How do we design a small transformer?

Concerning the mouse and the control buttons

You can use the mouse for everything.

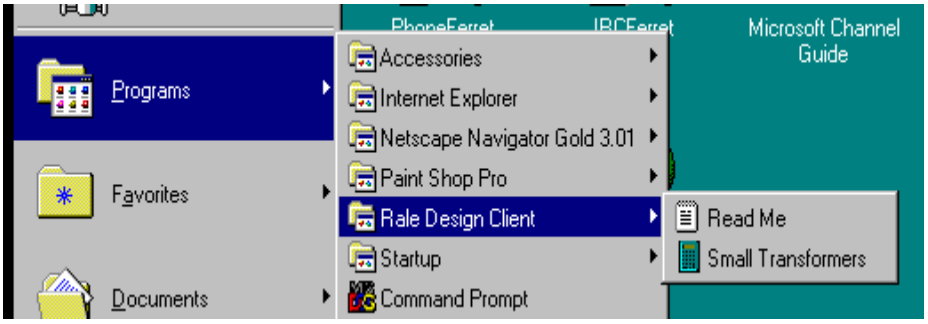
The menu control can also be activated by means of the **Alt** key and the control letter for the menu option (after pressing the **Alt** key, it is normally visible in a different color). Some important menu options can be activated by means of the **F keys**.

Here is a survey of all control keys:

F 1	On-line help
F 2	It loads your last input file into the input mask in which all of the input data and the results of design are stored
F 3	Loads the standard input from the user (Reset)
F 4	Starts design from the input data form
F 5	Activates the test mode. This button cannot be pressed until after completion of design
F 6	Designs in the test mode
F 7	Indicates the loaded or calculated output data
F 8	Prints out the loaded or calculated output data
F 9	Activates the choice of core family and core with bobbin, and starts manual inputting of core, bobbin and casing
F 11	Activates the choice of steel quality
F 12	Activates the choice of wire family and wire
Ctrl-F1	Activates help for on-line help
Ctrl-Z	Reverses the last input
Ctrl-X	Stores all input data from a secondary into the internal memory. The cursor should be located in an input field of the secondary to be copied
Ctrl-C	Overwrites the input data of a secondary with the input data from the internal memory in which the cursor is located
Ctrl-V	Joins the input data from a secondary with the input data from the internal memory in which the cursor is located. The input data of the 8th secondary will consequently be lost
Ctrl-D	Deletes the selected secondary winding
Arrows	Steps between the input fields in the input form and in the test mode
TAB	Steps between the input fields

Run RALE DESIGN System for small transformers

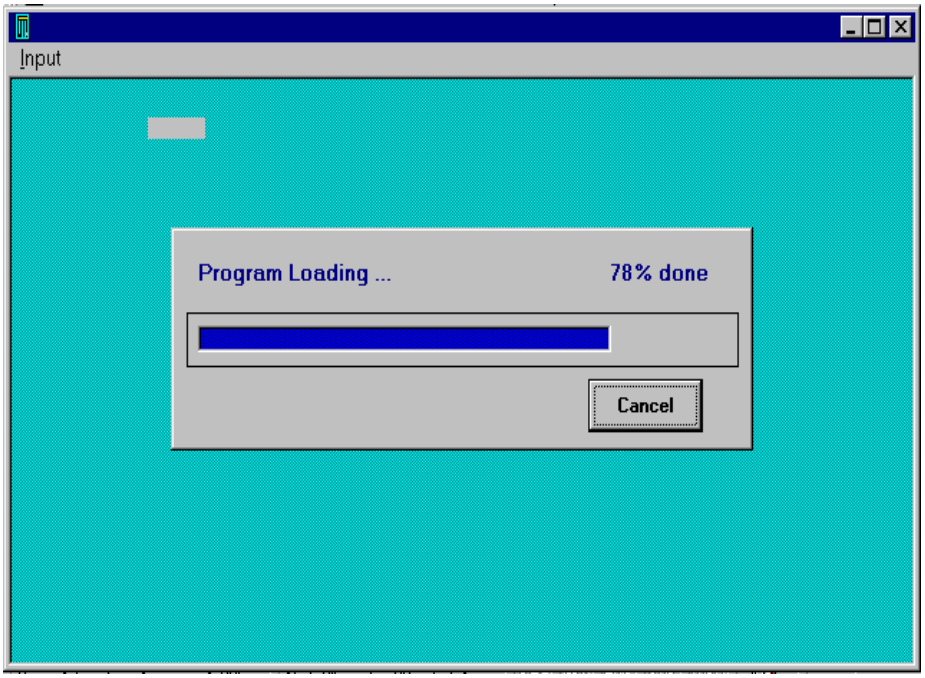
After installation of the **RALE Design System** , you see the ***Rale Design System*** program group on-screen***.***



Click on the **Small Transformers** bottom

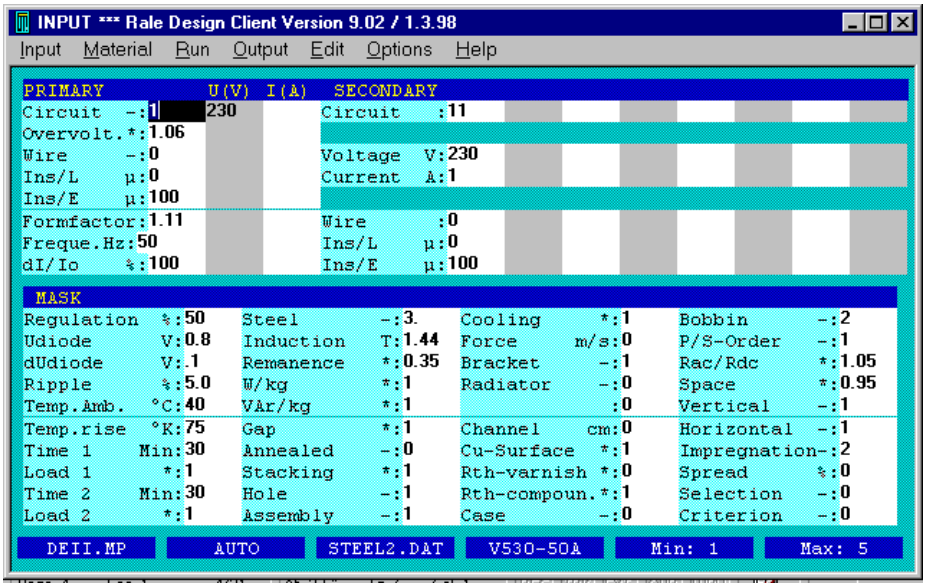
After clicking on the ***Small Transformers*** bottom, the main menu for the Small Transformesr Program will appear on-screen.

*Click on the icon **/Small Transformers** or press Enter**.***



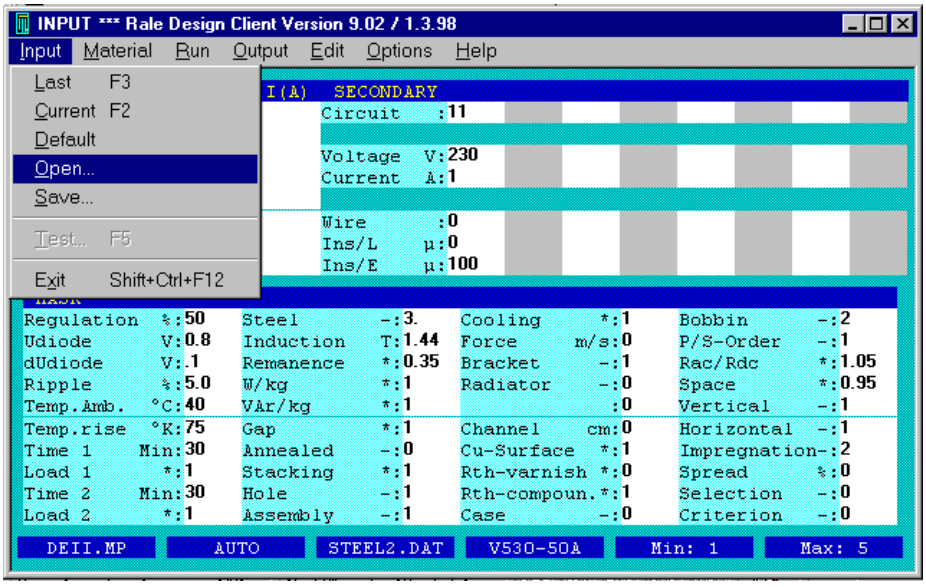
This is followed by the input mask on screen with your input data

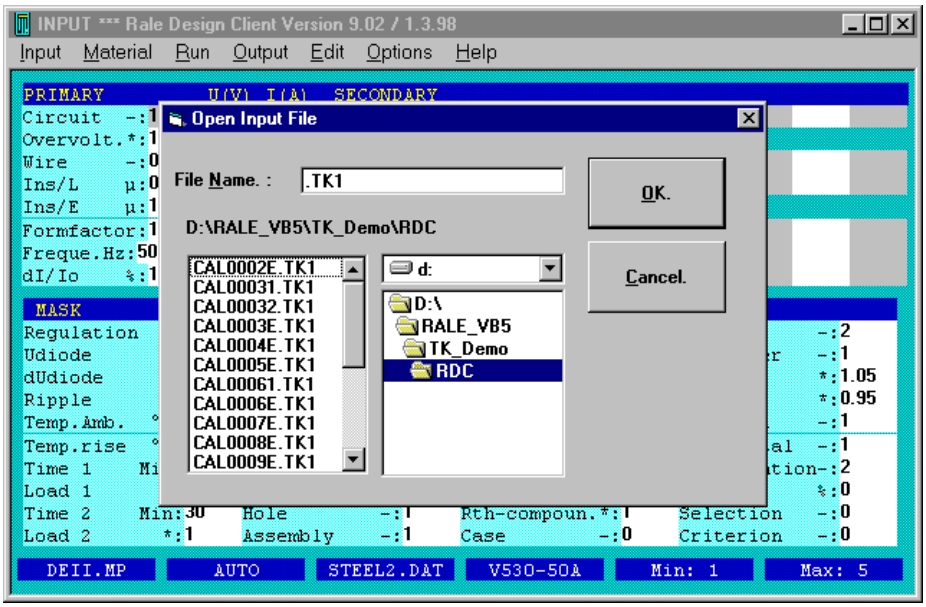
Input mask



(Numerical Characters =>Inputting), (Arrow, PgUp, PgDn, Mouse =>Move)

Your last input file will be loaded into the input mask. Here, you can create your input or incorporate the input data from an input data file and thus achieve drastic acceleration in the procedure for filling-in of the input mask.





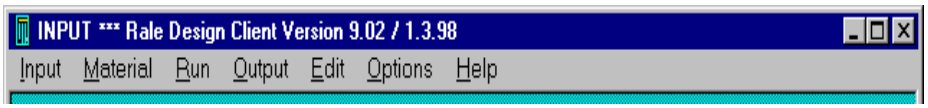
(TAB=>Steps), (Click=>Marks), (Double click=>Selects)

In the installation of the Rale Design System, a RALE library of input data files has also been installed..

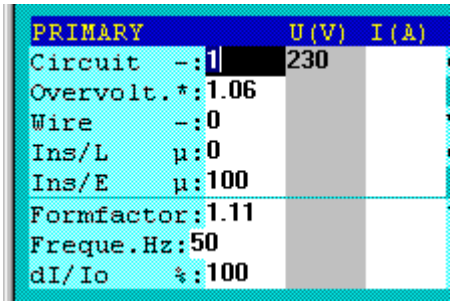
Input

The input mask consists of 5 areas:

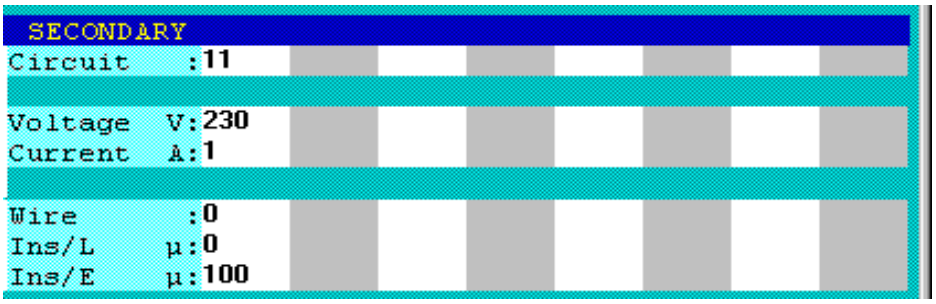
1. Menu bar.



