ProDelphi User Guide

(Release 8.0)

The Profiler for Delphi 2, 3, 4 and 5 (for Pentium and compatible CPU's)

Profiling

The purpose of ProDelphi is to find out which parts of a program consume the most CPU-time. Because Borland (Inprise, Corel or however) gave up the profiler for 32-bit applications, a new tool had to be created. ProDelphi with it's comfortable viewer, browser, history and programmers API meanwhile is more than the legendary Tubo Profiler. The viewer with it's sorted results enables the user to find the bottle necks of his program very fast. The history function shows the user, if a preceeding optimization was successful or not. ProDelphi's outstanding granularity makes it possible even to optimize time critical procedures. The built-in calibration routine adapts the measurement routines to the used processor and guaranties results that do not include measurement overhead.

Starting with release 7.4 even a simple coverage profiling can be performed. All methods that are not called while profiling are stored at the end of the testees run an can displayed by the built-in browser. If a coverage profiling on a line-by-line base is necessary, the coverage tool Discover can be strongly recommended (see links on the ProDelphi web page).

Starting with release 8.0 the dynamic acitivation becomes very easy to use. Instead of inserting API-Calls (which in all former releases was possible and still is), now by a handy dialog the activation starting methods can be selected. The in all former version built-in functionality of the measurement-DLL is without recompilation usable now for switchin between different activation procedures.

Also starting with release 8.0 measurement on another PC can be emulated. Instead of installing the complete IDE on a faster or slower PC now you can measure under your normal equipment and let ProDelphi recalculate the measurement results for any given PC.

Post Mortem Review

Another reason to develop ProDelphi was the need for a tool that shows the call stack of a testee in case of an abortion / exception. ProDelphi realizes that function without the testee running under the IDE.

Differences between the freeware version and the professional version

The freeware version can measure or track until 30 procedures, the professional version can measure 32000 procedures.

The professional version can additionally measure and track assembler procedures.

Date: 05/02/2000

0. Contents of this description

BEFORE using ProDelphi practically, please read Chapter 15 carefully !!!

A. Principle of Profiling

The source code of the program to be optimized is vaccinated with calls to a time measuring unit. The insertions are made at the begin and the end of a procedure or function.

Any time a procedure / function / method (in the following named procedure) is called, the start time of the procedure is memorized. At the end of the procedure the ellapsed time is calculated. **When the program ends**, between three and five files are created that content the runtimes for each procedure:

The **first** file (prgramname.TXT) contents the elapsed times in CPU-Cycles. The format is ASCII, separated by semicolon (;) and can be used either for **Data Base import** or for the **built-in viewer of ProDelphi**. The format is described at the end of this description.

The **second** file (programname.TX2) contents additional information like headline and how often measurements have been appended to the first file. It is relevant in connection with the online operation window or the programmers API.

The **third** file (programname.NEV) contents the names of all methods which have never been called when measuring the runtime of your program. It is used be the viewer, it is displayed as a hierarchical tree when you press the button named 'Not called methods'. This button is not enabled if all methods have been called or if you display the measurement results of a former version of ProDelphi.

The **fourth** file is optional and contents the measurement results in a format, that can be printed in landscape format or can be viewed by Delphi. It is described in chapter A1.3.

The **fifth** file is also optional and only created, if the automatic switching off is activated (see A5).

A1 How to profile

Using ProDelphi is quite simple. It has been used in a project with a large program, it contained more than 280 000 lines of code written by 12 programmers. After more than two years of developping the program has been optimized with the help of ProDelphi. The programs runtime could be decreased by 50 %.

Use the Setup-program to install ProDelphi. If you want to install ProDelphi manually, you need to perform the following steps:

Copy the files ProfCali.DLL and ProfMeas.DLL into the WINDOWS\SYSTEM - directory (for Windows 95/98) or into the WINDOWS\SYSTEM32 - directory (for Windows NT). Copy the files ProfInt.PAS, ProfOnli.PAS, ProfOnli.DFM into into the Delphi LIB-directory. The DFM-files are distributed as DF2-, DF3-, DF4- and DF5- files for Delphi 2/3/4/5. You need to rename the correct file.

After installation, try to compile your program to create the Delphi project files (the DOF-file is needed bey ProDelphi). **If no DOF-file exists, all files have to be in the same directory (*.PAS, *.INC, *.DPR, *.EXE and **.DLL*).**

If you want to measure procedures in a DLL, compile the DLL.

