MAXSURF NEWS

Integrated Naval Architecture & Ship Construction Software

March 2001 Newsletter

Tips & Tricks

Comparing Designs

There are a number of techniques you can use to compare two designs. The most obvious is to simply use the open command to open one design on top of another. The new surface colouring options in Maxsurf v8.5 allow you to assign different colours to the surfaces in one design making it easier to tell which is which.

A technique for seeing how a design changes while you are modifying it, is to use the Calculate Offsets function and to turn on the option to create markers from offsets. This will give you a set of markers which you can compare with your actual surface sections in the Body Plan view. This is particularly useful when used in conjunction with the new Measure Surface Error command. This will display the greatest distance between your original offsets and the new surface model.

You can even use this technique with multiple sets of offsets by copying each markers table into a sheet in Excel and then pasting back each set as required. Note that you need to add or delete markers to have the appropriate number of rows in the table, before pasting in the new set.

Subscription

Maxsurf users are supplied with updates to programs free of charge for one year after the date of purchase. After this period our subscription program will keep you up to date with the latest software versions.

A single annual subscription fee ensures that you receive updates to all programs on CD as soon as each new version is released. It also entitles you to unlimited technical support via phone, fax or email. Subscription fees are approximately 10% of the current retail price of the software.

Release Notes

With each new release of our software, we issue a release note which describes the difference between that version and the preceding version. Its important to review this note before installing and using the new version to ensure that you are aware of any changes to operation of the program.

Current Software Versions

The following is a list of programs currently offered by Formation Design Systems. Please contact your local distributor for pricing information.

Maxsurf Pro	Windows 8.5	Macintosh 7.2
Maxsurf Plus	Windows 8.5	Macintosh 7.2
Maxsurf /T	Windows 8.5	Macintosh 7.2
Maxsurf Academic	Windows 8.5	Macintosh 7.2
Hydromax Pro	Windows 8.5	Macintosh 7.2
Hydromax /S	Windows 8.5	Macintosh 7.2
Workshop	Windows 3.5	Macintosh 2.2
Workshop /P	Windows 3.5	Macintosh 2.2
Prefit	Windows 8.5	Macintosh 7.2
Span	Windows 8.5	Macintosh 7.2
Hydrolink	Windows 8.5	Macintosh 7.2
Hullspeed	Windows 3.5	Macintosh 2.2
Seakeeper	Windows 1.5	Not Available
Multiframe 4D	Windows 7.5	Macintosh 5.2
Multiframe 3D	Windows 7.5	Macintosh 5.2
Multiframe 2D	Windows 7.5	Macintosh 5.2
Section Maker	Windows 7.5	Macintosh 5.2
Steel Designer	Windows 7.5	Not Available
Neoform	Windows 4.06	Macintosh 2.16

For more information of any of the products above, please contact us for a brochure, or see our web site at www.formsys.com.

Contact www.formsys.com

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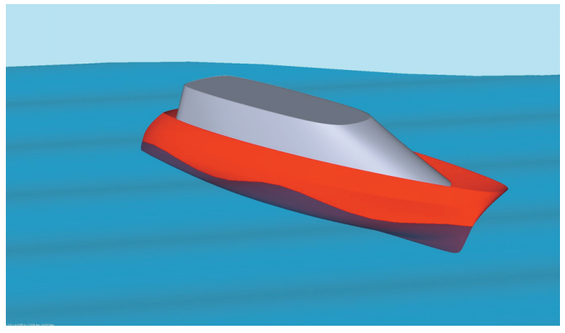
or Contact your nearest distributor

Maxsurf Version 8.5 Released

Formation Design Systems is pleased to announce the release of Maxsurf v8.5. This upgrade is part of our ongoing program of enhancements to the entire suite of Maxsurf software. If you are a member of our subscription program, you will automatically be receiving your upgrade CD. Should you wish to join the subscription program, please see the details listed on the back page of this newsletter.



Version 8.5 adds seakeeping visualisation to Seakeeper

Version 8.5 of Maxsurf contains a number of significant enhancements to the software including an innovative new technique for fitting surfaces to existing tables of offsets, display of background images, use of assemblies for grouping together sets of surfaces, tanks inside compartments, new seakeeping displays and lots more.