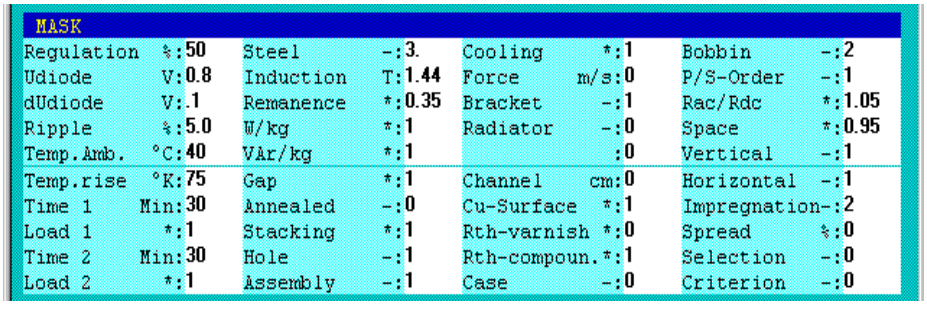
2. Input form for primary data.



3. Input form for secondary data.



4. Input form for general technological parameters.



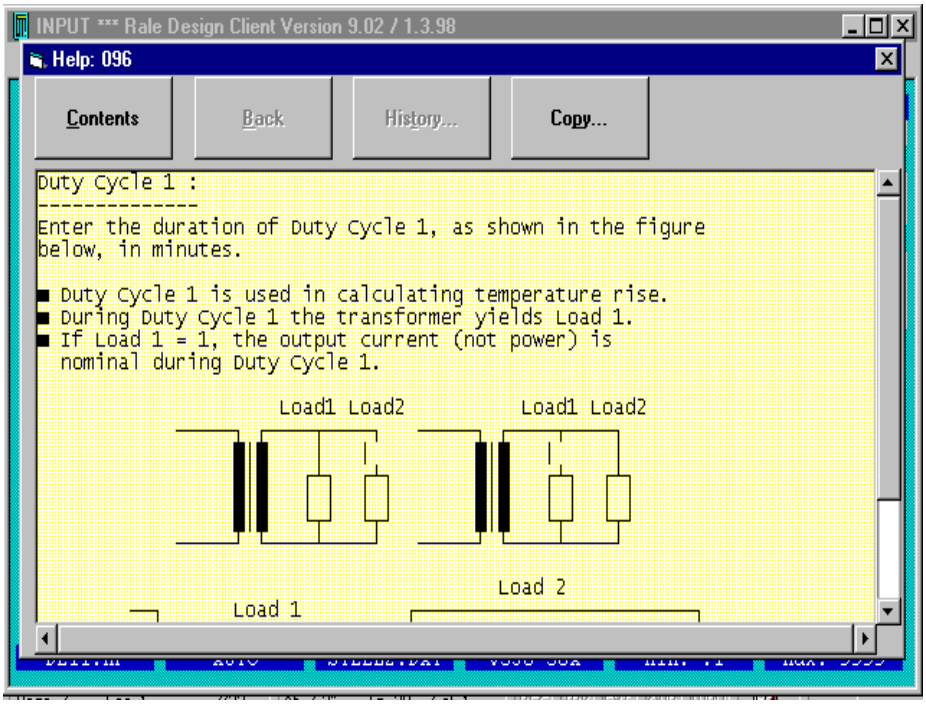
5. Status line

The 6 fields of the status line indicate, in sequence, the core family, the core, the iron quality family, iron quality, and the minimum and maximum values of the current input.

The input process for primary voltages and the secondary windings is concluded by means of the **PgUp** or **PgDn** keys

On-line Help

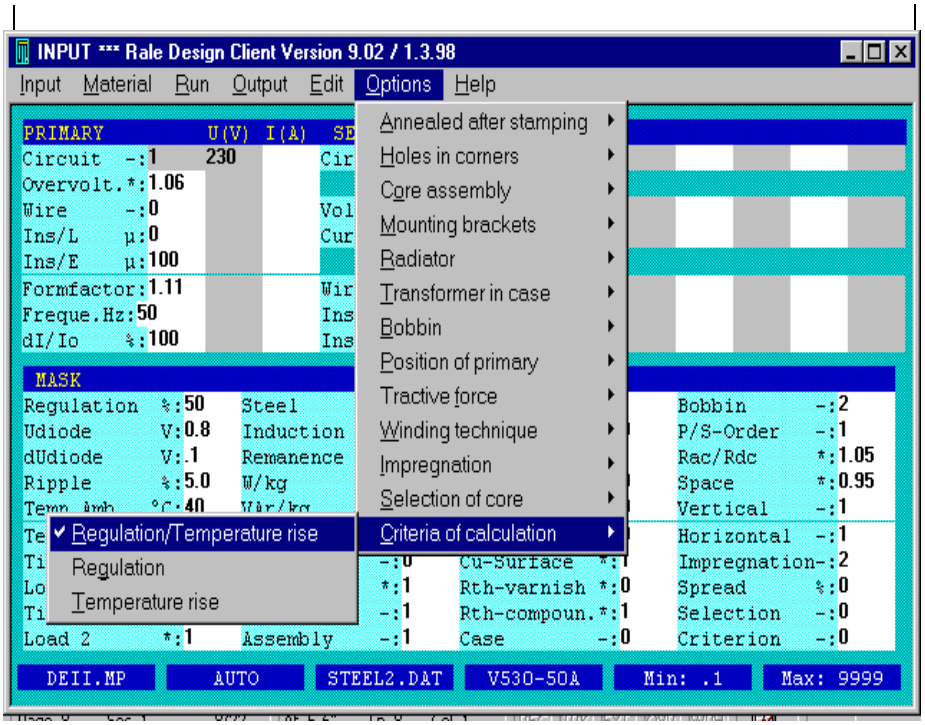
Key **F1** plays an important part at this point, because each input field has a help text. Use **ESC** to quit on-line help.



(Mouse, PgDn, PgUp, Arrow =>Move), (ESC=>Exit)

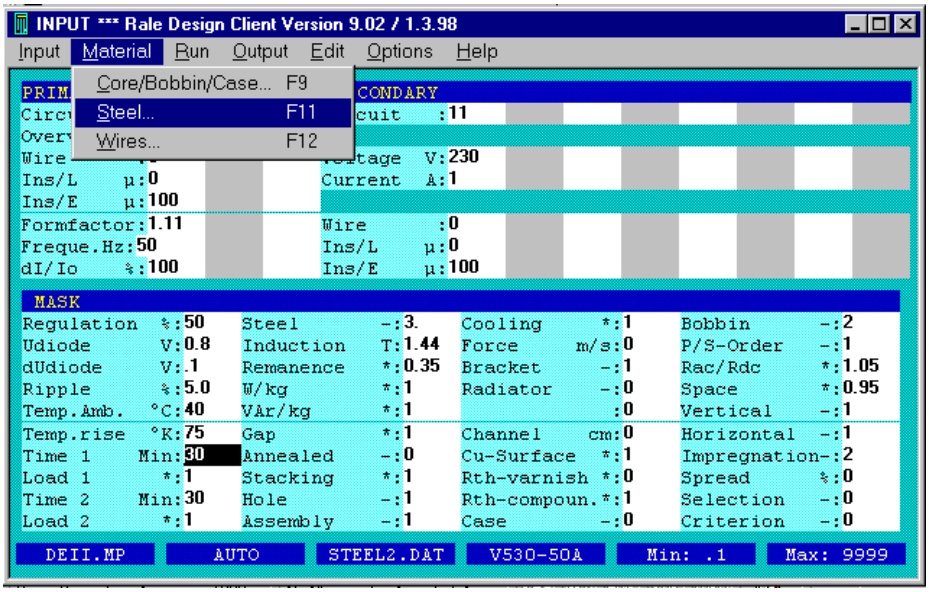
The input fields which are marked ***** are values with a unit of quantity (V, A, Hz,...) or multiplication factors. The input fields with - are code values. These can be entered or selected via the **Options**

(ESC=>Exit)

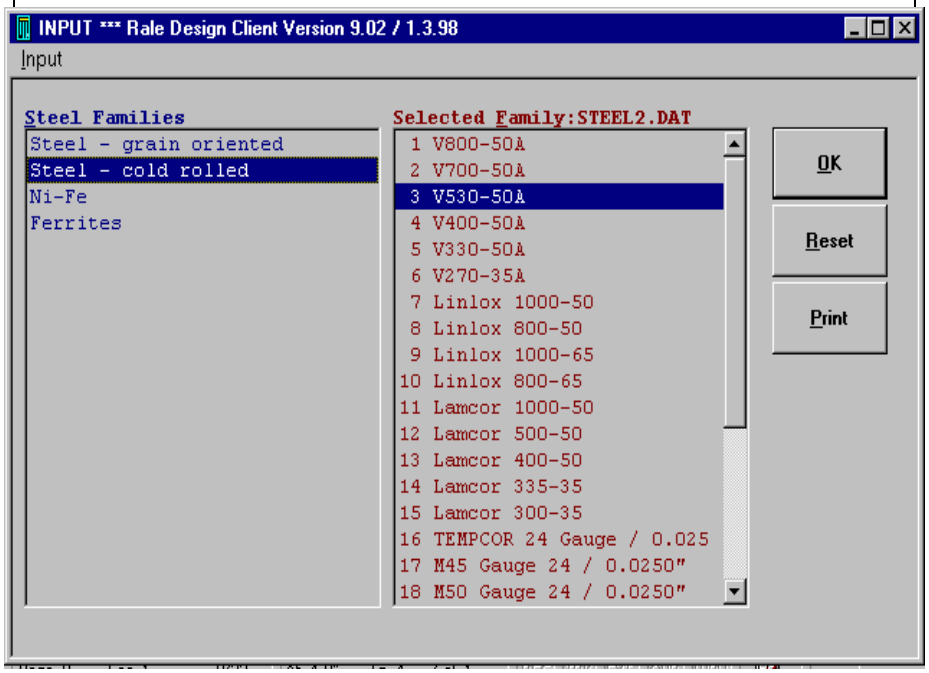


Wires and steel

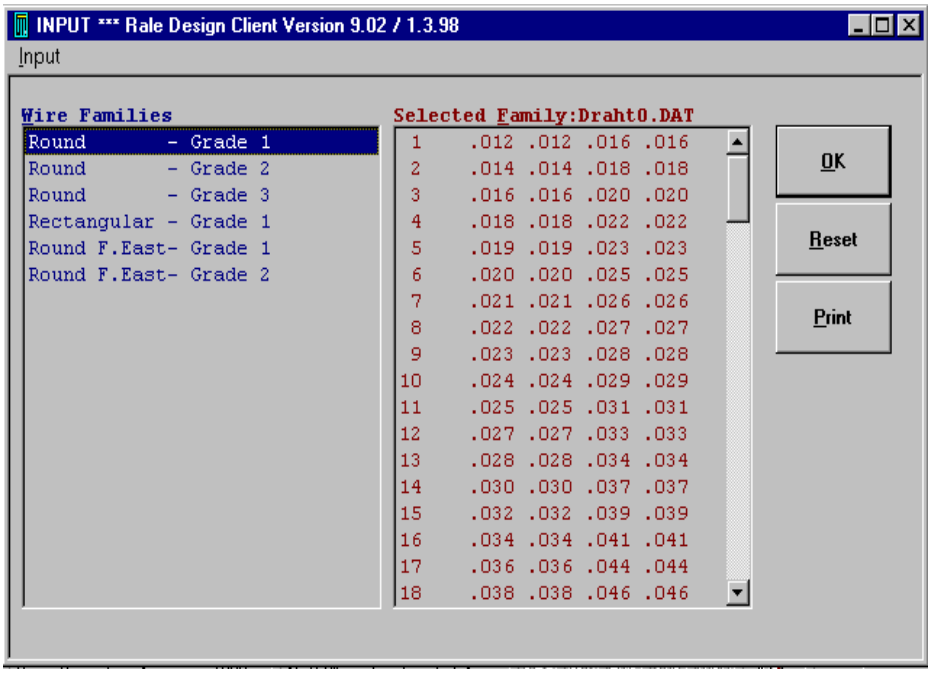
The input fields for **Wire** type (not wire size) and **Steel** are a minor exception in this instance and can be selected in addition to manual input via the **Material/Wires/Fe** menu or selected by means of keys **F11**and **F12**.



(Alt-M and F or F11only =>Fe-Quality), (Alt-M and W or F12 only =>Wires)



(TAB=>Move), (Click=>Mark), (Double click=>Select)



(TAB=>Move), (Click=>Mark), (Double click=>Select

Core and bobbin unit

Using the menu option of **Material/Cores** or key **F9**, you can select a core with a given bobbin or set up your own preferred combination.