If you want to measure procedures in the program and in DLL's simultaneously, program and DLL's must have exactly the same units source path and the DPR-files must be in the same directory, in that case compile both program and DLL's.

If no compilation errors occur, you may profile your program (*and/or DLL*).

Don't use the original units for profiling, maybe ProDelphi still contents bugs. Just make a security copy of the program to be measured, e.g. by zipping all PAS-, DPR and INC-files.

For profiling your sources perform the following steps:

- Define the Compiler-Symbol PROFILE.

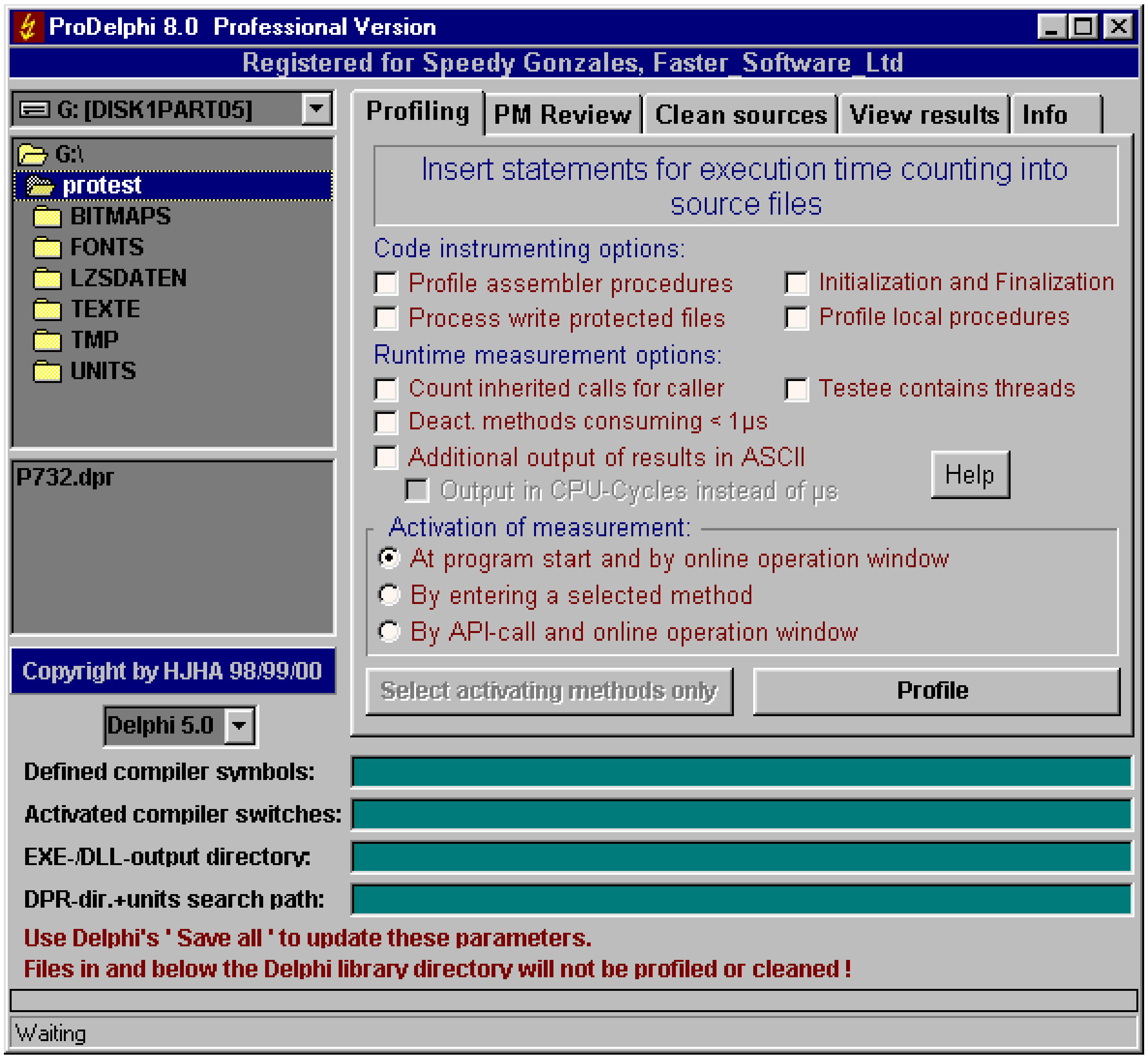
- Deactivate the Optimization option.

