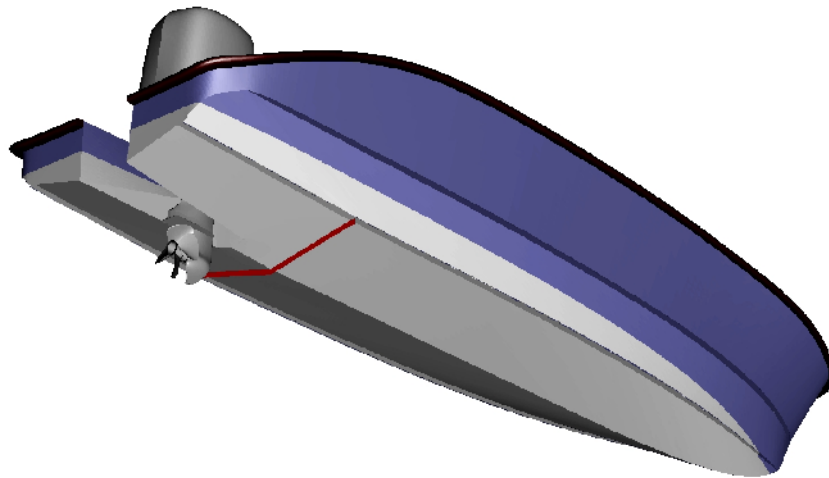


## An optimized motor boat with aftship interceptor

To every boat builder and boat designer appears the dream of the ultimate boat sooner or later. It's all about optimization at all times. Although I have for many years been fascinated by the vision of the ultimate motor boat. The aim was to provide a boat with high efficiency and smooth operation over a wide speed range

One of these projects was the boat with a low deadrise and double chines to get good seakeeping and to be effective over a wide speed range. Another project was a boat with midship interceptor to halve the energy requirements. A third project was to create a hull shape that would be more effective than the traditional Pettersson boat.

Based on the positive results from these and other projects were a vision born for an optimal boat for a very wide speed range. The boat would have an extremely low power requirements and go soft in seaway.

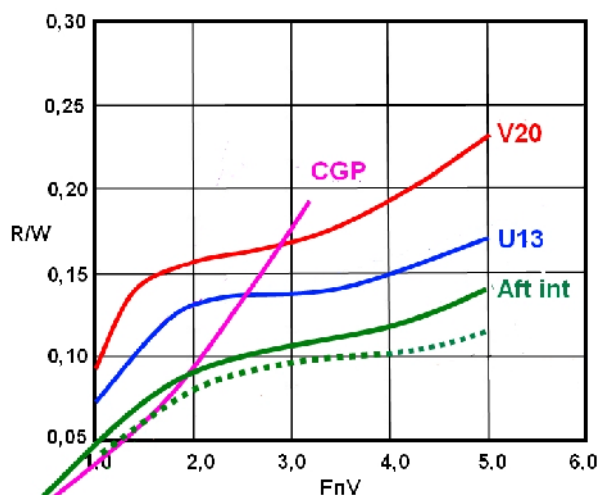
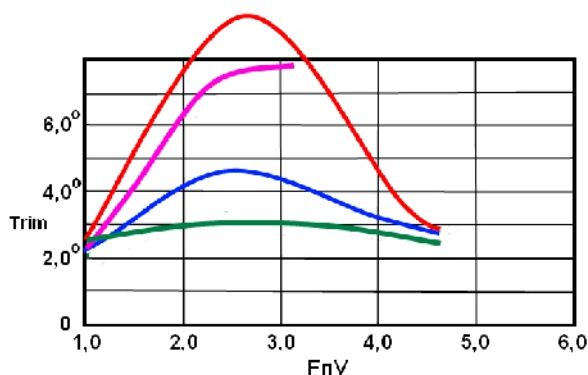


The sketch is based on a boat with dimensions 6,6 x 2.0 meters and a maximum total weight around 1.2 tonnes. The technology can be used in all sizes of boats.

In the lowest speed range around eight knots, the boat is optimized as a displacement boat with a long waterline, a small transom, minimal wetted surface and optimized center of gravity. This results in small wave making drag and very low trim angle. In order to run with seven knots are about seven horsepowers required at 65% efficiency.

In the middle speed range will the aft placed interceptor come to work. The surface aft stays completely dry. The boat is thereby a planing boat with optimized dimensions for efficiency and soft ride. Thanks to the advantageous proportions the trim angle do not change appreciably, as in an ordinary deep V-hull. At twenty knots about thirty horsepowers are required.

In the highest speed range the adjustable interceptor works so that power requirement is reduced by one-third of what an equivalent normal boat would need. At thirtyfive knots are sixty horsepowers required. A corresponding normal boat with a deep V-bottom, **V20**, would need about double that.



0,3 ton	5 kn	10	15	20	25	30
1,0 ton	6 kn	12	18	24	30	36
5,0 ton	8 kn	16	24	32	40	48
10 ton	9 kn	18	27	36	45	54

## Examples of comparable boats

### V20

3,6 x 1,5	0,3 ton
5,6 x 2,0	1,0 ton
9,6 x 3,3	5,0 ton
12,0 x 4,0	10,0 ton

### U13 Aftship interceptor

4,1 x 1,3	0,3 ton
6,2 x 1,9	1,0 ton
10,7 x 3,1	5,0 ton
13,4 x 3,8	10,0 ton

The above diagram shows the drag in relation to the boat's total weight,  $R / W$ . Also shown is the trim angle at different speeds. Below the graph is seen respectively speeds depending on the boat's total weight. The values of **V20** and **U13** are from a previous report. The boats with **aftship interceptor** are measured values from conducted model and full scale tests. In addition to this it is also seen the measured values for the corresponding round-bottomed displacement **CG Pettersson**-boats.