The distinction is drawn between **4** different approaches for selection of the core and of the bobbin:

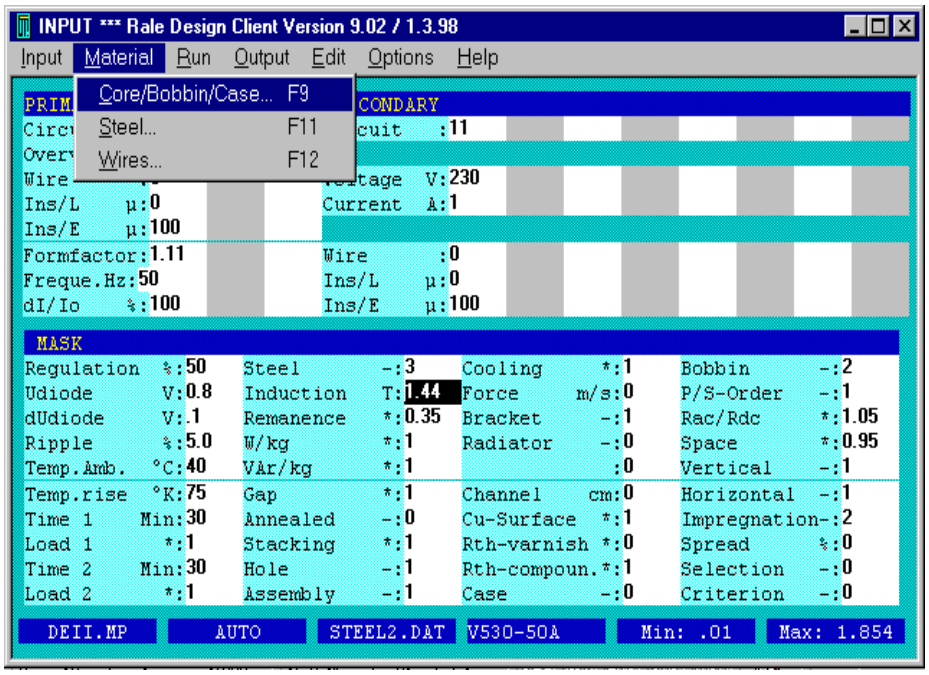
Automatic selection
(Selection = 0)

In this mode, you just know the core family for the core and the bobbin from which you have to choose. But you don't know which core is suitable for your application.

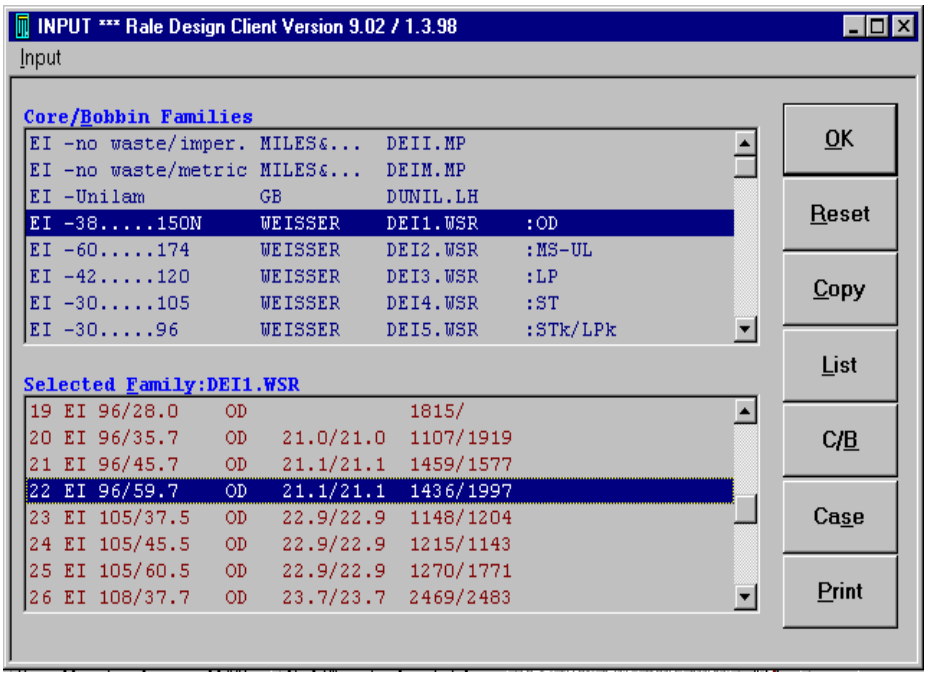
*Enter a **0** in the **Selection** input field.*
*The core name in the status line must be **AUTO**.*

Core and bobbins are selected
(Selection = 1)

You wish to produce your application with a given core and a given bobbin from a given core family.



(Alt-M and C or just F9 =>Cores and Bobbins)

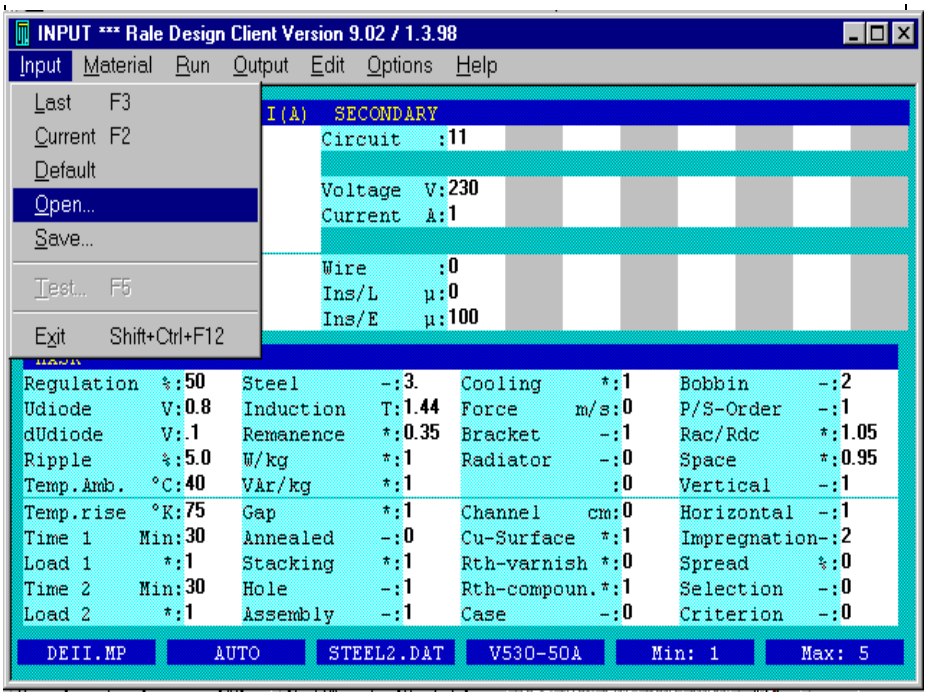


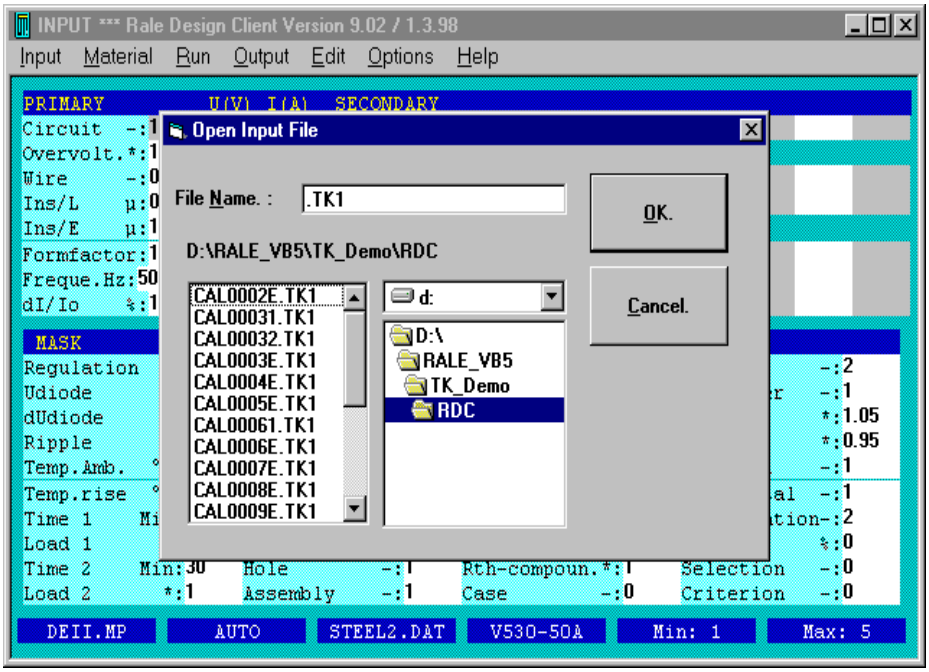
(TAB=>Move), (Click=>Mar), (Double click=>Select)

*Select the **Material/Cores** menu option or press key **F9.***
Select a core family.
Use the mouse to click on the core you prefer.
*Click on the OK button. The **Selection** input field has automatically acquired the value of **1**.*

Core and bobbin are incorporated from a single input data file (Selection = 2)

We have already selected an input data file before accessing the input mask, or we have loaded an input data file from the input mask via the **Input/Open** menu option. In this instance, we incorporated the core and bobbin stored in this input data file. The input field for **Selection** has a value of **2**. Using this procedure, we have no further work to do with regard to core selection **on-line**.

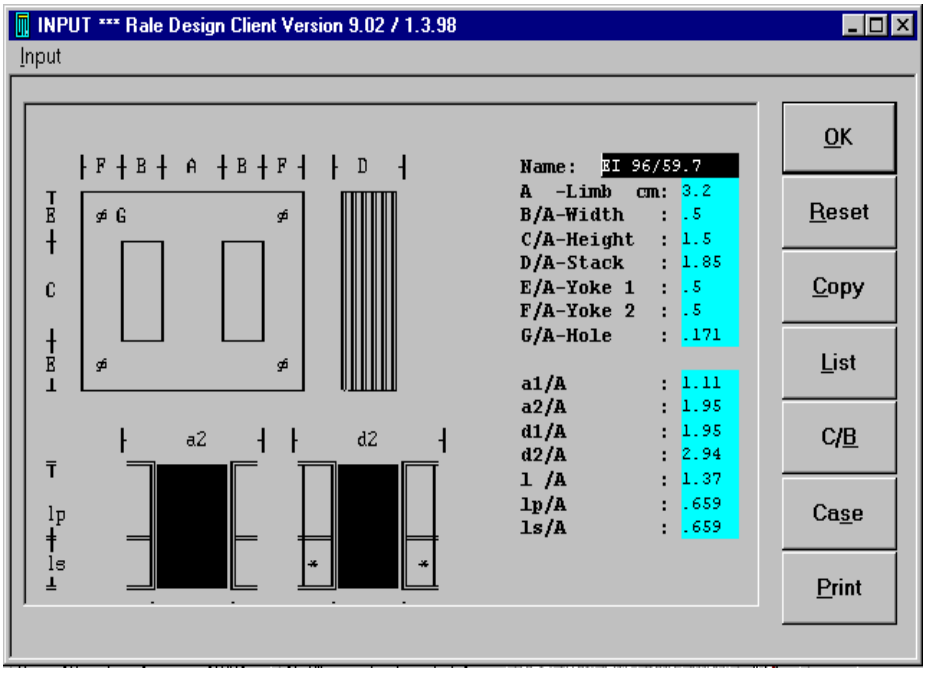


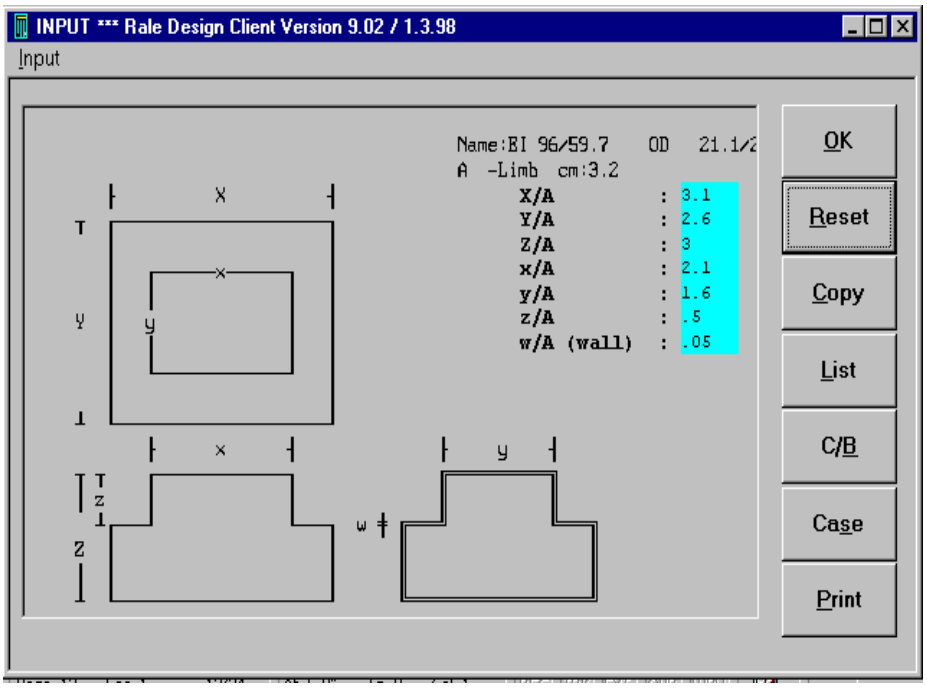


(TAB=>Move), (Click=>Mark), (Double click=>Select)

The core and bobbin are manually entered
(Selection = 3)

You wish to achieve your application with a given core and a given bobbin, but the core does not exist in any core family.