- Optionally deactivate all runtime checks.

- Use the Delphi 'Save All' command. This assures that the options file (*.DOF) is stored.

- Start ProDelphi from the Delphi tools menu, from the Windows Startmenu or somehow else.

See next page for the ProDelphi window, please.


ProDelphi 8.0 Professional Version

Registered for Speedy Gonzales, Faster_Software_Ltd

G: [DISK1PART05]

G:\
protest
BITMAPS
FONTS
LZSDATEN
TEXTE
TMP
UNITS

P732.dpr

Copyright by HJHA 98/99/00

Delphi 5.0

Profiling | PM Review | Clean sources | View results | Info

Insert statements for execution time counting into source files

Code instrumenting options:

- [ ] Profile assembler procedures
- [ ] Initialization and Finalization
- [ ] Process write protected files
- [ ] Profile local procedures

Runtime measurement options:

- [ ] Count inherited calls for caller
- [ ] Testee contains threads
- [ ] Deact. methods consuming < 1µs
- [ ] Additional output of results in ASCII
  - [ ] Output in CPU-Cycles instead of µs

Help

Activation of measurement:

- [✓ At program start and by online operation window]
- By entering a selected method
- By API-call and online operation window

Select activating methods only | Profile

Defined compiler symbols:

Activated compiler switches:

EXE-/DLL-output directory:

DPR-dir.+units search path:

Use Delphi's ' Save all ' to update these parameters.

Files in and below the Delphi library directory will not be profiled or cleaned !

Waiting

- In ProDelphi select 'Profile'.

- Select the directory wich contents the DPR- files.

- Select the program you want to profile.

- Click the Run-button. After a very short time all units are vaccinated. The vaccinated files are listed in a log window.

- *If you want to measure procedures in DLL's profile the necessary DLL's .*

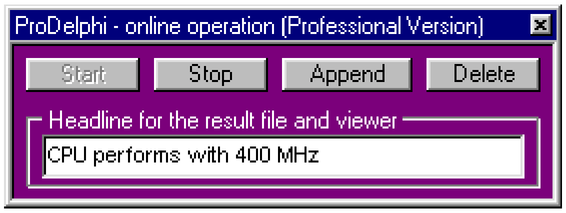
- Recompile the program (*or DLL's*).

To allow simultaneous measuring of DLL's and programs, all files in the units search path are profiled!!! (unless they are write protected !!!). The unit search path must be exactly the same for program an DLL, both DPR-files have to be in the same directory !!!

Files in and below the Delphi LIB and SOURCE directories path will not be profiled.

After that, start the program and let it do its job.

A small window appears that allows you to start and stop the time measurement:


ProDelphi - online operation (Professional Version)
Start
Stop
Append
Delete
Headline for the result file and viewer
CPU performs with 400 MHz

Depending on the profiling options the button 'Start' is enabled (No Autostart option) or not (with autostart option). With autostart option the measurement starts with the start of the testee. Without the autostart option you have to press the start button when you want to start the measurement or insert calls into your sources for activation or deactivation. See chapter A5 for the complete description. After the program has ended, you can view the results of the measurement

by the built-in viewer of ProDelphi,

or if you have checked the option for ASCII-output, you can

load the file 'program-name.BEN' into Delphi

and maybe print it with Delphi.

For the Built-in viewer, just start ProDelphi again, select view, select the directory your EXE-file is stored in and select the file 'program-name.TXT'. A new window will open with a lot of information.

In principal this is all that has to be done. If you want to let the program run without time measurement, simply delete the compiler symbol PROFILE and make a complete compilation.

A1.1 Files created by ProDelphi or the measured program

ProDelphi creates the file PROFLST.ASC, it contains information about the procedures to be measured for profiling or traced for post mortem review. The file PROFILE.INI contents options for the time measurement and the last screen coordinates of the online operation window. The viewer will create the file PRONAME.HST if you use the history function (see A3).

