PSP

Propeller Series Package

The diagrams of the Wageningen series were made available long ago by the N.S.M.B. in the form of large scale diagrams. This large scale was necessary to obtain the required accuracy of the readings. The various types of diagrams, such as *Bp* - δ diagrams, were used to reduce the number of readings in specific design problems.

The use of computers changed the way in which the diagrams were used.

The generation of polynomials made the diagrams available for use in computers.

Programs were made both by MARIN and by the user, generating optimised propellers from the polynomials. The user very often discovered that programming and verifying the polynomials was a time consuming work. Also the drawback of these programs is that they act as black boxes to the designer. The user has no idea about the various sensitivities in the optimisation process. Nor can he play around to become familiar with the problem.

The CD, delivered with this book, contains the latest version of the polynomials. In a way the use of the program is equivalent to reading the diagrams. This makes it possible to use small scale diagrams, such as provided in this book, without reduction of the accuracy. The layout of the screen is such that the program also replaces the alternative diagrams such as the Bp - δ diagrams. This is done by displaying not only the values of J,Kt,Kq and η, but also the values of Kt/J2, Kt/J4, Kq/J3 and Kq/J5. After displaying the proper diagram (number of blades and blade area ratio) all other values are displayed in the screen when the pitch ratio and one of the other values is given.

This makes it possible to give the value of J and read Kt and Kq, which is the normal way of reading the diagrams. But it is also possible to give e.g. Kt and read the corresponding value of J. It is even possible to give a value of Kq and read the corresponding J, Kt and other values (in that case only the part of the efficiency curve before the maximum efficiency is used).

These features can also be used for e.g. Kt/J^2. The propeller revolutions n are eliminated from this parameter and this parameter is therefore used when the propeller rotation rate is unknown. By giving the value for Kt/J^2 the corresponding value of J and the other parameters are given. This is equivalent to using the Bp - δ diagrams and this feature, therefore, eliminates the need for these diagrams.
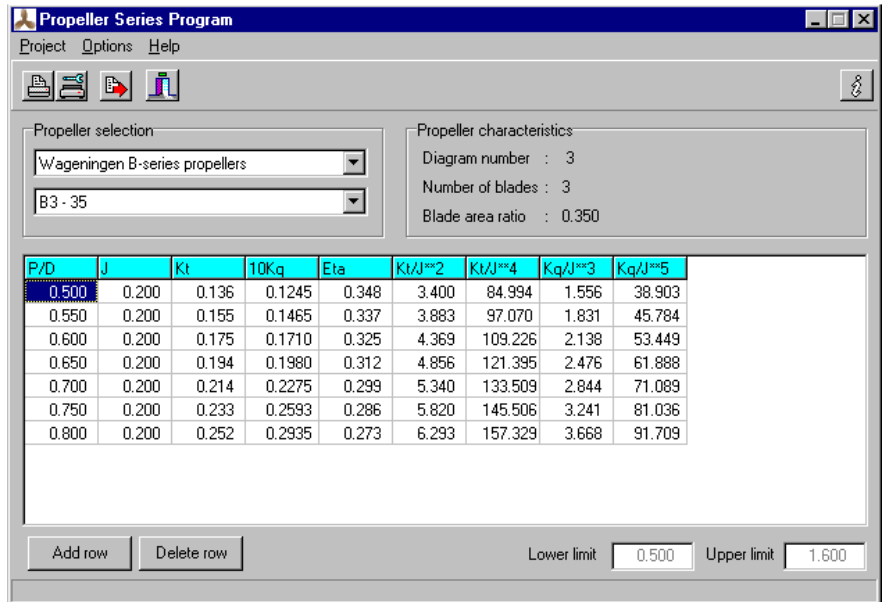
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