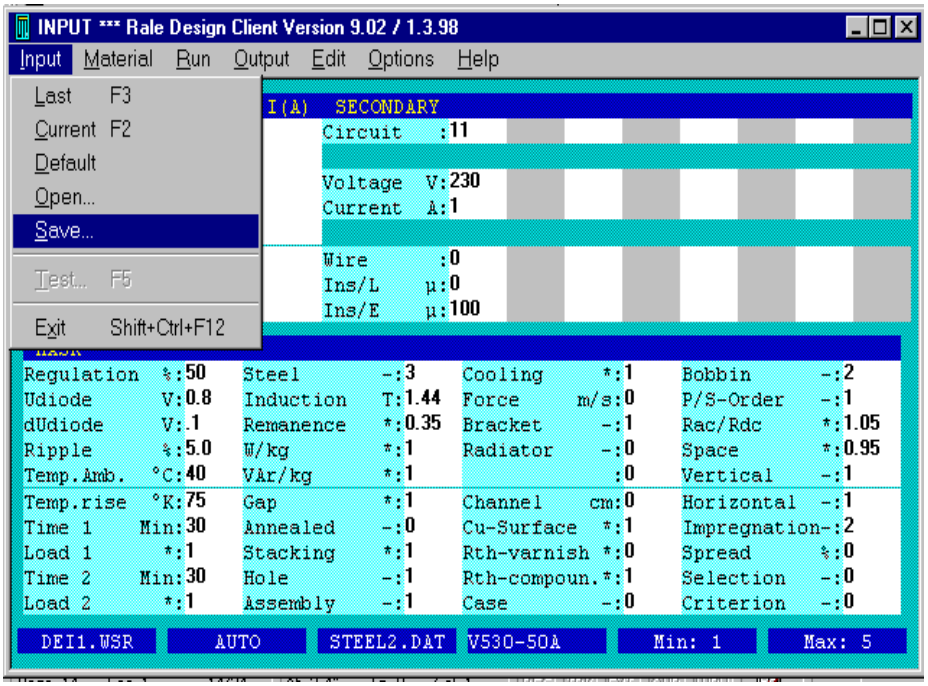
(Numerical=>Input), (TAB, Mouse=>Move)

*Select the **Material/Cores** menu option or press key **F9.***
Select a core family which could include your core.
Use the mouse to click on a core which is similar to yours.
*Use the mouse to click on the **Copy** button and then **Yes**.*
Change the core, the bobbiand/orthe case.
*Click on the **OK** button. The **Selection** input field has automatically acquired the value of **3.***

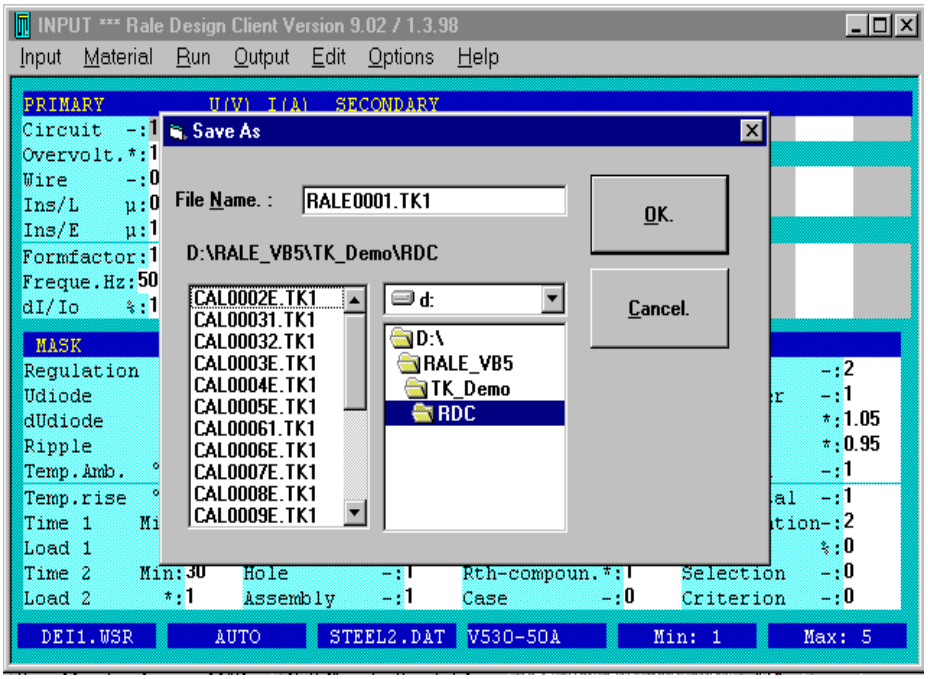
Under this procedure, we have no further work to do **on-line** with regard to core selection.

Saving the input data file

Your input is **COMPLETE!** It is recommended that you save your input data into an input file.



(Alt-I and S)



(TAB => Move), (Click => Mark), (Double click => Select)

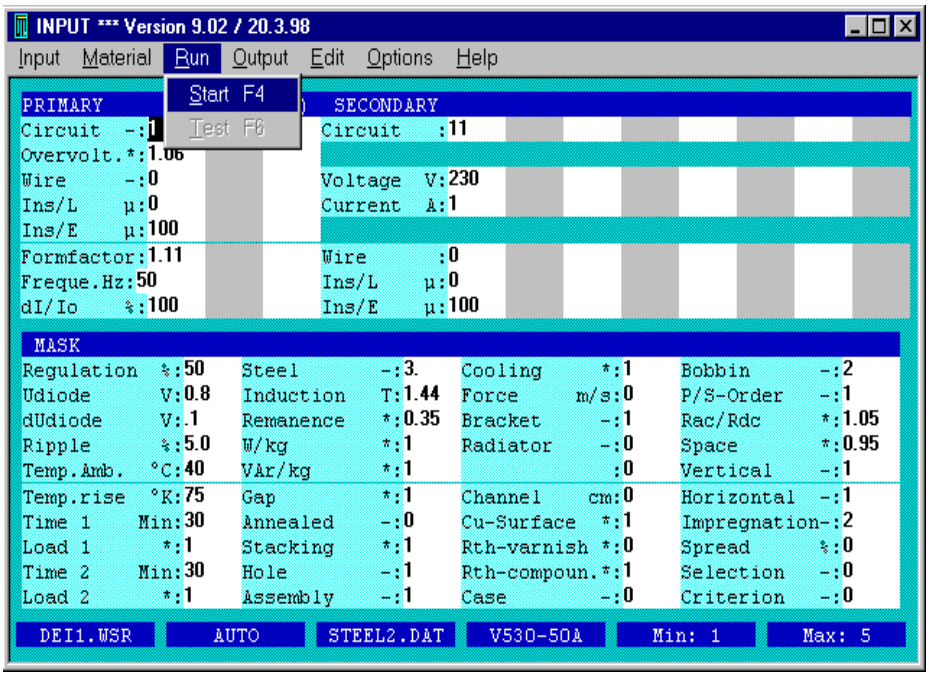
*Select the **Input/Save** menu option*

*Enter the name of your input data file (max.of **8** characters, and the extension **.TK1** cannot be modified).*

*Click on the **OK** button.*

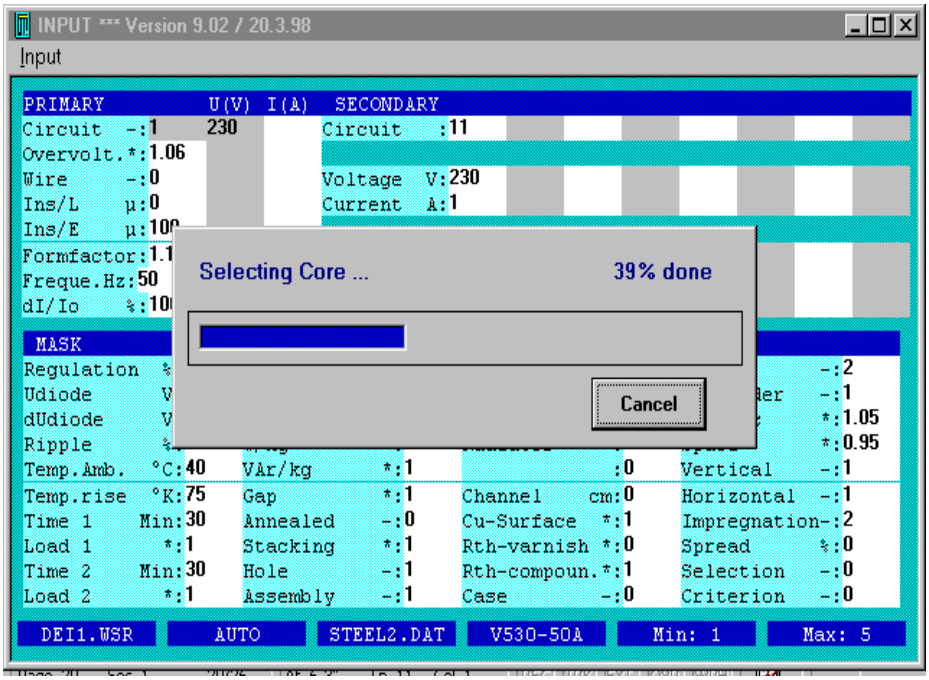
Run designing

Design is started via the **Run/Start** menu option or with key **F4**.

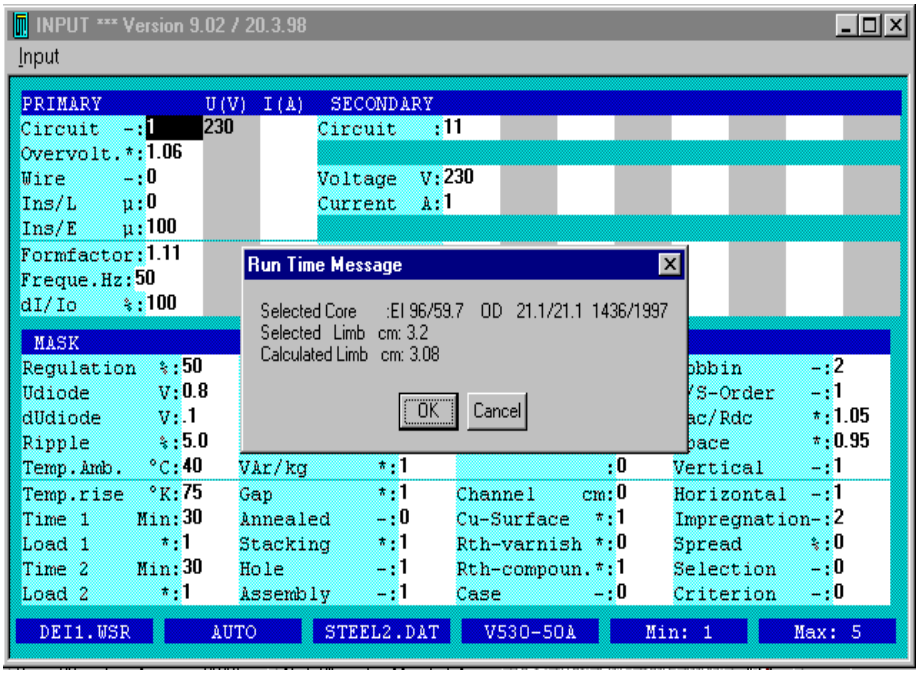


(Alt-R and S or just F4)

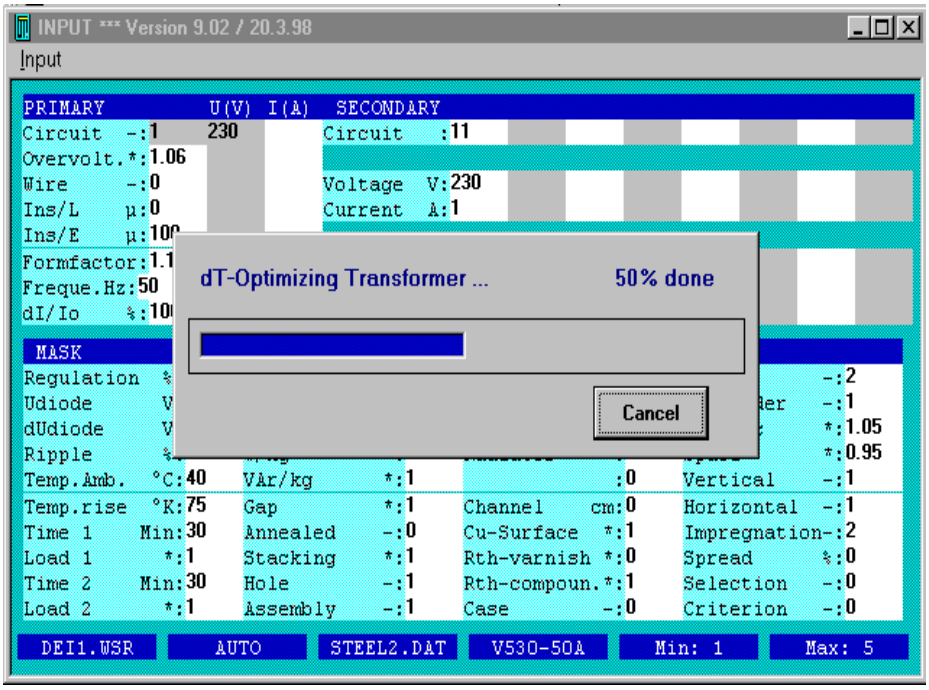
If you have not already selected a core, the program starts automatic search in accordance with one of your requirements from the core size as per your inputting, from the selected core data file.