Your compiled program creates PROGNAME.BEN, it contents the results of the time measurement in a printable format if you have checked 'Additional output in ASCII' when profiling. The file with the name PROGNAME.TXT contents the data in the ASCII-semicolon-delimited format for data base export and PROGNAME.TX2 for the headlines for the different runs (for the built-in viewer). It creates PROGNAME.SWO with the list of procedures that have to be deactivated for time measurement at next program start. If creates also a file with the name PROGNAME.NEV into which the names of the uncalled methods are stored. This file is used by the viewer.

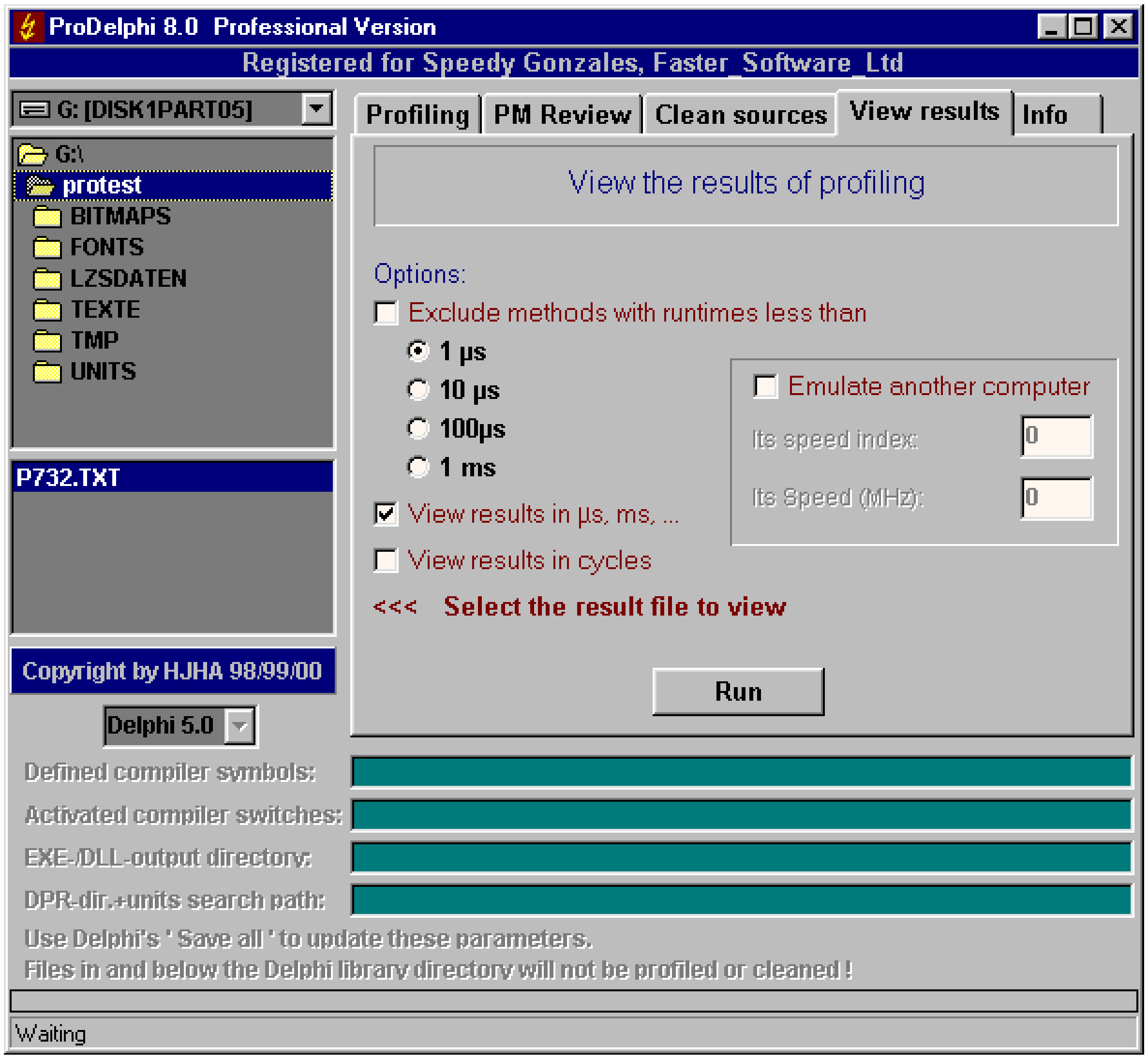
Your compiled program creates a file named PROGNAME.PMR in case you have selected post mortem review and an exception occured and was trapped. It contents the call stack.

