



Tunnel Boat Design Program, Version 7

New in Version 7.8

- [New Program Features](#)
- [New Design Features](#)
- [New Analysis Features](#)
- [New Design-versus-Design Compare](#)
- [New Vee-bottom hull Lift/Drag Calculator](#)

Since the **TBDP®** was originally released, we have received many acclamations for the unique, powerful and efficient capabilities of the **TBDP®**. We have developed many of the requested additional features and options from some of our most ardent users, and have incorporated them into the **NEW TBDP® Version 7**. In particular, check out all the new [Design Wizards!](#)




Here is a brief summary of the powerful new additions to **TBDP® Version 7...**

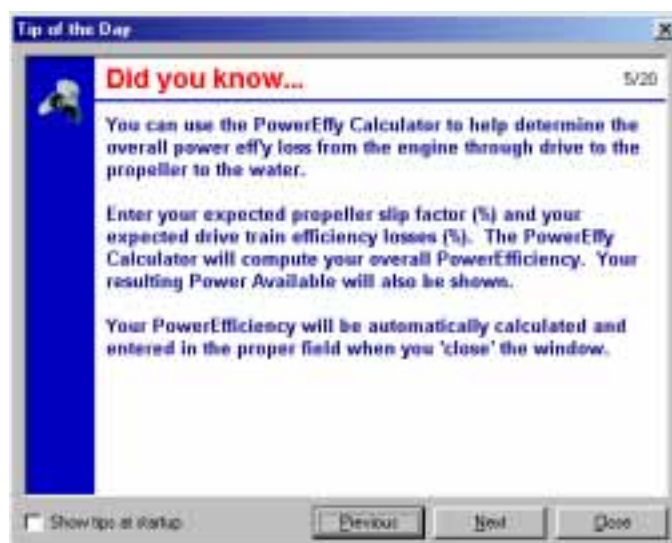


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New Program Features

Now Include...

- Full Windows 98/98se/2000/NT/2000/NT/XP compatibility, with easy "point & click" mouse access, data entry and program operation.
- **Imperial or Metric Units** feature, with automatic conversion of all input & output data with click of button.
- **Automatic Data Validation** feature makes it easy to check data while you are creating your design, and you turn it on/off with a switch. 
- Even more **On-Line WINHELP** screens (70+ pages), with Context sensitive access, Search and easy to use Help Index, all with samples of actual screens and even suggestions for how to apply the topic to your design.
- **Tips of the day** shows design and performance improvement tips. Help on how to use TBDP to its greatest extent.
- **Database file management** routines are easy-to-use "cursor-select" functions, with design file copy, defaults and modify routines, active file rename and description notes, stored in database, making storage and retrieval of your designs easy-to-use, with sorting and even a file search function.
- **File grouping**, copying, deleting, default design file creation and easy text-box editing of file names and file descriptions are features of the File Management routines. Now with "Save-As..." feature to keep files of design groups with unique naming conventions.
- More **On-Line pictures of design features**, dimensioning standards and option selections make it easy to see the key features of your design, and you turn them on/off with a switch.



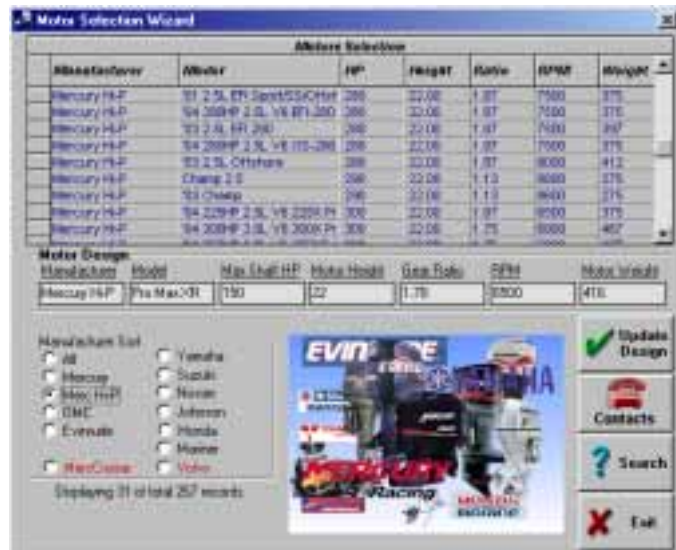


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New Design Feature Additions

Include input, detailed analysis and output for...