The program starts searching at the first core of the core family and passes through to the last core in the family in sequence. You are invited to approve the first core which is adequately large for your application.

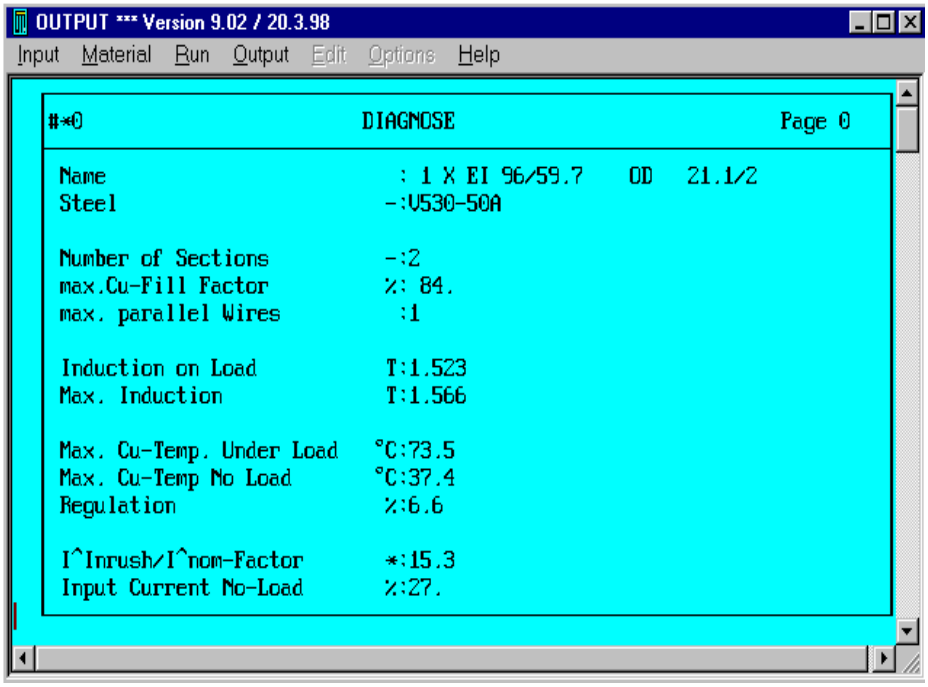


This is followed by the design operation. Note that there are 2 criteria of the optimizing: dT => temperature rise or dU => Regulation



Data page for winding

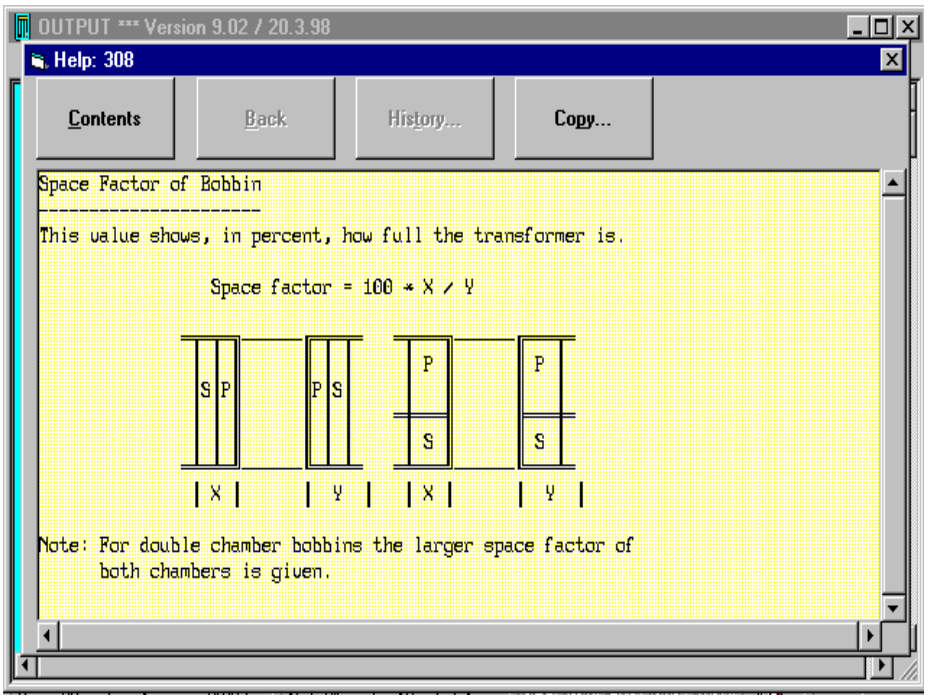
After the design procedure, a summary of the main results will appear on-screen.



(Mouse, control bar, Arrows, PgUp, PgDn=>Move)

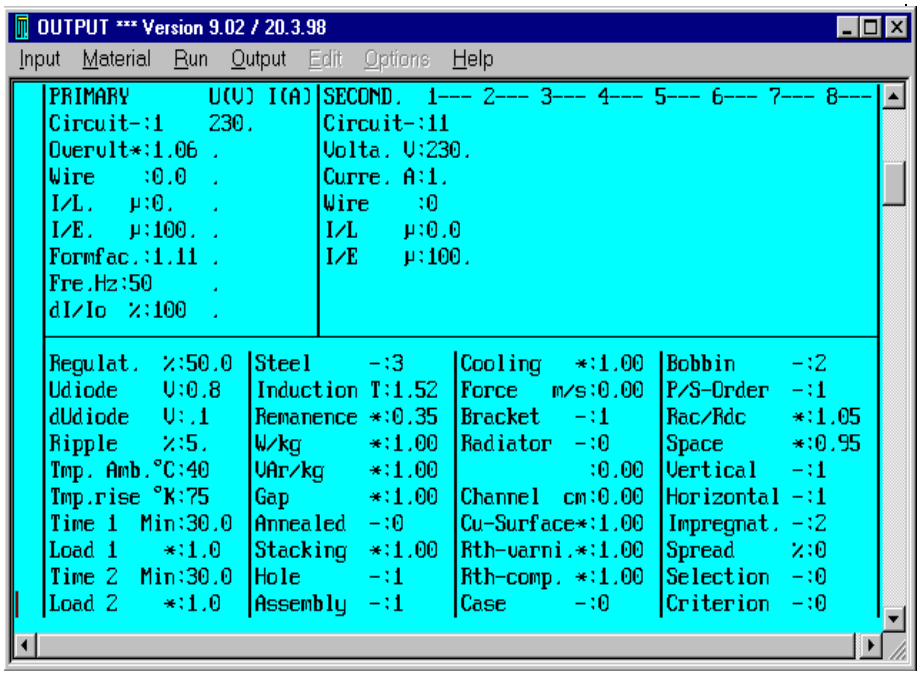
The continuation of the above screen illustrates the extensive display of the design results. Each designed value is allocated with an appropriate explanatory text.

*If you should need further information, please locate the cursor on the size value and press key **F1**. This activates on-line help.*

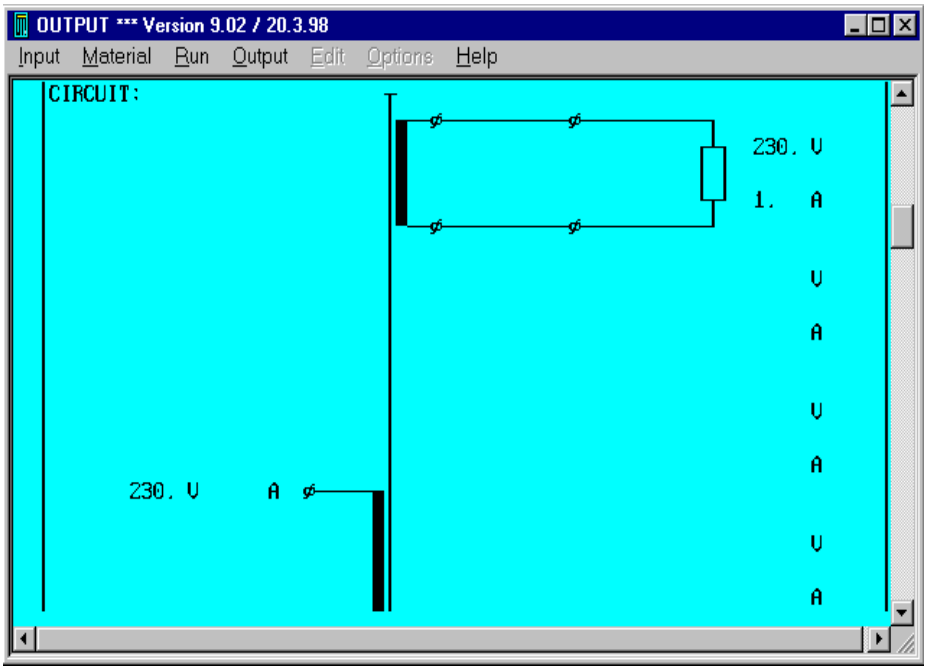


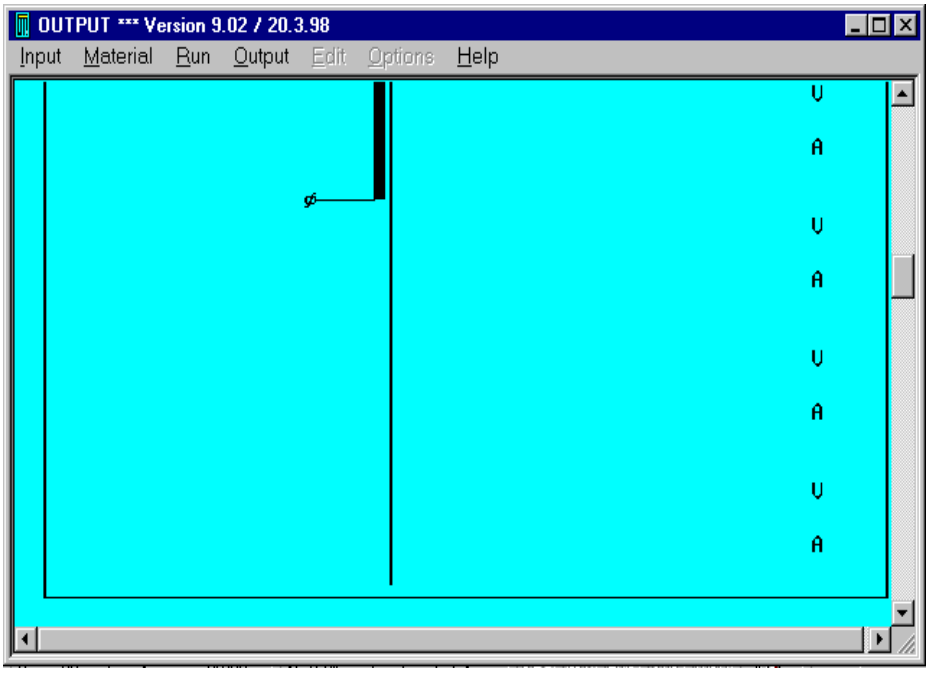
(Mouse, PgDn, PgUp, Arrows=>Move), (ESC=>Exit)

Press Key "2" to jump to this screen



Press Key "3" to jamp to this screen





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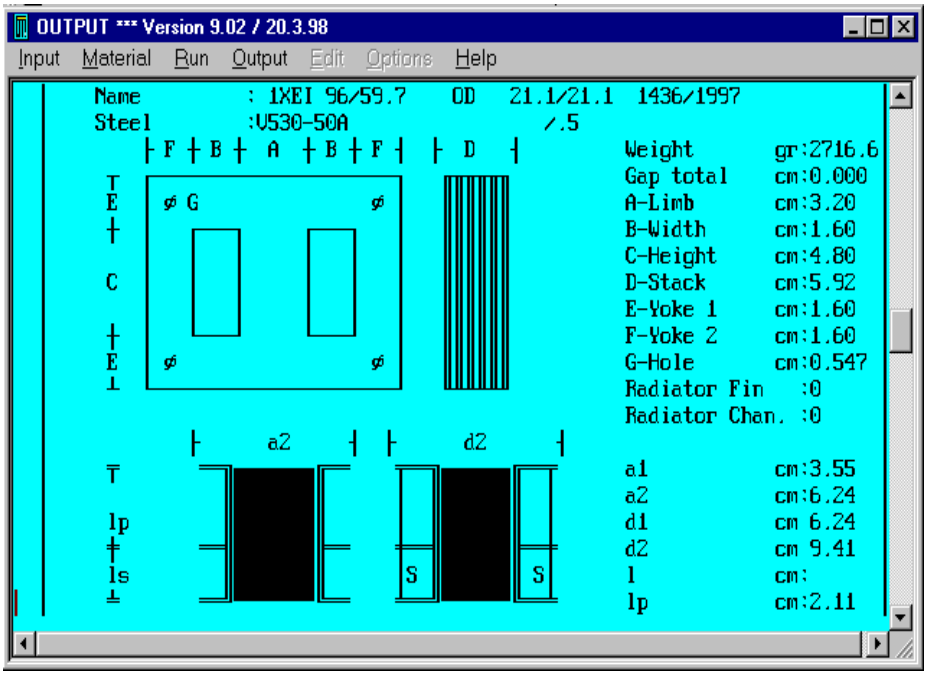
Press key "4" to jump to this screen