All files are stored in the output directory for the *.EXE (**.DLL*) file.

To allow simultaneous measuring of DLL's and programs, all files in the units search path (except the Delphi LIB and SOURCE directories and below them) are profiled if they are not write protected !!!

A1.2 Checking the results with the Built-in Viewer

The most comfortable way to view the run times of your procedures, is to use the built-in viewer. Just select the output text file and click on the RUN-button.


ProDelphi 8.0 Professional Version

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G: [DISK1PART05]

G:\
protest
BITMAPS
FONTS
LZSDATEN
TEXTE
TMP
UNITS

P732.TXT

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Delphi 5.0

Profiling | PM Review | Clean sources | View results | Info

View the results of profiling

Options:

☐ Exclude methods with runtimes less than

● 1 µs
○ 10 µs
○ 100µs
○ 1 ms

☑ View results in µs, ms, ...

☐ View results in cycles

☐ Emulate another computer

Its speed index: 0

Its Speed (MHz): 0

<<< Select the result file to view

Defined compiler symbols:

Activated compiler switches:

EXE-/DLL-output directory:

DPR-dir.+units search path:

Use Delphi's ' Save all ' to update these parameters.

Files in and below the Delphi library directory will not be profiled or cleaned !

Waiting

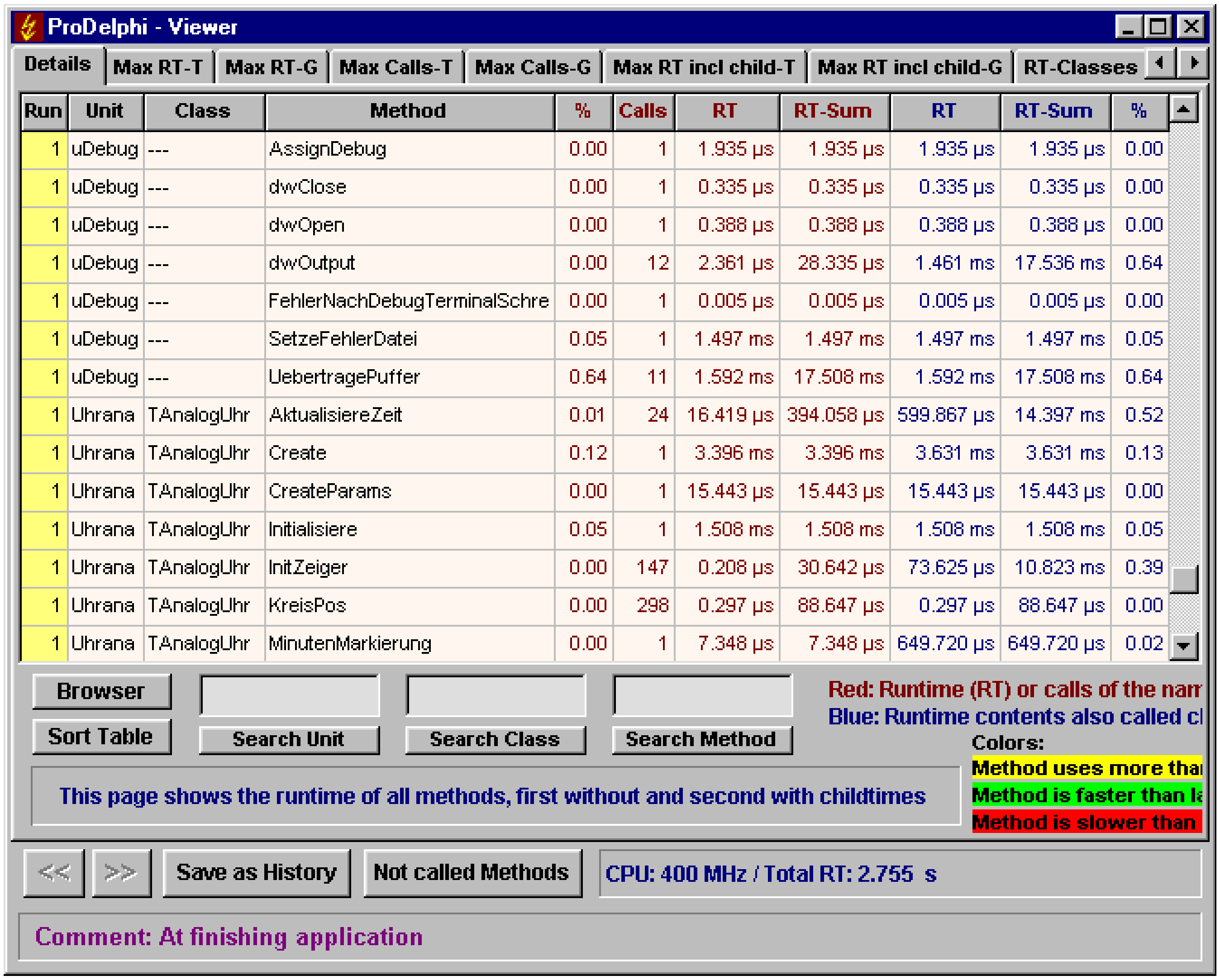
You can choose if you want to view the results in µs, ms ... or in CPU-Cycles.

