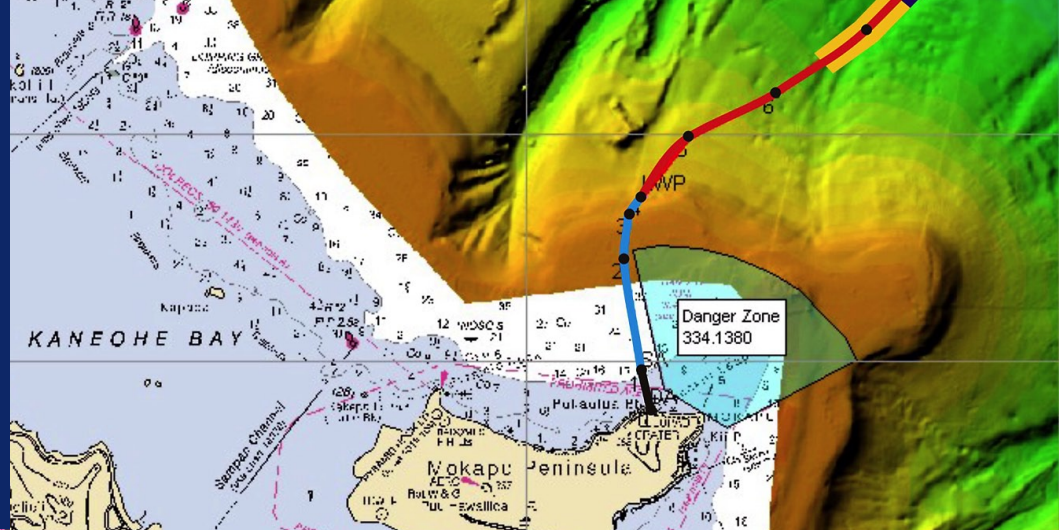
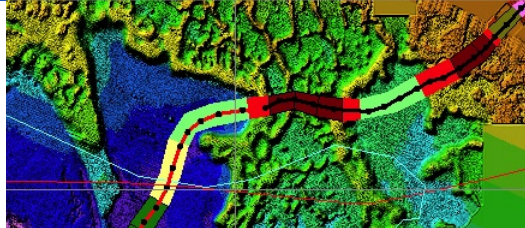
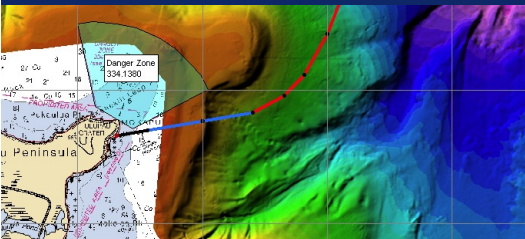


# MakaiPlan

Submarine Cable Planning Software



**MakaiPlan** is a software product which can be used to create submarine cable routes, define cables and in-line bodies, edit routes, define and adjust slack, instantly create an RPL and SLD, estimate costs and plan the installation of a submarine cable along the route. MakaiPlan allows multiple planners and designers to interactively work on cable installations with easy access to and exchange of project data. MakaiPlan works on your PC in Windows. If you know how to use other Windows programs and are familiar with cable planning, you already know 90% of what is needed to plan a cable route with MakaiPlan.

MakaiPlan has been created by Makai Ocean Engineering, the company that introduced 3D dynamic submarine cable laying control to the industry and has developed the most complete and accurate programs available today for controlling and simulating submarine cable laying. MakaiPlan has become the standard software for submarine cable route planning with over 150 licenses sold.