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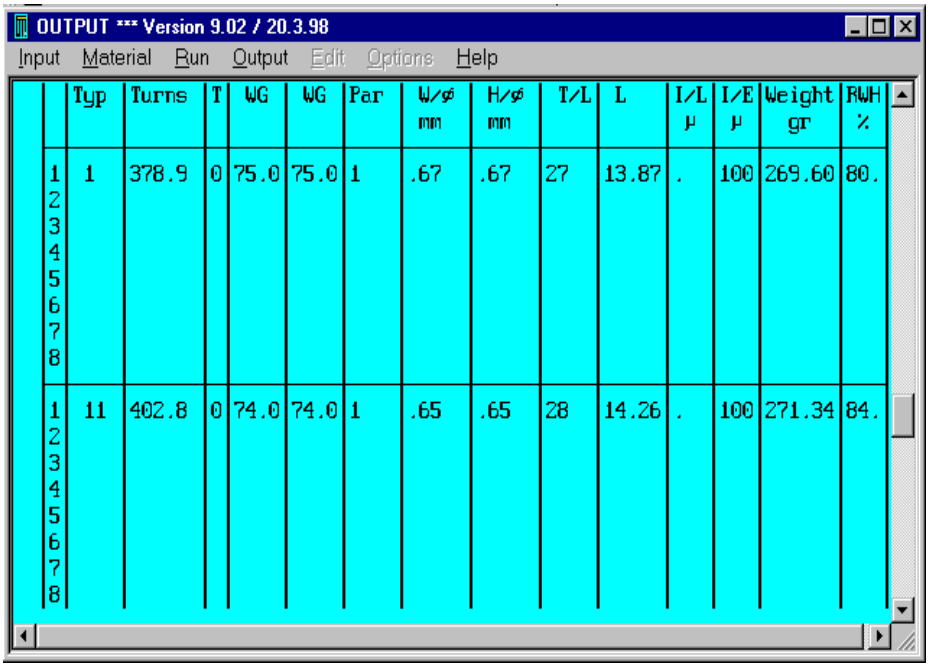
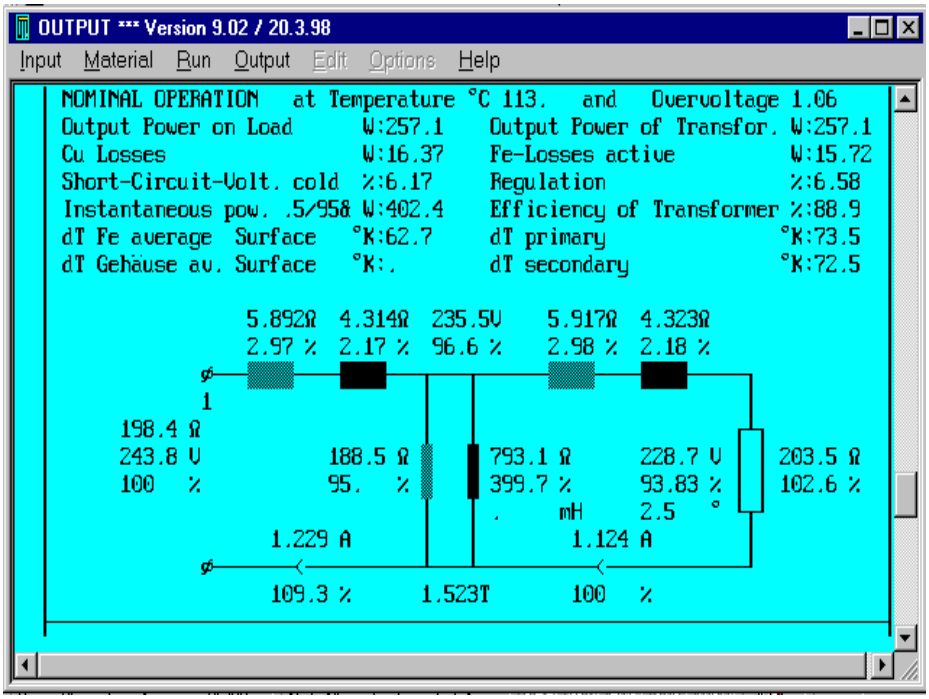
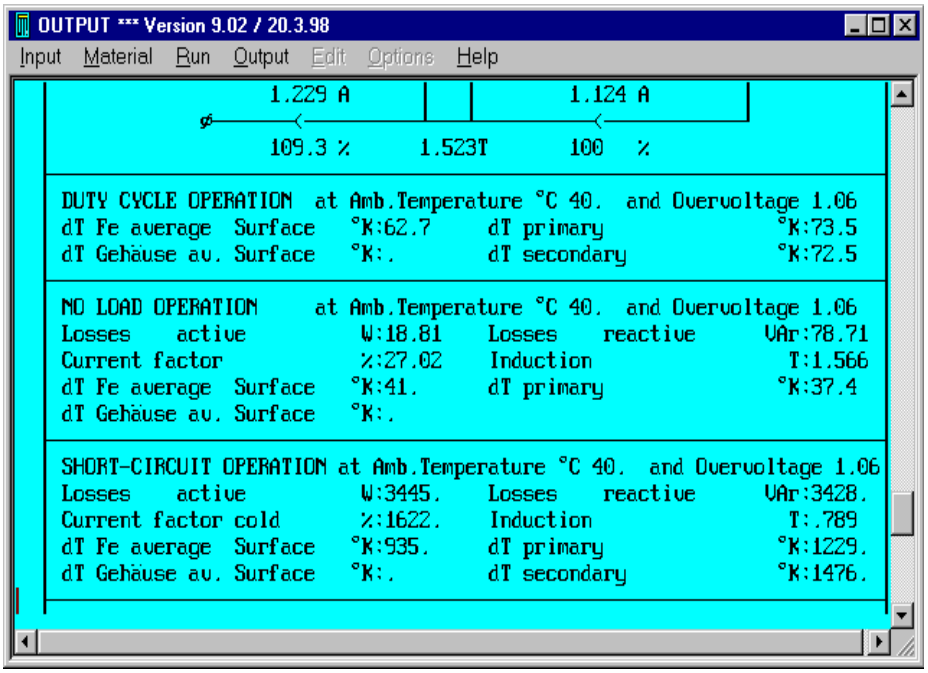
Press key "5" to jump to this screen



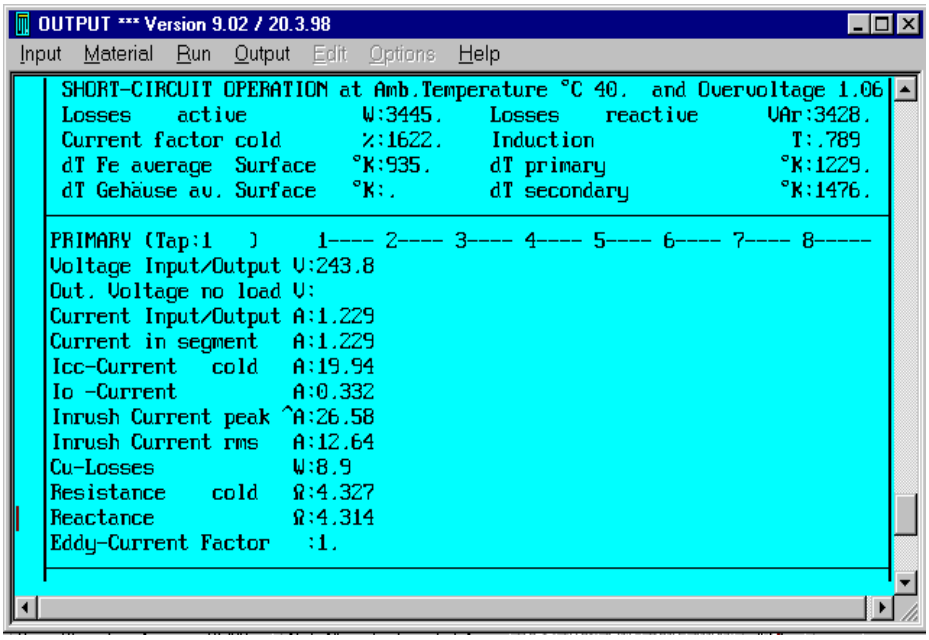
Press key "6" to jump to this screen.



Press key "7" to jump to this screen.



Press key "8" to jump to this screen.



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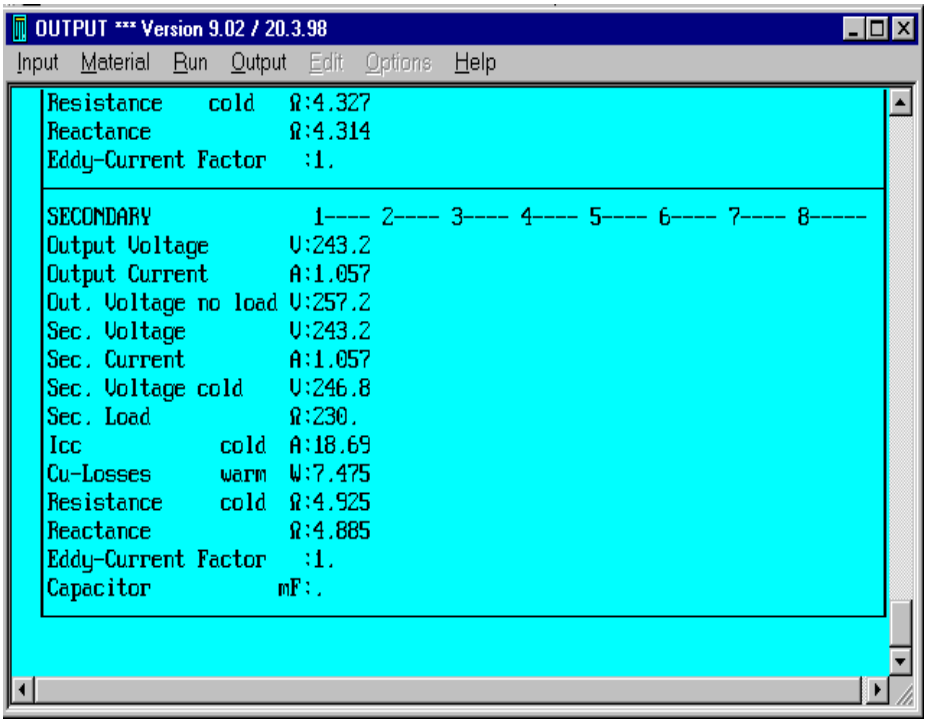
Press key "9" to jump to this screen



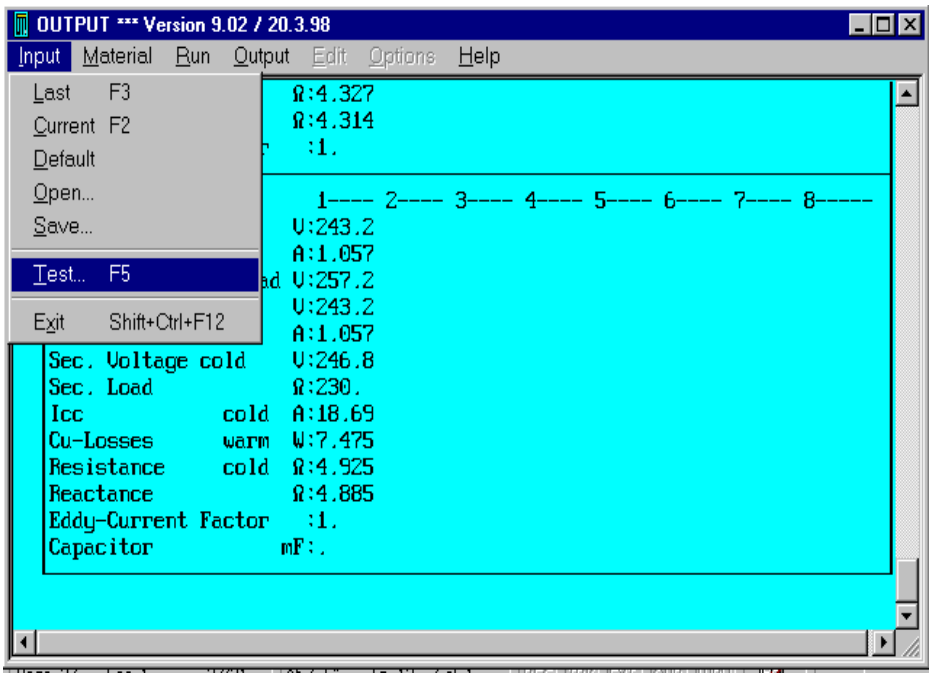
If you are not satisfied with the results of design, you can :

Return to the input form via the **Input/Current** menu option or by means of key **F2,** and reconfigure the input data on-line

Or pass to the test mode via the **Input/Test** menu option or with key **F5**.