Also you can exclude methods with less than 1µs, 10µs,100µs or 1ms.

Also you can emulate (recalculate) the measurements for a faster or slower PC. No need to install the IDE on that PC, just enter two constants in an edit field and let ProDelphi tell you how fast or how slow your program would perform on that PC (see chapter 1.3).

On clicking ‘Run’, a grid is shown, which gives you the results of the measurement. You just can scroll through the results or e.g. search a specific unit, class or method.

See next page please.


ProDelphi - Viewer

Details | Max RT-T | Max RT-G | Max Calls-T | Max Calls-G | Max RT incl child-T | Max RT incl child-G | RT-Classes

Run	Unit	Class	Method	%	Calls	RT	RT-Sum	RT	RT-Sum	%
1	uDebug	---	AssignDebug	0.00	1	1.935 µs	1.935 µs	1.935 µs	1.935 µs	0.00
1	uDebug	---	dwClose	0.00	1	0.335 µs	0.335 µs	0.335 µs	0.335 µs	0.00
1	uDebug	---	dwOpen	0.00	1	0.388 µs	0.388 µs	0.388 µs	0.388 µs	0.00
1	uDebug	---	dwOutput	0.00	12	2.361 µs	28.335 µs	1.461 ms	17.536 ms	0.64
1	uDebug	---	FehlerNachDebugTerminalSchre	0.00	1	0.005 µs	0.005 µs	0.005 µs	0.005 µs	0.00
1	uDebug	---	SetzeFehlerDatei	0.05	1	1.497 ms	1.497 ms	1.497 ms	1.497 ms	0.05
1	uDebug	---	UebertragePuffer	0.64	11	1.592 ms	17.508 ms	1.592 ms	17.508 ms	0.64
1	Uhrana	TAnalogUhr	AktualisiereZeit	0.01	24	16.419 µs	394.058 µs	599.867 µs	14.397 ms	0.52
1	Uhrana	TAnalogUhr	Create	0.12	1	3.396 ms	3.396 ms	3.631 ms	3.631 ms	0.13
1	Uhrana	TAnalogUhr	CreateParams	0.00	1	15.443 µs	15.443 µs	15.443 µs	15.443 µs	0.00
1	Uhrana	TAnalogUhr	Initialisiere	0.05	1	1.508 ms	1.508 ms	1.508 ms	1.508 ms	0.05
1	Uhrana	TAnalogUhr	InitZeiger	0.00	147	0.208 µs	30.642 µs	73.625 µs	10.823 ms	0.39
1	Uhrana	TAnalogUhr	KreisPos	0.00	298	0.297 µs	88.647 µs	0.297 µs	88.647 µs	0.00
1	Uhrana	TAnalogUhr	MinutenMarkierung	0.00	1	7.348 µs	7.348 µs	649.720 µs	649.720 µs	0.02

Browser | Sort Table | Search Unit | Search Class | Search Method

Red: Runtime (RT) or calls of the nam
Blue: Runtime contents also called cl
Colors:
🟨 Method uses more tha
🟩 Method is faster than la
🟥 Method is slower than

This page shows the runtime of all methods, first without and second with childtimes

<< | >> | Save as History | Not called Methods

CPU: 400 MHz / Total RT: 2.755 s

Comment: At finishing application

Alphabetically sorted results, first Units, second classes and third procedures

Explanation of this window:

CPU: nnn MHZ	giving the CPU - speed
Total RT: ttt	giving the runtime of all measured methods

The Sort Table - button:

The displayed table can be sorted after different criteria, just try it!

