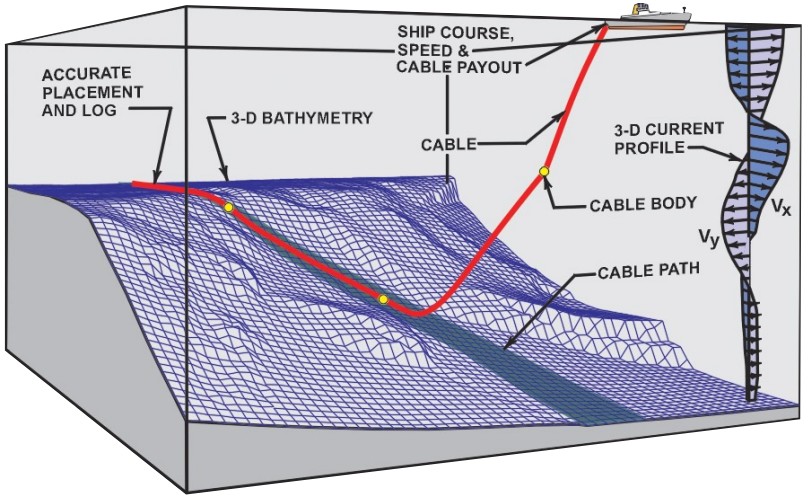
CABLE ROUTE PLANNING

MakaiPlan Pro is a PC windows-based program which works in a Geographic Information System (GIS) environment (using tools from GeoMedia by Intergraph) to allow you to precisely place your cable relative to shorelines, bathymetry, other cables, etc. MakaiPlan allows you to collaboratively design a cable path with cable designers, owners, surveyors, and installers all sharing the same project data. See Makai's brochure on MakaiPlan for details.



PRELIMINARY SHIP PLAN

MakaiPlan Pro can create a preliminary ship plan. This is the detailed set of ship and cable payout instructions for installing the cable along a given seafloor cable path. The Ship Plan is similar to a Route Position List (RPL) except that it is surface oriented. The preliminary Ship Plan is generated quickly and automatically based on simple steady-state approximations to the cable installation process–it provides a first-cut at a Ship Plan.



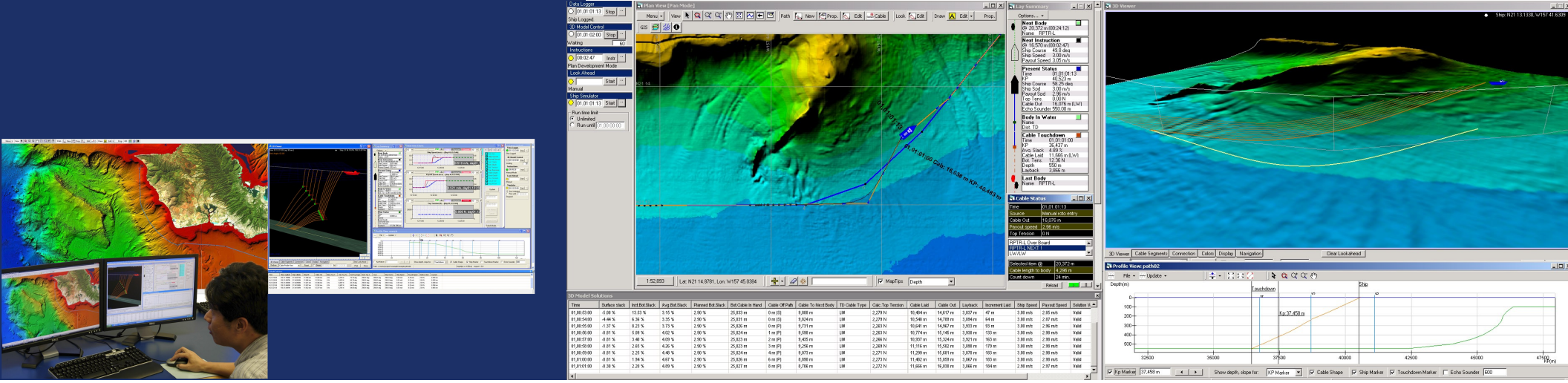
CABLE LAY SIMULATIONS

MakaiPlan Pro includes a state-of-the-art cable installation model that can quickly and accurately compute the cable shape and movement during a submarine cable lay. *MakaiPlan Pro*'s cable model computes the complex, three-dimensional, dynamic shape of the cable between the ship and the touchdown under nearly any sequence of ship movements, cable payout and cable types and bodies.