Surface Fitting

This version adds a new surface fitting function to Maxsurf which will be automatically activated inside Maxsurf when Prefit is installed. This function differs from the previous method used in Prefit in that it uses a Genetic Algorithm to optimise both the surface fit and net fairness. Although the new technique takes some time to run (usually overnight) it does result in very accurate fits and most importantly, much better quality control point nets.

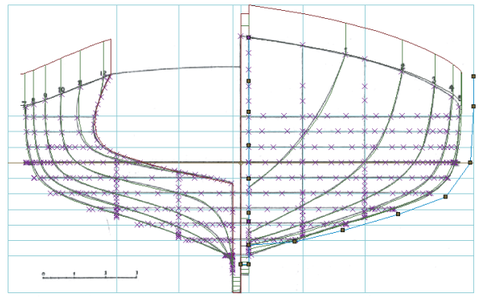
The Genetic Algorithm (GA) is an advanced optimisation method based on a simulation of the process of evolution. GAs are excellent for solving problems with large numbers of dimensions and constraints. The surface fitting problem falls into this category, as it is not sufficient to simply create a surface that is a close fit to the data points provided, it is also desirable that the surface be fair and that the control point net be smooth and regular. Formation is the first company that we know of to apply this technique to this problem and the results show a dramatic improvement over other methods we have reviewed.

Managing Markers

To assist in preparation of data prior to fitting, we have also added a range of improved tools for managing markers, even though with the new method there is no need to sort data prior to fitting. Included in these tools are functions for fitting a surface edge to a selected group of markers, snapping control points to markers, associating markers with particular surfaces and measuring surface errors from markers. The new Markers toolbar provides shortcuts to some of these functions.

Background Images

Maxsurf now has the ability to display background images in each of the design views. Those in the Plan, Profile and Body



Plan views may be re-positioned and resized to match the design and can then be used to assist in fairing to an existing design. The image in the perspective view can be used for presentation purposes by positioning your vessel in the background scene.

Maxsurf can load image files of the type jpg, gif, bmp and png. You will usually obtain these images by scanning a drawing using a flat bed scanner or perhaps from a digital camera. The images in all the views are independent so you can load a profile and buttock lines sketch into the Profile view, a picture of the sections into the Body Plan view and an image of the waterlines into the Plan view. There is also a similar function for displaying 2D or 3D DXF files in the background while you work.

Surface Assemblies

Surface Assemblies add to Maxsurf the ability to organise surfaces into groups, and to be able to create groups within groups. Each group of surfaces or sub-groups is referred to as an Assembly.

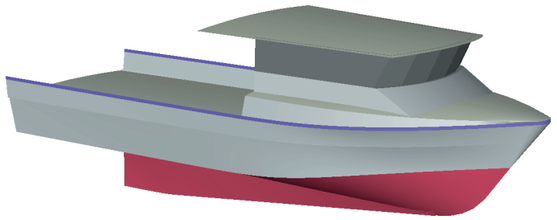
All functions relating to assemblies are managed in the new floating Assembly window. This window contains a tree view of the assembly which graphically represents the hierarchy of assemblies and surfaces.

The tree view has full support for inline editing, so names of assemblies and surfaces can be changed easily simply by double-clicking on the name. Surfaces properties can also be edited by double clicking on the name, which then brings up the surface attributes dialog box. You can also right-click on any item in the tree to modify it.

Drag and Drop support as well as right-click context sensitive menus make the Assembly window a very fast way to add, rename, move, hide, show, lock and unlock surfaces and assemblies. The Surfaces window now contains a column with the assembly name of each surface. You can sort by this column (Right-Click in the column header) to group surfaces together from the same assembly.

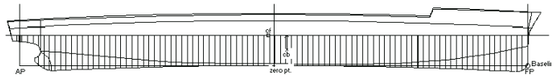
Rendering and OpenGL

Smooth shading rendering now uses the OpenGL 3D graphics standard used by most high end graphics cards. OpenGL provides faster, higher quality renderings, particularly where surfaces intersect and with trimming. OpenGL supports transparency and this may be specified on a surface by surface basis using the Appearances dialog in the Display menu.