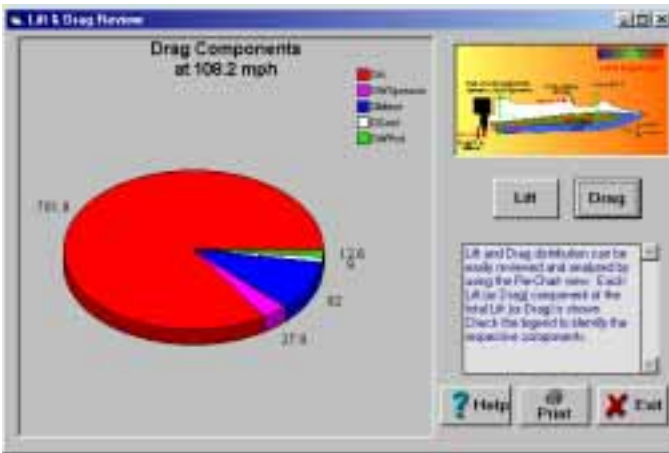
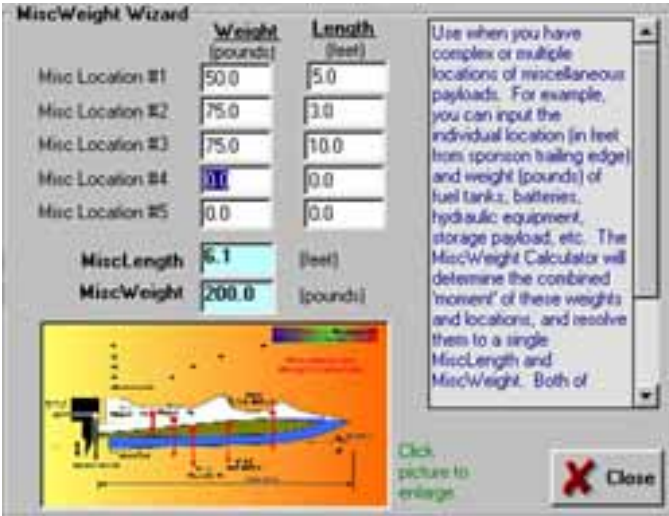
- **Nine (9) New Wizard Design Features**; New Motor Selection Wizard; Miscellaneous Weight Wizard; Angle Increment Calculator; Quick Design Wizard; WAngle Calc Wizard; Deadrise Wizard; Power Calc Wizard; Velocity Calc Wizard; Propeller Wizard; and an Expanded Wizard Tutorial. And a new Quick Lift Calculator.
- **New 2005 Motor Design Wizard** to easily input the dimensional information for your setup. Just select your OEM engine manufacturer and highlight your model from the **over 350+listed**. The published manufacturers specifications are all there - correct Maximum HP, Height, Weight, RPM and gear ratio will be automatically input to TBDP.
- **Deadrise Wizard** - If you don't know the deadrise angle of your sponsons, use the *Deadrise Wizard* to determine the angle of the deadrise of your sponsons or center pod running surface. Just input the height measured at the outside edge and inside edge, and the width of the running surface (pad) - the Calculator will determine the angle and automatically transfer to the input field.
- **Quick Design Wizard** makes it easy to obtain a





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generalized design by selecting one of the 'standard' performance tunnel hull and power catamaran design styles. The dimensional and setup design arrangements for your selected hull type will be automatically applied to all the design input fields. Quick Designs for recreational offshore catamaran, recreational tunnel hull, Offshore racing cat, Mod-VP drag hull, F1-style tunnel racer, recreational hi-perf Mod VP hull, ZapCat tunnel inflatable - even RC model tunnel hull.

- **Propeller sizing** approximation can be obtained based on your motor specifications. Engine RPM is predicted by TBDP7 based on your design, setup parameters and operating performance; your predicted propeller pitch is calculated and displayed with recommendations.
- **Lift and Drag distribution** can be easily reviewed and analyzed by using the 'pie-chart' view. The percentage (%) of each Lift (or Drag) component of the total Lift (or Drag) is shown. Check the legend to identify the respective components.
 