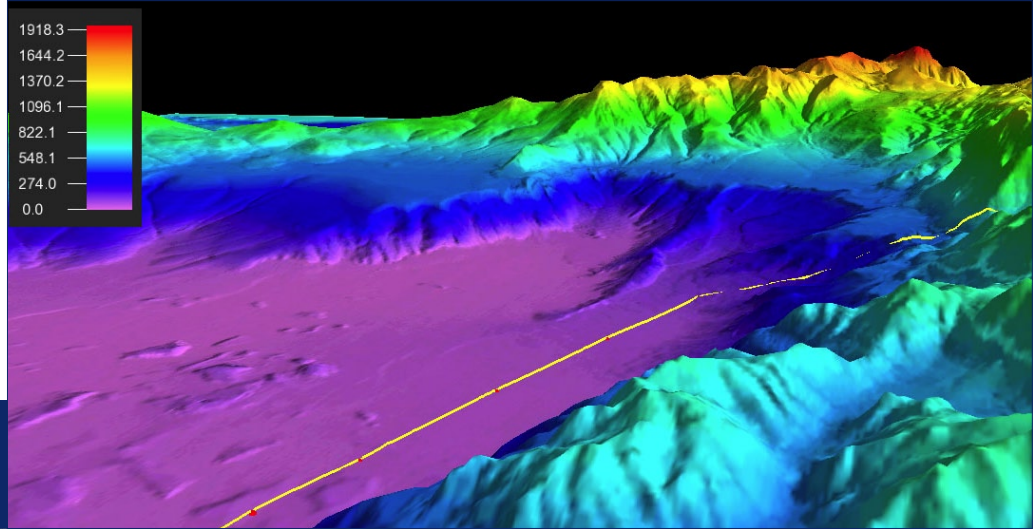
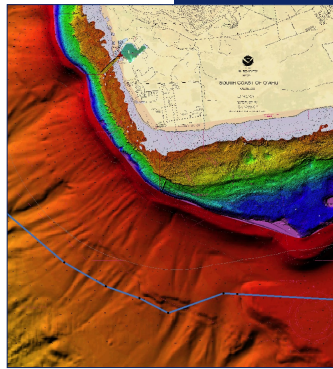
## THE POWER OF GIS

*MakaiPlan* works with a modern GIS (Geographic Information System) to provide access to databases for bathymetry, shorelines, soils, existing cables, survey data, navigational charts, and other geographically distributed data. *MakaiPlan* uses tools from GeoMedia© by Intergraph, has an open file structure, and can access a variety of standard GIS databases. *MakaiPlan* can also import and properly translate data from other GIS databases in a variety of formats, projections and datums.

## ROUTE DEFINITION

With *MakaiPlan*, you start with a map of the world. You define your region of operation and you import available information. *MakaiPlan* allows you to enter regional shoreline and bathymetric data (global bathymetric data and shorelines are included with *MakaiPlan*). You can create cable routes via point and drag, by entering precise coordinate points, by reading an existing RPL or by letting *MakaiPlan* automatically position a great circle route in a series of Rhumb lines. All computations and Kp route distances are accurately computed and displayed. The route can consist of any number of A/C points, as well as buried sections and special events. Slack is part of the route definition and both bottom and surface slack are shown.

R-03	60000	R-04	60000	R-05	19510	P.D. (SAL)	40490
170000	LW	230000	LW	290000	LW	309510	SAL



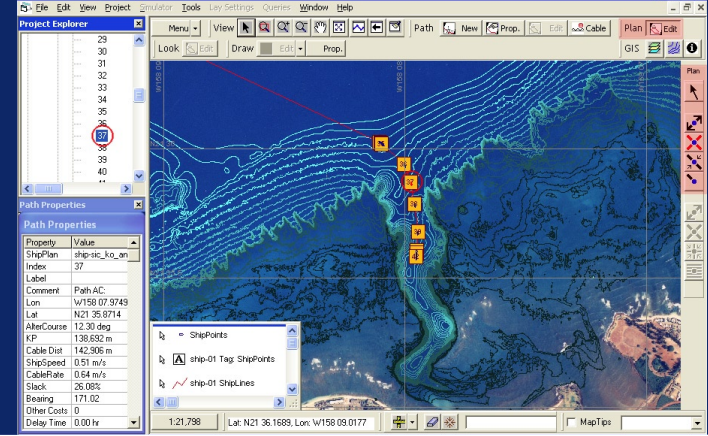
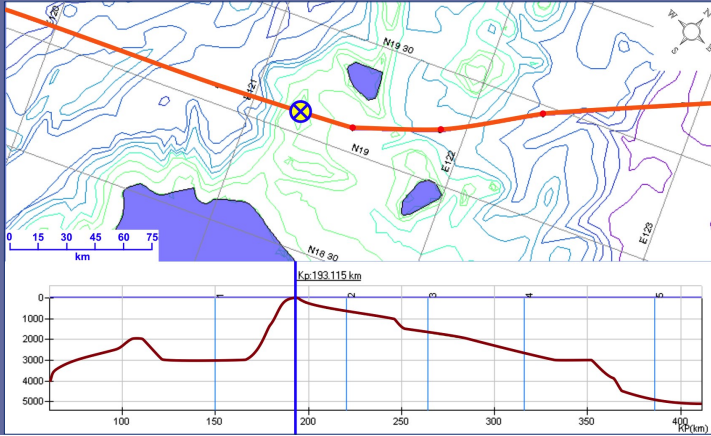
with *MakaiDTM* option