Overall, we can create a boat that can be fitted with a smaller engine than what is normal and thus the total weight is further slightly lower than that required in an ordinary boat. Note that the boat in this study from the outset is about twenty-five percent more efficient than a boat with a deep V-bottom, such as **V20**. This has been reported in detail in a previous study, which is available on the website.

Two 1.2 meter models with different loads were tested. In 2012, a 5.5-meter prototype been converted and tested to see how the different components can work together for optimal results. The tests have confirmed the assumptions. The results are guidelines for calculating the qualities for boats of all sizes and speeds.

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5,5 meter boat with midship interceptor 19,3 knots with 8,0 hp



**U13** 6,6 x 2,0 1,2 ton



**V20** 6,2 x 2,2 1,2 ton

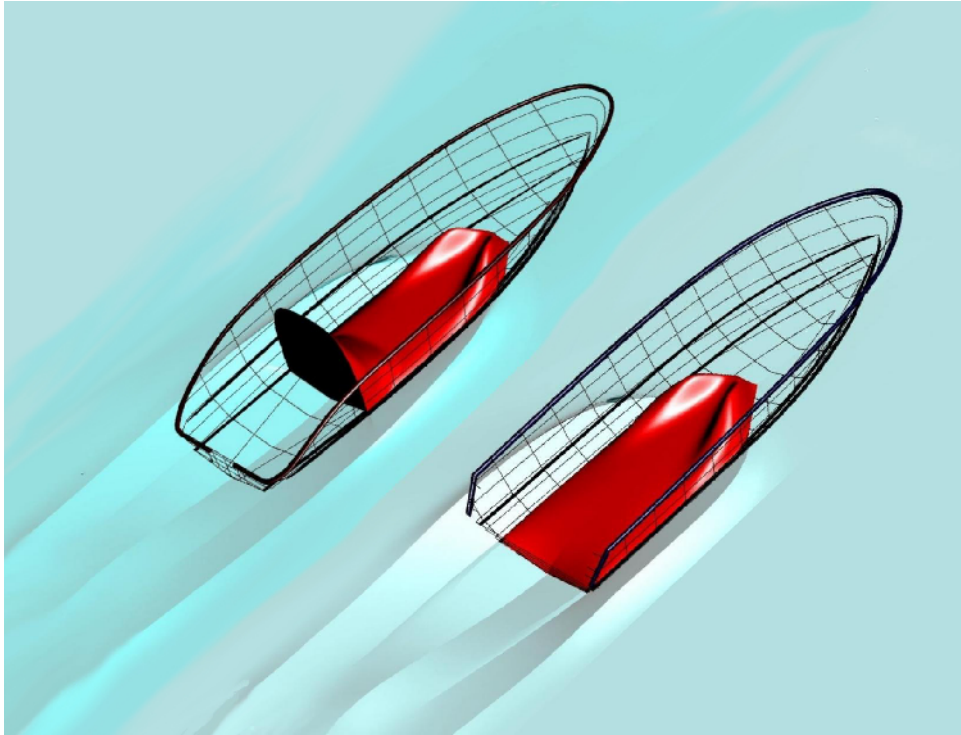


1,2 meter model with **aftship interceptor**

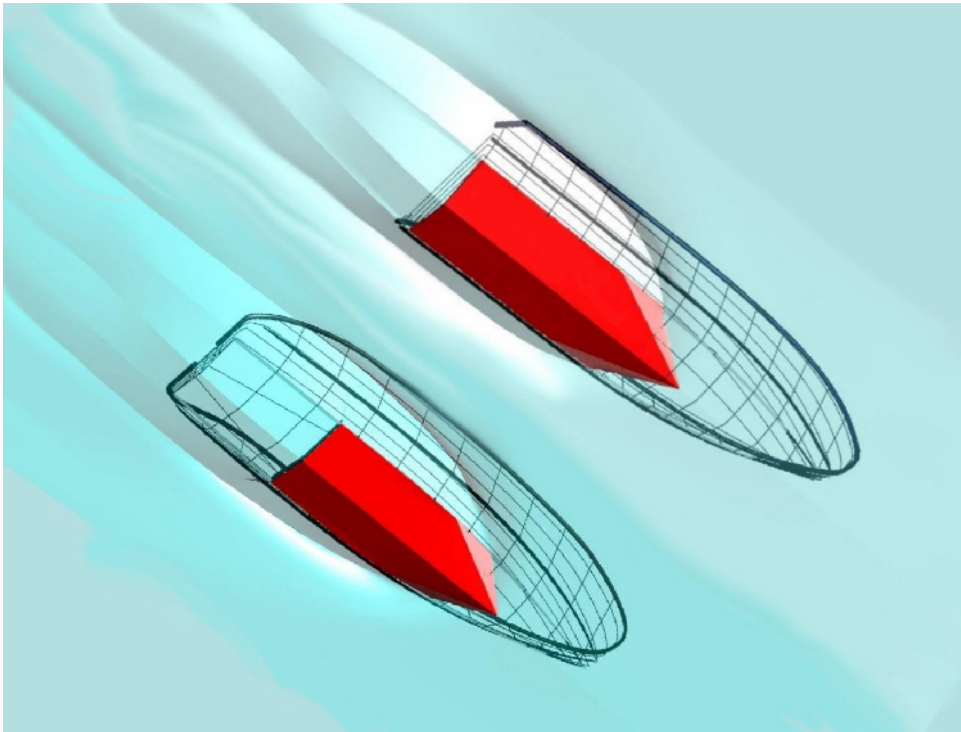


5,5 meter test boat with **aftship interceptor** in October 2012





Lift distribution with and without **aftship interceptor**



Wetted surface with and without **aftship interceptor**