- **Aerofoil shape** and configuration alternatives are available, based on extensive research using NACA shape characteristics, thickness, aspect ratio, height above surface, with tunnel hull configurations and loadings.
- Use the **Miscellaneous Weight Wizard** for complex or multiple locations of payloads. Input the individual location and weight of fuel tanks, batteries, hydraulic equipment, storage payload, etc. The MiscWeight Calculator will determine the combined 'moment' of these weights and locations, and resolve them to a single
 



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MiscLength and MiscWeight.

- **PowerEffy Calculator** to help determine the overall power efficiency loss from the engine through drive to the propeller to the water. Just use propeller slip factor (%) and your expected drive train efficiency losses (%). The PowerEffy Calculator will compute your overall Power Efficiency and your resulting Power Available.

Power Efficiency Wizard

Propeller Slip (%) 0.10 (0.0-1.0)

Transmission Loss (%) 0.00 (0.0-1.0)

PowerMax 200.0 HP

PowerEfficiency 0.90 (%)

Power Available 182 HP

Your propeller effy is 90% and your transmission power effy is assumed to be 100%. Input your engine/drive power characteristics.

You can use the PowerEffy Calculator to help determine the overall power efficiency loss from the engine through drive to the propeller to the water. Enter your expected propeller slip factor (%) and your expected drive train efficiency losses. The PowerEffy Calculator will compute your overall PowerEfficiency.

Close

- **Results Wizard** presents an analysis summary for each optimization scenario, highlighting specific design/performance recommendations to review for improvements.
- Even More Built-in **Lower Unit/Drive design function**, including over 20 high performance drive designs (including outboard lower units, I/O outdrives and even 'surface drives') built in, for you to select from – or design your own on-line.
- **Performance and Stability** is now even more effective - your tunnel hull design analysis now considers effects of Center Pod, multiple sponson steps, selectable aerofoil shapes, cockpit configurations - even single or multiple drive train configurations - and lot's more!

Acceleration & Elapsed Time Wizard

Total Distance Traveled in 11.25 seconds is 1955.6 feet for .3 miles for an average velocity of 93.9 mph

Maximum velocity was 108.2 mph

(Note: these elapsed times and distance traveled is approximated, and is best used for comparative design and performance optimization)

The biggest change in Time was 6.88 sec or 11.7%, between 98.4 mph and 108.2 mph

Aerodynamic Lift is a very high (99.9%) percentage of Total Lift. This can result in high dynamic instability, you may wish to make design changes to increase sponson lift to improve size of instability.

Above are only snapshot results of a few variables, you may wish to consider how these results can affect performance.

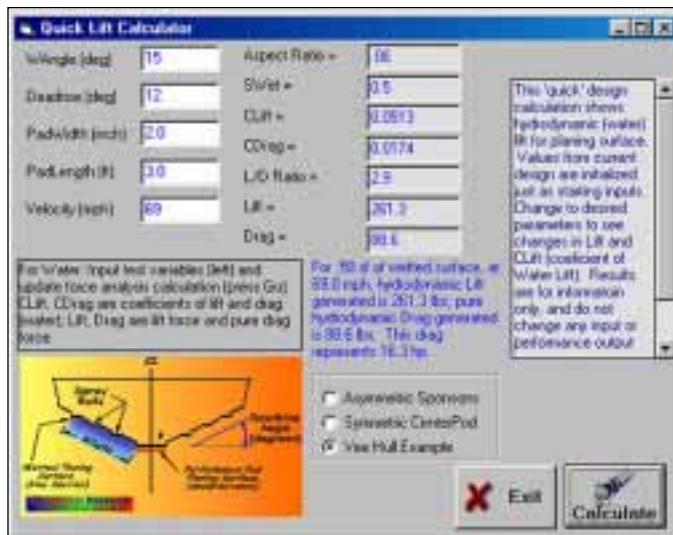
Details Done





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- The NEW **Quick Lift Calculator** shows hydrodynamic (water) lift for any planing surface you describe to it – easy for quick analysis of design configuration alternatives.
- AND NOW – OUR USERS ASKED FOR IT...AND NOW YOU'VE GOT IT...Vee-hull Lift, Drag, Coefficient & HP calculations are done by the QLC! Vee-hull or Vee-Pad configurations** for any deadrise (including zero deadrise pads), any angle of attack and any velocity.