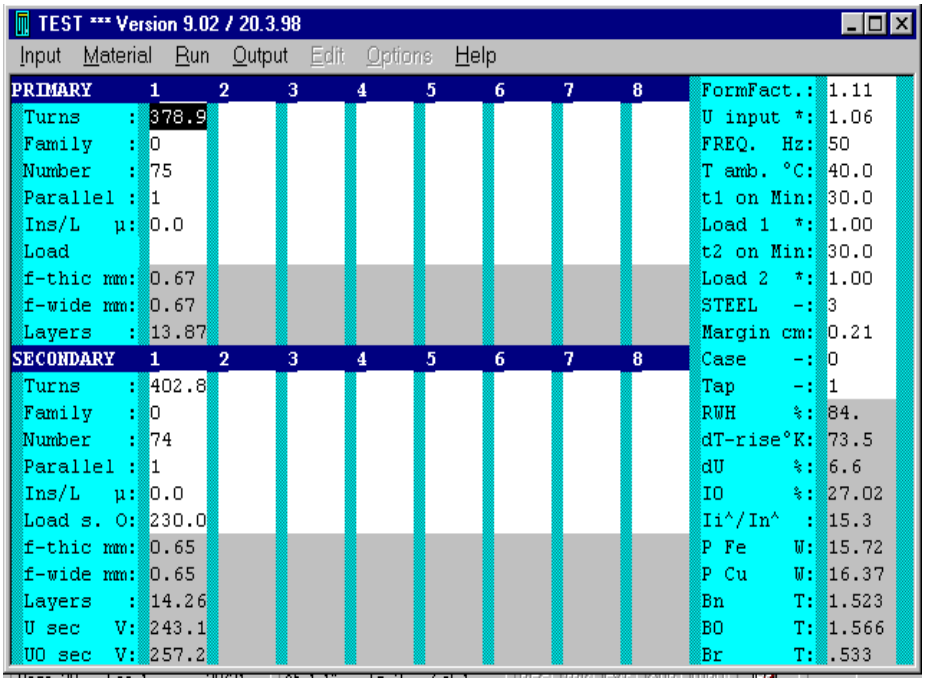
*Activate the **Input/Test** menu option or press key **F5***

Test mode



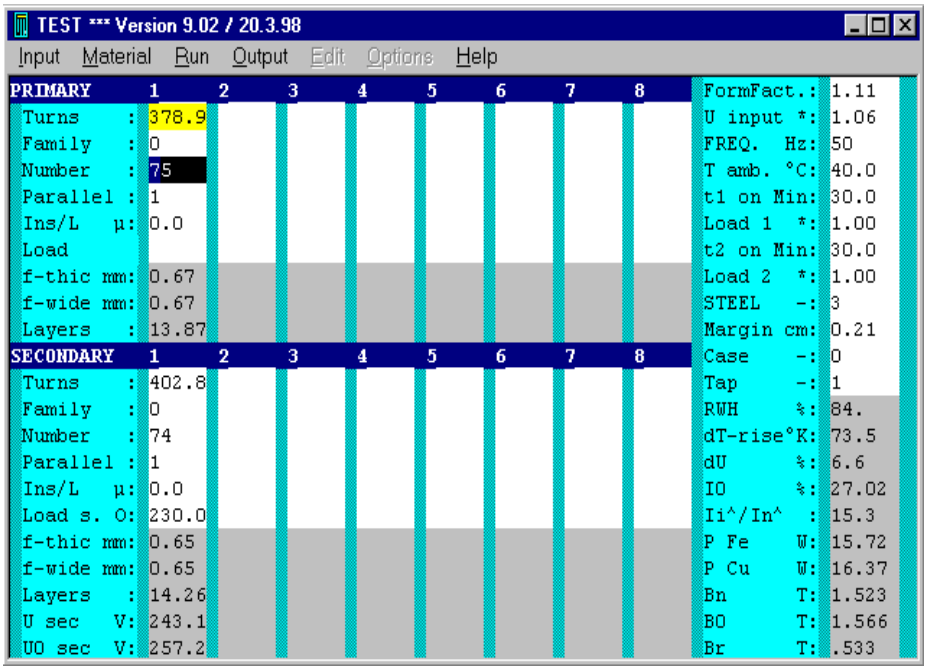
(Alt-I and T or F5 only)

In the test mode you can test a designed transformer and manually change its parameters.

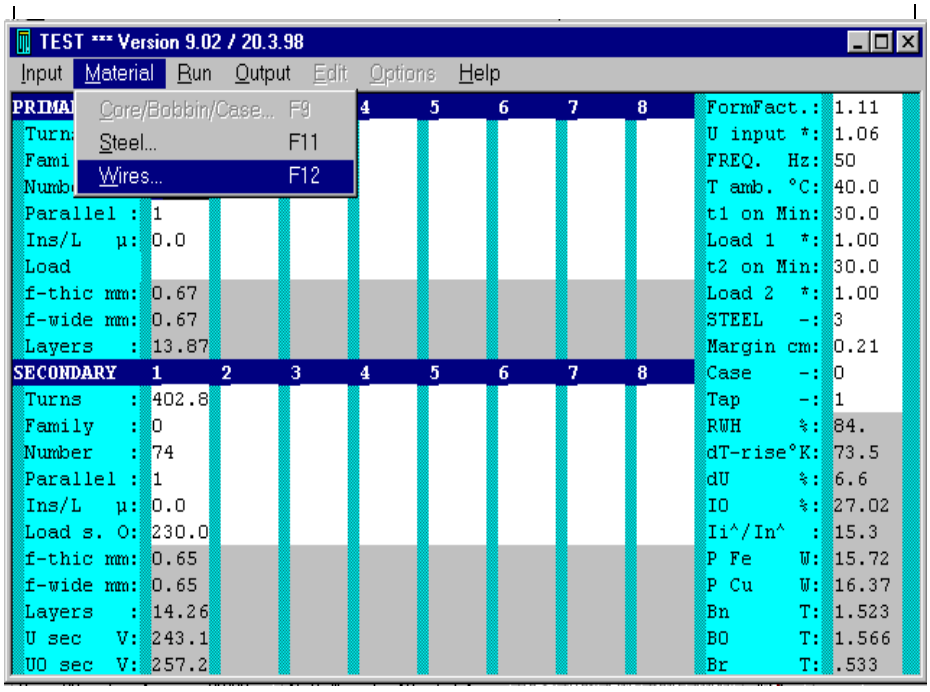


(Numerical =>Input), (TAB, Arrows, PgUp, PgDn, Mouse=>Moved)

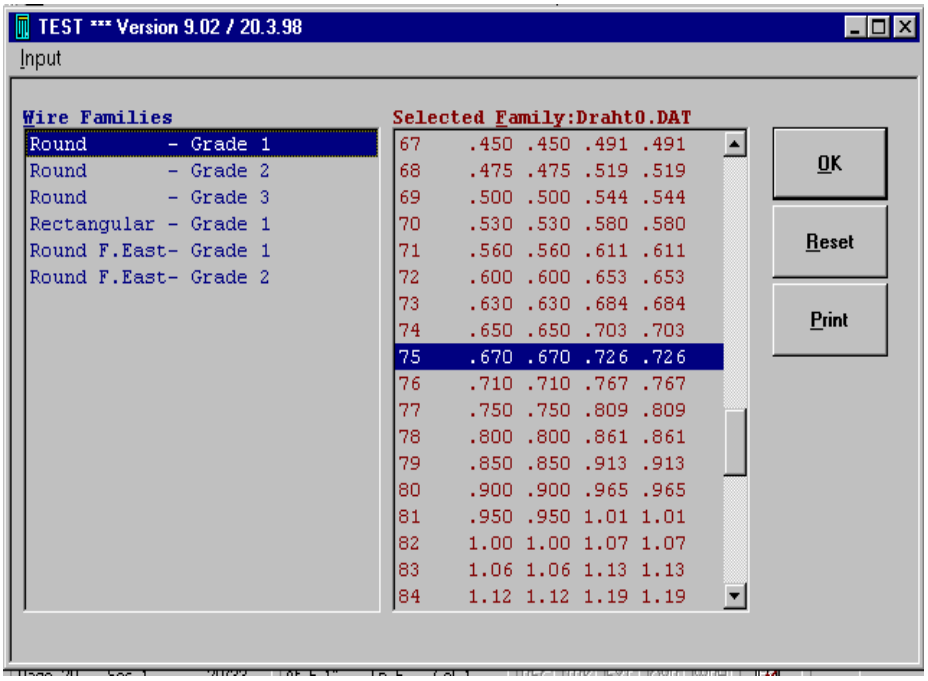
The input fields with the white background can be modified. For instance, if you want to change the wire size you have to move the cursor to the wire number:



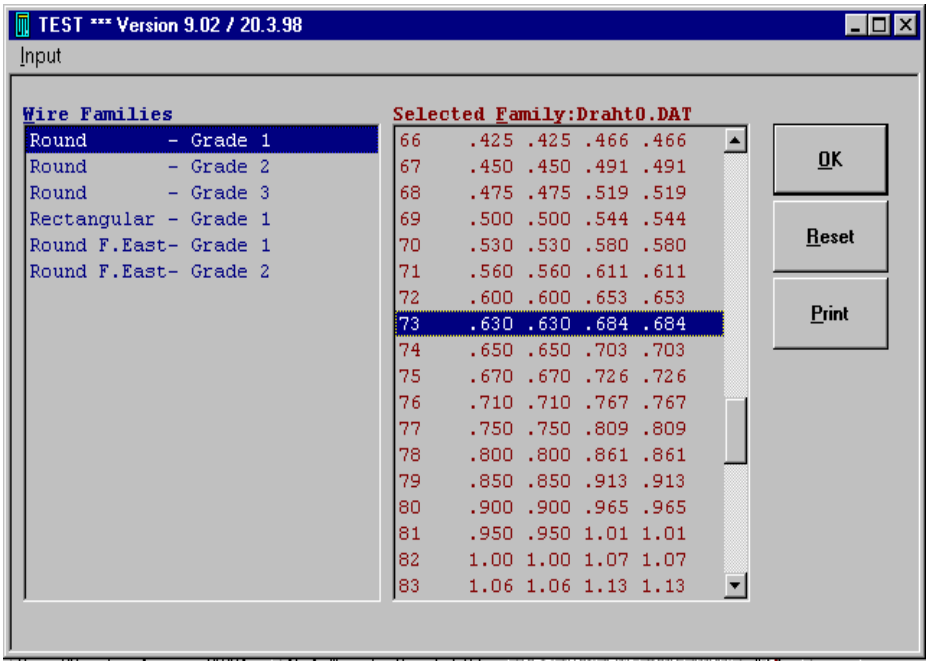
Click the menu option Material/Wires or press F12 to open the list with the wires.