## DEFINE YOUR CABLE

The user can define the cable with cable types, transition points, and any user defined cable body. The cable types, repeaters, splices, and other cable bodies are precisely located along the route accounting for proper distribution of cable slack. Adjustments can be easily made to properly configure the cable. *MakaiPlan* works in two different modes. Flex mode (during initial route planning) allows you to alter the

cable length to achieve particular bottom slack conditions. Fixed mode (after cable is manufactured) allows you to fix the cable length so that any changes in the cable parameters will change the slack rather than the cable length.

*MakaiPlan* creates an SLD which can be displayed, printed or exported into other Windows programs.



## INSTANT PROFILES

*MakaiPlan* immediately computes the bottom profile along the selected route based on either contour or point data. Profiles are displayed and slopes are computed.

By zooming and panning along the route in both the plan and profile views, an optimal route can be easily found. Dual locators link the two views so that problems and solutions can be easily identified and quickly resolved.

## FAST AND ACCURATE RPL

You can instantly complete a detailed and accurate RPL which can be edited, exported, reversed or split into separate cable lays.

## INSTALLATION

Installation cost estimates can be compiled by *MakaiPlan* from input such as ship costs, laying speeds, special events, burial costs and cable costs.

Cable laying speeds can be defined and cable deployment angles are computed and displayed for comparison to the bottom slope.

Slack adjustments are easily made to the RPL to

account for the final as-loaded cable configuration. Varying ship speed, changing lay direction, and cutting the RPL into several lay segments are easily accomplished with *MakaiPlan*.

RPL Bottom				Options												
Index	Auto Label	Label	Latitude	Longitude	Bearing deg 1	Altitude deg	Distance (m) Segment	Slack % Total	Cable (m) Surface	Bottom	Segment	Total	Cable Type	Body Type	Depth m	Comment
242		SAL / LWP	N13 02 0900	W093 42 5940	266.602	-0.03	11.086	3.658.537	3.00	2.74	11.410	3.768.769	SAL		1.881	SAL / LWP
243		LWP / LW1	N13 01 8700	W093 45 5940	266.894	0.03	6.047	3.685.564	3.00	2.79	6.229	3.776.018	LWP		2.202	LWP / LW1
244		REP-368	N13 00 0470	W094 04 7440	266.825	-0.06	34.059	3.699.643	3.00	2.97	35.081	3.811.099	LW		REP-1 F: 2.980	
245		Columbus 0	N13 00 7020	W094 07 3640	266.770		4.745	3.704.388	3.00	2.99	4.887	3.815.986	LW		3.029	Columbus 0
246		Americas-2	N13 00 2670	W094 15 2130	266.745	-0.02	14.213	3.718.601	3.00	14.640	3.830.626	LW		3.175	Americas-2	
247		AC310	N13 00 0000	W094 20 0000	266.705		-16.37	3.727.271	3.00	8.929	3.838.955	LW		3.215		
248		REP-267	N12 54 9940	W094 33 1030	248.370	0.02	25.490	3.752.761	3.00	26.295	3.885.011	LW		3.266		
249		REP-267	N12 54 9039	W094 33 1034	248.345		1	3.752.762	2.99	1	3.885.011	LW		REP-1	3.266	
249		REP-366	N12 44 2738	W095 00 3990	248.345	-0.21	53.117	3.805.879	2.99	54.711	3.920.522	LW		4.063		
249		REP-366	N12 44 2738	W095 00 3994	248.132		1	3.805.880	2.99	1	3.920.523	LW		REP-1	4.063	
250		N12 40 3295	W095 10 3999	248.132			19.520	3.825.400	2.99	20.105	3.940.628	LW		4.677		
251		N12 38 5050	W095 15 0269	248.131		0.24	9.031	3.834.431	2.99	9.363	3.949.591	LW		4.779		