Makai's model has been rigorously tested and calibrated at-sea. As a result, the cable touchdown conditions–location, slack, tension and even bottom dragging–are confidently computed. With *MakaiPlan Pro* you can simulate the installation of an entire cable lay in order to compute the actual cable touchdown conditions for a given ship plan.

CABLE LAY FEASIBILITY

With *MakaiPlan Pro* you can determine whether a cable installation is feasible, given certain RPL requirements, ship limitations, and environmental conditions. You can make all your mistakes in advance on the simulator when they can be easily corrected and before they become costly at-sea disasters.



CABLE ENGINEER TRAINING

MakaiPlan Pro is similar in operation to Makai-Lay – Makai's at-sea cable monitoring, logging, navigating and controlling software. Operators can run entire cable installations prior to going to sea and become familiar with both the software concepts and the details of a particular cable lay.

FINALIZING A DETAILED SHIP PLAN

With *MakaiPlan Pro*, the cable installation can be simulated in detail and refinements can be made to the preliminary Ship Plan. With a dynamic 3D simulation of the lay, you look at the entire installation, minute-by-minute, and compute seafloor slack, tension, and location along all or portions of the route.

The analysis can be accomplished at 25 to 50 times faster than real time (1 to 2 days processing). Every repeater touchdown, every altercourse, every splice, every slowdown and every stop can be graphically reviewed and adjustments made to the preliminary plan to compensate for these unsteady events.

POST INSTALLATION ANALYSIS

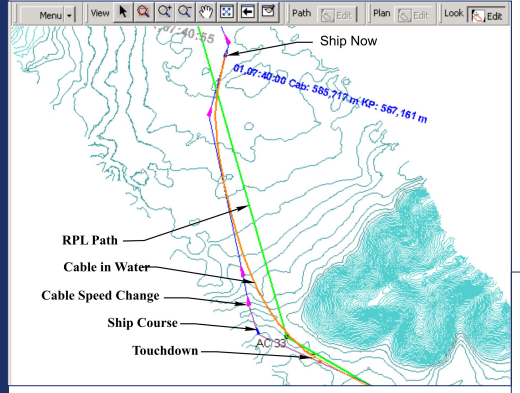
MakaiPlan Pro can be used to simulate in detail a cable installation after the installation is complete. As-laid cable paths can be refined and potential seabed problems can be identified.

3D VISUALIZATION

Using the Makai Digital Terrain Modeling (DTM) software, MakaiPlanPro allows you to accurately process and visualize large amounts of point data collected along an entire surveyed area in order to identify any potential hazards for plowing or surface lay operations (see MakaiDTM brochure for details).

During a simulation, *MakaiPlan Pro* allows you to fully visualize the installation process in 3D, including the seabed surface, not just the planned cable route.

MakaiPlan Pro 3.2 *Upgrade*



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1. New Makai DTM module (add-on) includes an easy-to-use wizard transforming your raw survey point data into grid data and georeferenced color shaded relief maps.

2. Simulation speed increased 4x.

3. Improved simulation data storage: size of data files reduced buy a factor of four.

4. Easily incorporate ocean currents in your simulations: create and use simple or more realistic currents that change with time and depth.

5. Serial ports no longer required to run simulations.

6. 3D finite element cable model improved and optimized for specific applications such as seismic, flexible pipes, and deployment of scientific and defense arrays. Over 100 cable bodies and joints can now be modeled simultaneously in the water column.

7. Capability to model installations using top tension measurements and peel-off tension modes instead of cable length (roto measurements).

8. Post processing capabilities: load navigation and cable engine data collected at-sea with third party software and fully model installation in the office to generate true, as-laid RPL.

9. Tools to estimate surface slack can be used during transients (speed changes and cable transitions) going over irregular bottom to achieve a desired seabed slack.

10. Fast dynamic tools to compute optimum payout rates during any situation including transients and emergency situations.

11. Backup, restore and merge data from different simulations.

12. Enhanced 3D viewer with multiple new options and displays.

13. Includes all new features from MakaiPlan 3.2.

14. Your competition has it, shouldn't you?

Each upgrade includes a one-year maintenance contract. For more information and pricing, contact Makai Ocean Engineering.