The History - button: see chapter A3

Meaning of **Run**:

Any time the program stores data into the result file, it puts a leading number before the measured times: the number of the measurement. With the Previous- or Next - button you can switch between different measurements. At the next run of the program the counting starts at 1 again.

Meaning of the RED columns:

%	Percentage of the total runtime the procedure took without their child procedures
Calls	How often the procedure was called

RT	Runtime of the procedure in CPU-cycles, µs, ms, sec or hours
RT-sum	RT * Calls

Meaning of the BLUE columns:

RT	Runtime of the procedure inclusive its child procedures in CPU-cycles, µs, ms, ...
RT-sum	RT * Calls
%	Percentage of the total runtime the procedure took inclusive her child procedures.

Meaning of the <<-Button and the >>-Button:

If your program has stored intermediate results into the result file (by using the ProDelphi-API or by Online operation) you can page back or forward in the result file.

Meaning of **'Comment':**

It is the headline that was inserted when the measurement was stored. In the example you see the default.

The other availlable pages show:

The 12 methods that consumed the most of the runtime (**exclusive** child procedures) given in a text- and a graphical representation

The 12 methods that were called most often displayed in a text- and a graphical representation

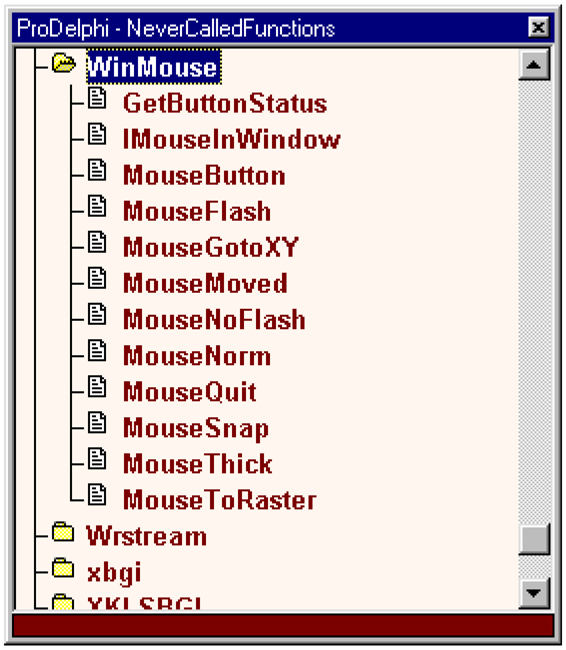
The 12 methods that consumed the most of the runtime (**inclusive** child procedures) given in a text- and a graphic representation

The 12 classes that consumed the most runtime

The 12 units that consumed the most runtime

The Not called Methods - button:

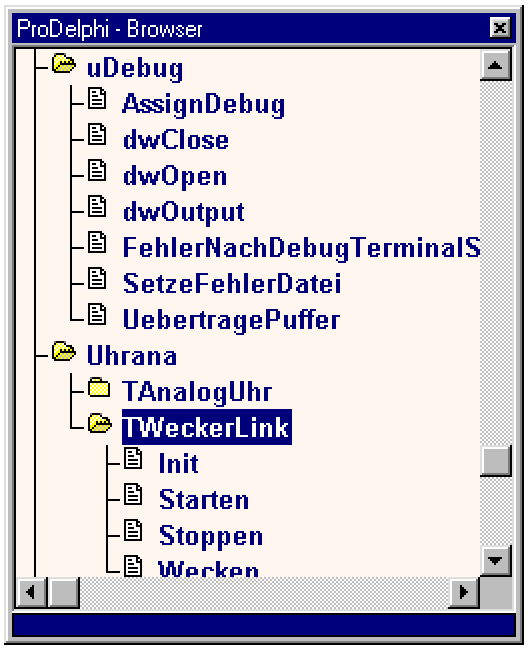
At the end of runtime the testee creates a file with the names of all uncalled methods. Using this button, these methods are displayed in hierarchical order: Unit - Class - Method.