Hog and Sag

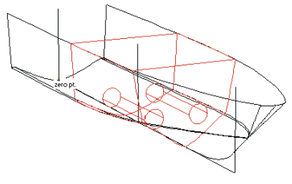
Hydromax now has an option to specify hog or sag to be included in calculations. When hog is specified the centre of the hull and frame of reference remain stationary while the ends of the hull are deflected downward. When sag is specified the centre of the hull and frame of reference remain stationary and the ends of the hull are deflected upwards.



Hog or sag is distributed in a parabolic curve centred around either the amidships location or a specified longitudinal position relative to the zero point. Hog and sag apply to all analysis modes including tank calibrations which will vary slightly as hog and sag change.

Tanks in Compartments

Hydromax is now able to model tanks which lie inside compartments. Tanks which are inside a compartment are linked to the compartment and specified as a negative volume. When the compartment is flooded due to damage, the negative volume which surrounds the tank is not included. For tanks which lie only partially within a single compartment, the negative volumes can be bounded by the limiting compartment boundaries rather than the whole tank.



Seakeeping - Remote Locations

Seakeeper now includes the capability to define as many remote locations as required. The remote locations are also displayed graphically in the design window and summarised in the Summary table in the Results window. For each remote location, the absolute and relative (to the wavy surface) motions, velocities and accelerations are calculated. Motion Sickness Incidence (MSI) and is now calculated at all the remote locations and displayed relative to ISO and BSI limits.

Seakeeper now also will estimate catamaran roll at moderate Froude Number, using a model of single demihull and specifying the transverse separation of the demihull centrelines.

User Profile - Incat Designs

Incat Designs is a company of marine designers based in Sydney, Australia, who specialise in the design of fast powered catamarans. The company is an offshoot of Hercus Marine Designs Pty Ltd founded by one of the "Fathers" of the fast vessel industry, Philip Hercus. While Incat Designs performed much pioneering work in the development of conventional catamarans, they are best known for their invention and development of the highly innovative Wave Piercer design.

Construction of Incat Designs catamarans has been carried out in shipyards in many countries including Australia, New Zealand, Singapore, USA, United Kingdom, Hong Kong, Japan and Canada. Vessels are in service in 26 countries. Since 1998, Incat have used Formation software for design and analysis of their vessels and utilise Maxsurf for hull and superstructure modelling, Hydromax for intact and damaged stability analysis, and our Multiframe software for structural analysis.

Incat Designs continues a very active research and development program including work on a potential new class of high speed freight vessels. In 1997 Incat Designs - Sydney completed a concept design for a vessel capable of carrying 1300 tonnes of containers over 1500 nautical miles at a service speed of 40knots. A long-range version of this vessel will carry 1200 tonnes over 3000 nautical miles at 39 knots.

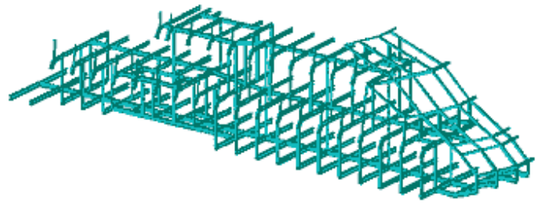
As well as their use of Maxsurf, Incat Designs makes extensive use of Formation's Multiframe structural analysis software. Used in conjunction with AutoCAD for defining structural

HERCUS MARINE DESIGNS

INCAT DESIGNS - SYDNEY

geometry, Multiframe allows the design team to perform the structural design of superstructures as well as hull structure. The Multiframe structural model allows preliminary sizing of members to take place to ensure that DNV requirements are met. These models include use of springs to simulate stiffness of supporting elements and can be as complex as the 1640 member 3D model shown.

From the initial model, data is copied and pasted into detailed design spreadsheets which perform detailed checks for varying



section types. Over time, Incat Designs have built up substantial extensions to Multiframe's structural shapes database to cater for the many custom fabricated sections used in marine applications. The combination of AutoCAD, Multiframe and Excel gives the team a comprehensive range of tools for global and local design.

More information on Incat Designs can be found at http://www.incatdesigns.com.au