And Dozens more NEW design features & options

- Get actual **Aerofoil dimensions** using the **Aerofoil Dimensions View** feature. The lengthwise (chord) location and upper/lower dimensions of the aerofoil are shown for your design, automatically calculated for your chord length, wing thickness and aerofoil type selection. You can use these dimensions to analyze or draw an actual template of your wing design.
- Print the **easy-to-use data input form**, to simplify data and dimension collection. All required dimensional inputs are listed in an organized sequence, with an easy location to write in your boat's information. It is then easy to transfer this information to your TBDP7 data input screens.
- Advanced Sponson Step design feature** for running surfaces, with new special added algorithms for hydrodynamic lift, drag and coefficient specifically developed for tunnel hull performance analysis. Includes single or multiple step configurations.

New Analysis Features

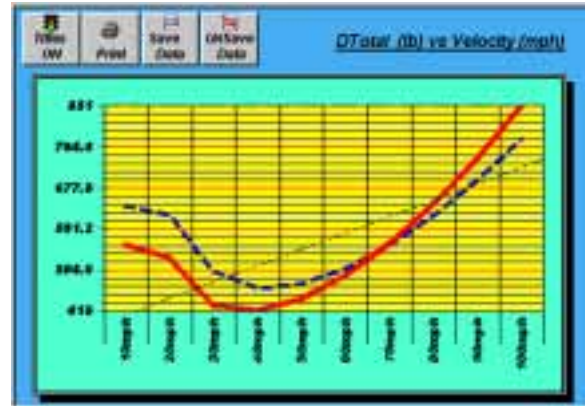
Additions include...

- New **metric/imperial design** dimensions selection; including automatic conversion of all input data and performance data from one units to the other.
- New **Automatic BlowOver check** – too much angle of attack (WAngle) can create a condition of greater lift than weight, causing blow-over. A new feature will check for this condition, if you desire, and correct the WAngle during a Velocity Optimization performance check.
- New **Automatic WAngle increase** – when doing a Velocity Optimization performance check, a new feature will test, if you desire, for all angles of attack (Wangle) for maximum velocity condition.



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- Even more detailed **Analysis Summary & Recommendations**: New analysis summary presented for each optimization scenario, highlighting specific design/performance areas to review for improvements. Now addresses each key part of your design's performance.
- New **Design-versus-Design Comparison Graphics** feature – use this great new feature to “remember” all the performance characteristics of your base design, then input your design change(s) and view how the new results compare. Makes it EXTRA “Graphically” EASY to see exactly how the design changes affect performance in all areas.
- New **Automatic Data Validation** feature will check each of your 50+ input variables to required input parameters. Includes feature switch to turn off if desired to try a "really radical" design feature.





And...if you're working with an *older version*....all these features are still there!

What's new in Version 6

- **New Program Features**

- Your Company and User Name signature on Start-up splash screen, password protected, coded to install
- On-Screen Setup routines to allow custom user-configuration of window & screen colors, font designs and colors, sounds and alarms.
- The Report Printer sends your design input and output reports to any Windows compatible printer. You have complete control through the print Setup screens. Progress Bars tell you status of printing, and there's full windows error checking for your printer hardware status
- Time and Date stamps are attached to each file, to allow identification of even minor design changes to stored files. An indicator reminds you when you have made a change to a previous design.
- REPORT GRAPHICS PRINTING- Now includes color printing of 34 different performance graphs
- Full GRAPHIC presentations on-screen for viewing the key features that you have selected, with colour photo presentation of many design feature representations.
- Direct access to AeroMarine Research's WWWeb site from TBDP© and AR's web page for latest info on tunnel design features.