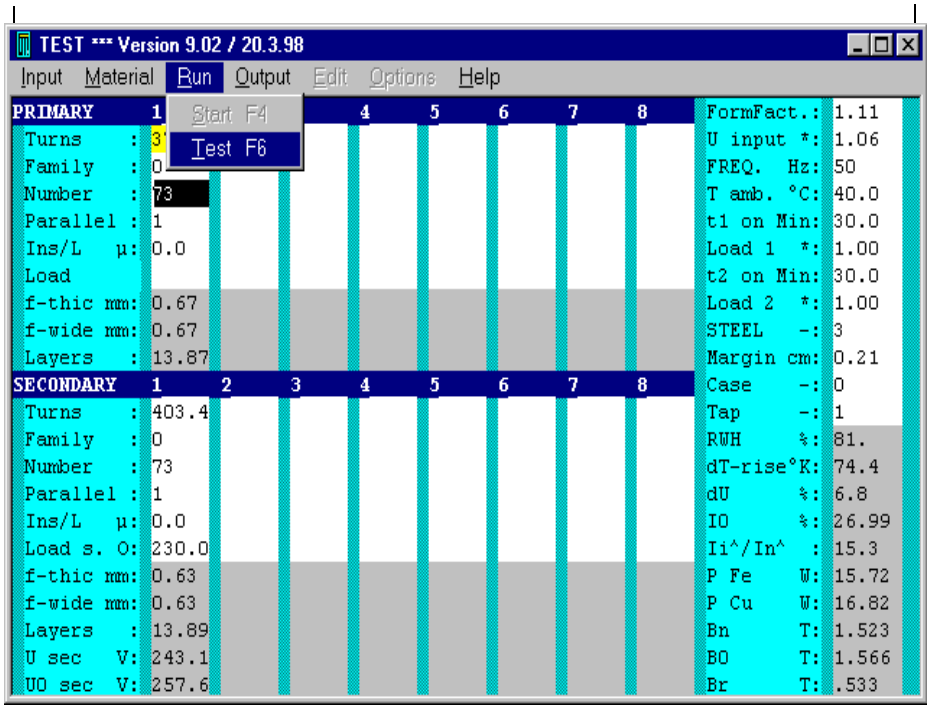
This the current wire size



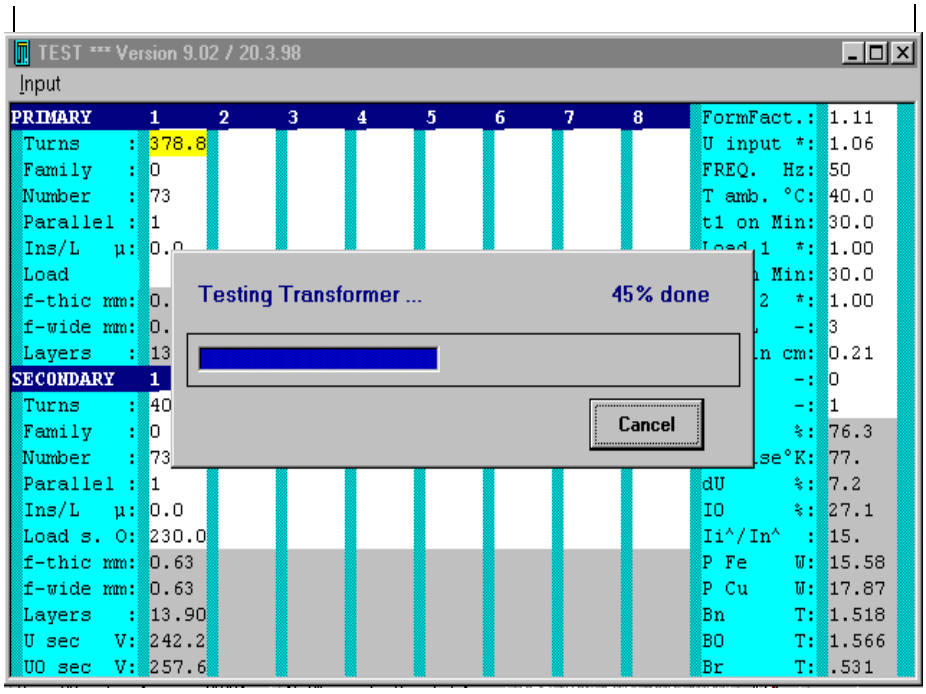
Select the wire size which you want and pres **Alt-O** or click **OK**



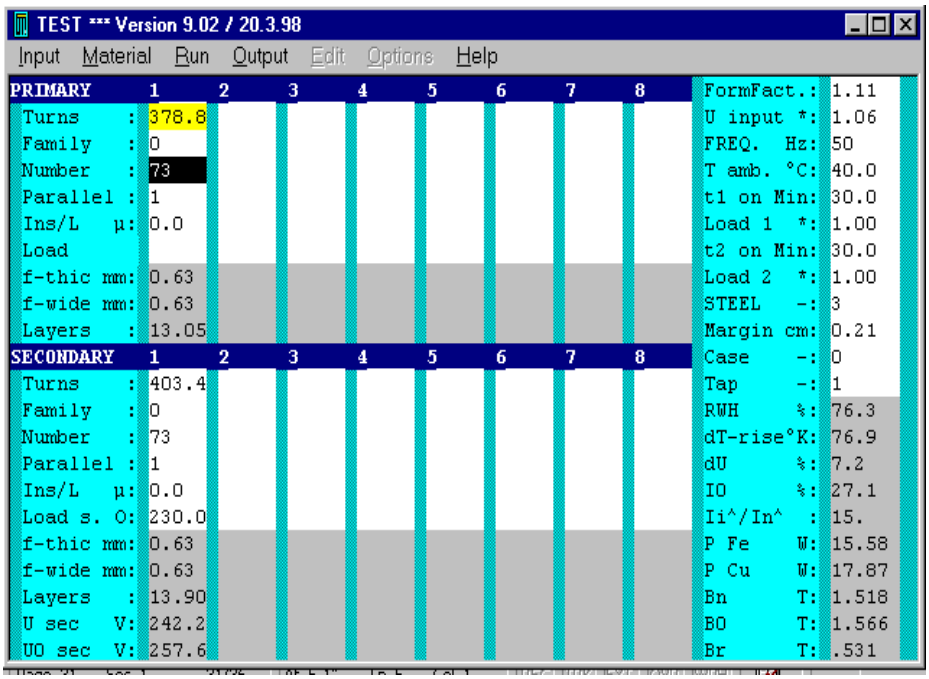
Re-design in the test mode is activated via the **Run/Test** menu option or by means of key **F6**.



(Alt-R and Tor F6 only)



Here is the result after the re-design.



Help in test mode

In order to get on-line help in the test mode place the cursor where you need help and press **F1**

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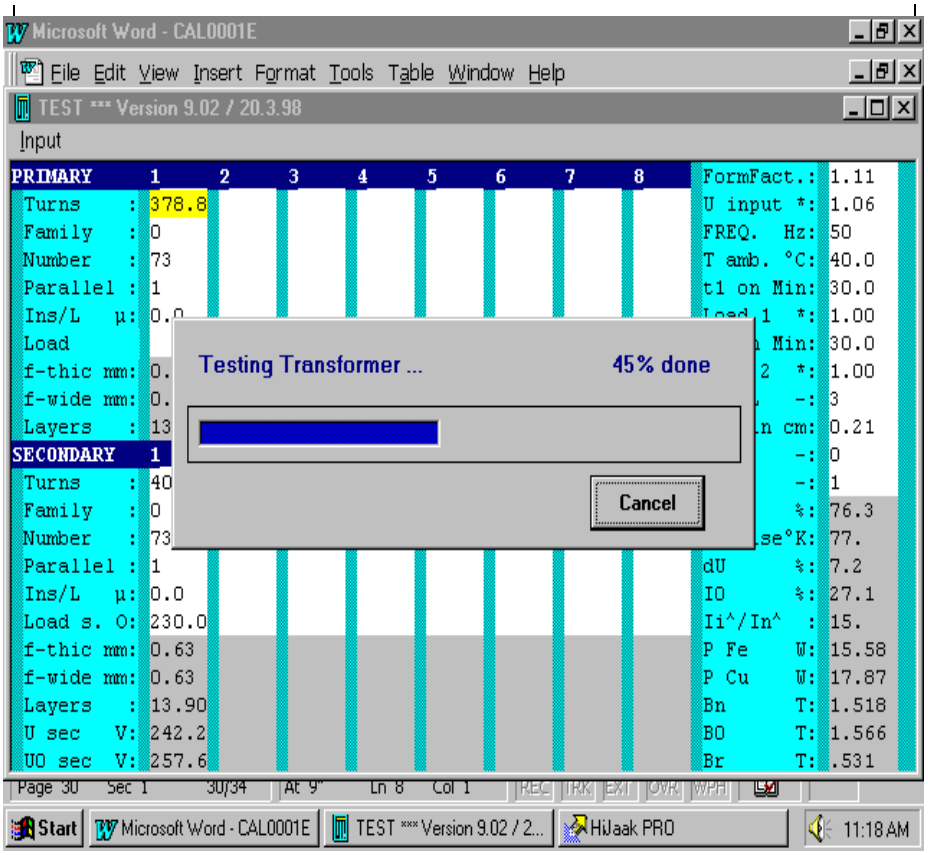
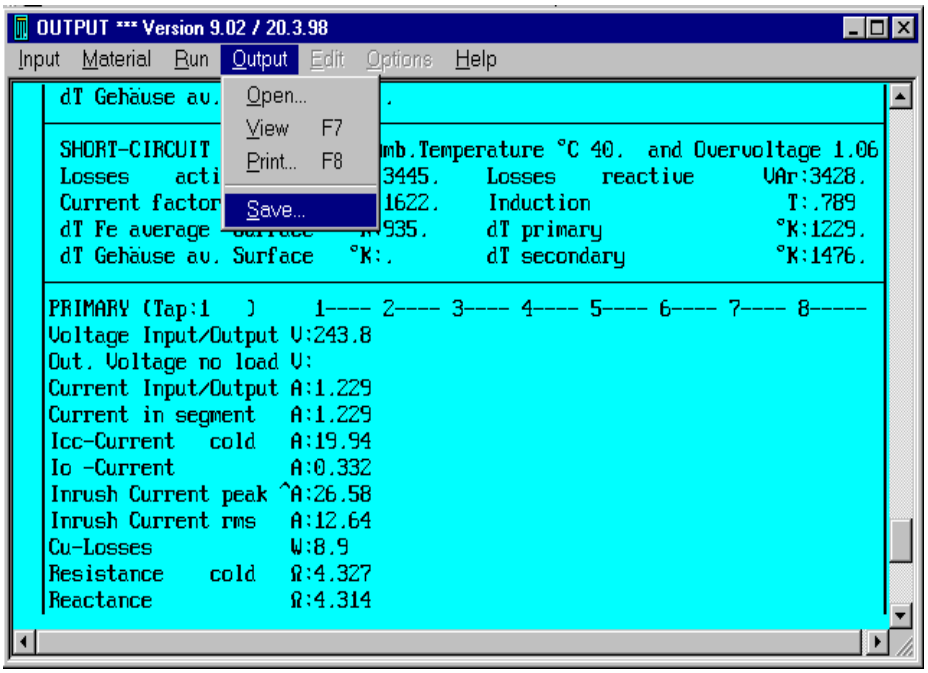


Printing

The printing is performed via the **Output/Print** menu option or by means of key **F8**. After activation of the print process, the data, totalling approx 16kB (3 pages), is printed on your printer. You can too save the results of design on your PC and load them and print out later. The procedure for saving of the designed data looks like this:

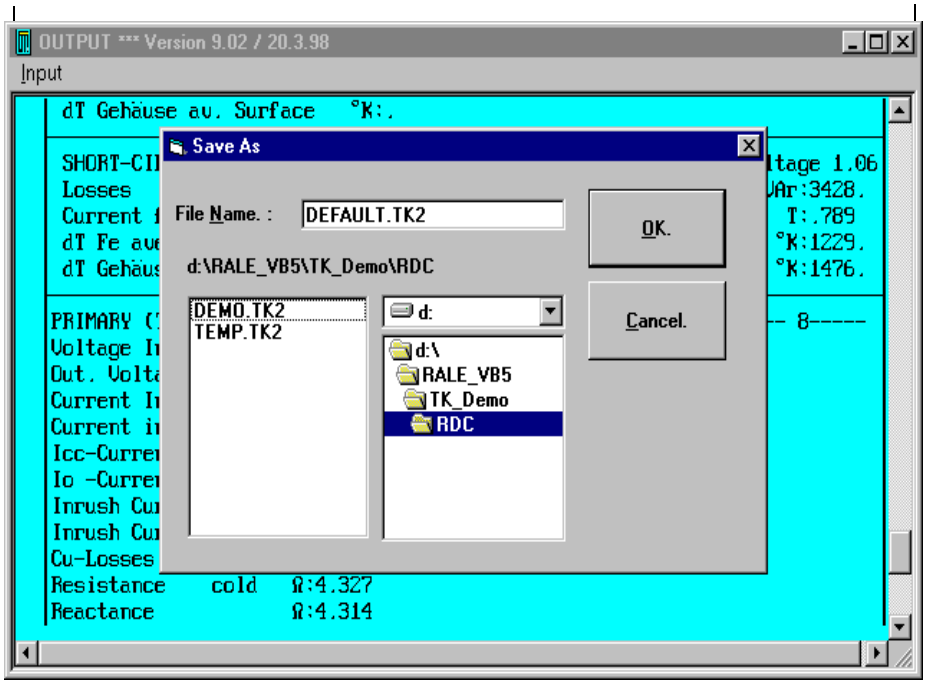
Saving of results of design

Saving of the designed data which you can load and print out **later** on the data page for the winding**,** is activated via the **Output/Save** menu option.



(Alt-A and S)

Enter a name for the output file in which the designed data is to be saved.



(TAB=>Move), (Click=>Mark), (Double click=>Select)

This completes your design.

Quitting your RALE Design System for small transformers

*Select the **Input/exit** menu option or press key **CrtI-F12** and then click on the **Yes** button.*

Important note:

In this context, we have just discussed the procedure for design of the small transformer. There is extensive coverage of the technical aspect of design, within the design examples.