## EDITING

The real power of *MakaiPlan* is the ease of editing the cable and route information as conditions change throughout the planning and installation process. Editing a route is easily performed by point and drag or precise reentry of data.

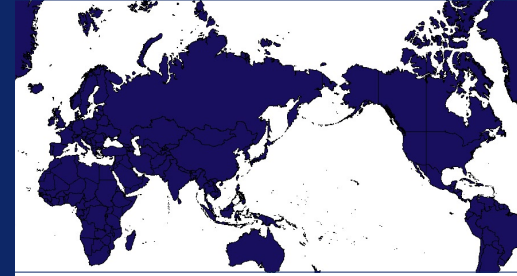
As additional information is added to the GIS database (final bathymetric survey, as-loaded cable, cable lay direction or speed), the route and cable can

be quickly and accurately edited to accommodate the needed changes. As a result, the plan is interactively created and modified based on the latest available information.

## 3D BATHYMETRY

Using the new Makai Digital Terrain Modeling (DTM) software, *MakaiPlan* 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. The new module allows you to load, process and edit the survey point (x,y,z) data, create grid files using a variety of methods, create user definable contour colored and shaded relief maps, superimpose the RPL on any of the created maps and quickly generate accurate slope graphs along and across any desired route section. All the maps created can be automatically geo-referenced as Geotiffs and viewable as layers on the main *MakaiPlan* GIS window.

# MakaiPlan 3.2 Upgrade



**Makai Ocean Engineering**

makaiplan@makai.com

Phone 1 808.259.8871

Fax 1 808.259. 8238

- 1.** Windows XP and Geomedia 6.0 supported and full compatibility with earlier versions of *MakaiPlan*.
  - 2.** New Digital Terrain Modeling (DTM) add-on provides capabilities to import point bathymetry data, create grids and generate colored, georeferenced 3D shaded relief maps.
  - 3.** Conveniently underlay geotiff images for quick visual access to required information.
  - 4.** Export cable routes, bodies and labels to \*.DXF files on different layers.
  - 5.** Hotlinks allow you to add a file or web page to any GIS feature in the database to provide additional information about the feature.
  - 6.** A log of changes to the path can be created and updated for review, configuration management, and/or quality control.
  - 7.** Add on option to navigate and view your 3D terrain from many different perspectives.
  - 8.** Create archived revisions of the path with the click of a button.
  - 9.** New crossing utility can extract data from a cable-crossing (or other line segment) area and include that data in the resulting point label and comment.
  - 10.** New improved interface to load generic RPL. Bodies can be imported automatically as the RPL is loaded.
  - 11.** Thematic rendering of custom GIS data-range or unique value rendering. Easily differentiate among operator-defined geographical or geological boundaries by using different color and pattern schemes.
  - 12.** Slack values can be adjusted in the fixed cable mode.
  - 13.** Define your own preferences for rendering slack and bathymetry ranges.
  - 14.** Within the cable assembly line diagram, define custom symbols, symbols at reference points and add additional data such as water depth.
  - 15.** Selection of multiple features when adding or removing GIS database entries (including bathymetry data).
  - 16.** Added the ability to backup/restore while editing the path.
  - 17.** A new notes feature allows you to easily add reference data, such as points, lines, areas and text, in the GIS screen and database.
  - 18.** Add and define your own custom variables to the path database and cable assembly.
  - 19.** Plan View can be copied into a Metafile to be pasted into third party programs (e.g., Microsoft Word, Excel).
  - 20.** Latitude of true scale for scale bar and printing.
  - 21.** AutoSave project feature.
- Each upgrade includes a one-year maintenance contract. For more information and pricing, contact Makai Ocean Engineering.**