- **New Design Features**

- TBDP Now includes **color printing** of 34 performance graphs!
- Simulate performance with different step design using the **Step Selection** design frame. Standardized design integration of your steps are created when you select "No Step" or "One Step" or "Two Steps". You can even locate the step on the running surface, and specify the depth of the step.
- Accurate top speed prediction, new acceleration models, angle increment calculator, velocity range calculator, acceleration modelling with elapsed time prediction, motor height calc's.
- 34 Color graphic performance charts - and all the functionality of Windows 98/98se/2000/NT/2000
- Water Type selection allows for salt water or fresh water running conditions.
- Altitude selection accounts for operating altitude.
- Cockpit/Fairing design, including fully enclosed canopy-style, "safety-cell" cockpit or open cockpit, providing complex aerodynamic lift and drag analysis.



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- Mod-VP style hull design Option with detailed center-pod design configuration input, and specific "pod" performance analysis output for lift, drag and coefficients.
 - Center Pod Height - Includes design analysis of relative pod heights between outboard sponsons and centre sponson pod.
 - Aerofoil Selection from five (5) different configurations allowing unique, complex aerodynamic hull designs.
 - Graphic presentation of aerofoil shapes allows viewing of detailed dimensional design information for the aerofoil that you have used in your design.
 - Aerofoil Center Of Pressure is now calculated with a new, highly accurate algorithm, developed to identify changes of CP with specific aerofoil designs and changes in angle of attack. These key performance predictions are also presented in Graphic presentation format.
 - Spray Rail compensation is now included in calculations for hydrodynamic lift and drag, allowing you to see the performance impacts of adding or positioning sponson spray rails on sponsons and center pod.
 - DelStab calculates the difference between Centre of Pressure and the Dynamic Centre of Gravity, for easy Stability evaluation. This is a critical design feature for stable hull performance evaluation.
 - Height Of Dynamic Center Of Gravity (YCG) is now calculated with a new highly accurate complex algorithm, based on detailed design input data.
 - Aerodynamic Lift/Drag Calcs now include interactive effects of selected aerofoil configuration, and complex aerodynamic influences with Cockpit fairing area designs.
 - Multiple Drive Unit selection capability for multi-engine configurations.
 - Your tunnel hull design analysis now considers performance and stability effects of Center Pod, multiple sponson steps, selectable aerofoil shapes, cockpit configurations - even single or multiple drive train configurations - and lot's more!
- **New Analysis Features**
 - New Power Optimization feature for design analysis configuration allows for analysis of all performance indicators as your hull design accelerates through selected velocity ranges.
 - Acceleration Projection - a new dynamic acceleration analysis now shows incremental accelerations and Elapsed Time for every step through the selected velocity ranges. These key performance predictions are also presented in Graphic presentation format.
 - New Power Optimization feature for design analysis configuration allows for analysis of all performance indicators as your hull design accelerates through selected velocity ranges.



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- Acceleration Projection - a new dynamic acceleration analysis now shows incremental accelerations and Elapsed Time for every step through the selected velocity ranges. These key performance predictions are also presented in Graphic presentation format.
 - More Performance coefficients - now individual Lift and Drag coefficients for cockpit, sponson pads, center pod, and appendages are calculated and shown on Performance Output Screens/Reports. Center Pod setup parameters now also include the relative position of pod running surface to the sponson pad running surfaces.
- Multiple Performance Output Screens - two (2) full pages of Performance Output information, at ten (10) steps of velocities through your operating range. Output of predicted performance data includes more performance coefficients, design loads and weights, and individual Lift/Drag contributions of hull components and Design Features. Screens are easily accessed through file tabs, and are included in all Report printouts.
- Graphic Analysis curves are now presented for every (34) output variable, including the new DelStab variable, showing the difference between Center of Pressure and the Dynamic Center of Gravity, for easy Stability evaluation.
- Detailed Performance Range - Analysis now presents 10 velocity increments, for even more detailed analysis capability.
- Maximum Speed Prediction: new algorithms support accurate top speed prediction, particularly helpful for drag boat design and performance optimization.
- Angle Increment Calculator – a user friendly on-screen calculator makes the input of AngleInc design variable (Angle of Attack of aerodynamic wing) easy, with the Angle Increment Calculator,
- Velocity Range Calculator - a user friendly on-screen calculator makes the input of specific Velocity incremental Velocity examinations easy, with the Velocity Range Calculator
- Motor Height – new user-input variable allows for different settings for motor height (lower unit bullet placement), with impacts on performance and stability calculated automatically.