ProDelphi - NeverCalledFunctions

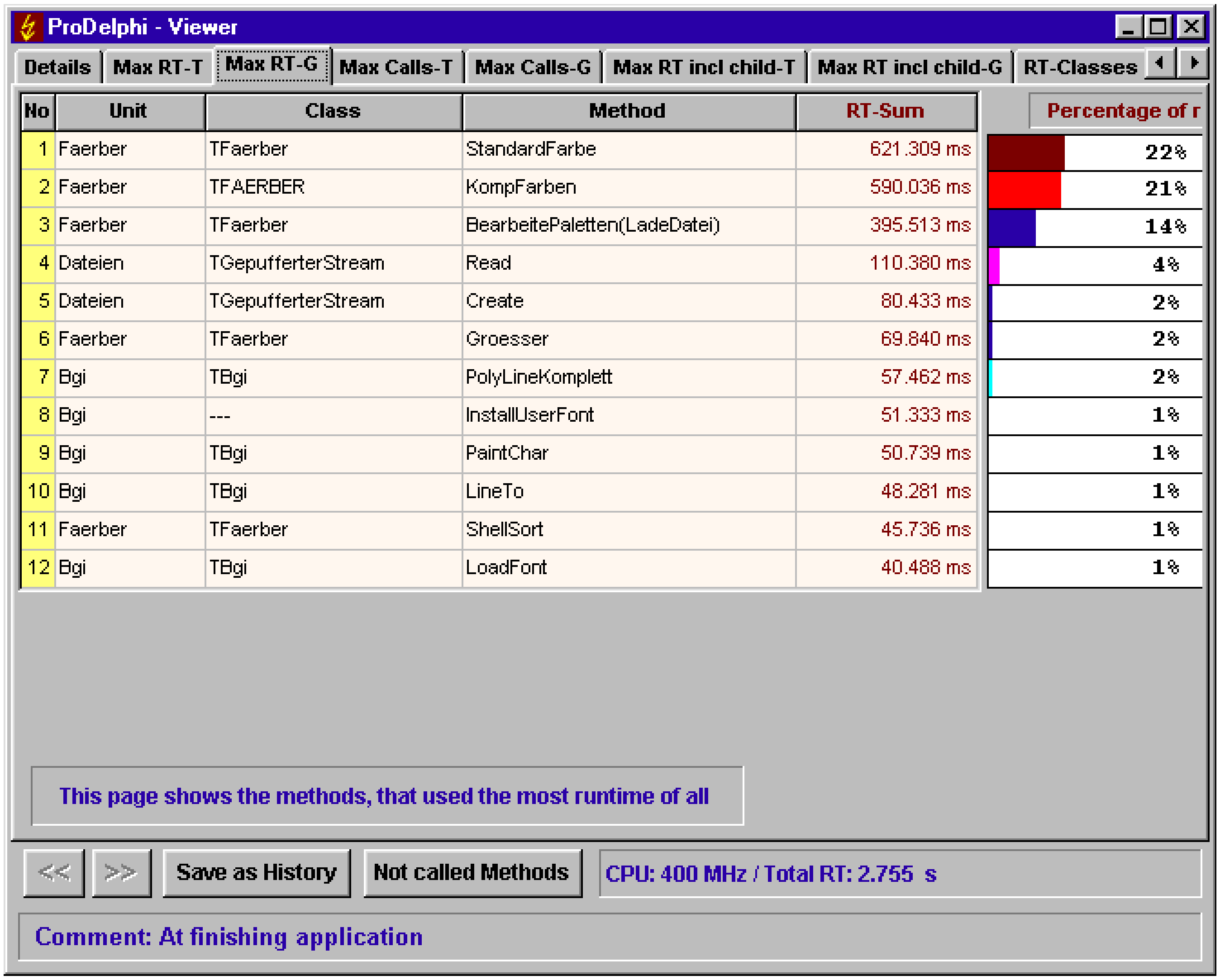
- WinMouse
  - GetButtonStatus
  - IMouseInWindow
  - MouseButton
  - MouseFlash
  - MouseGotoXY
  - MouseMoved
  - MouseNoFlash
  - MouseNorm
  - MouseQuit
  - MouseSnap
  - MouseThick
  - MouseToRaster
- Wrstream
- xbgi

The Browse - button:

It opens a small browser window (similar to the explorer) that shows units, classes and methods in a hierachial order. It can be used to quickly find the profiling results for a certain method.



See next page please for another viewer window example



No	Unit	Class	Method	RT-Sum	Percentage of r
1	Faerber	TFaerber	StandardFarbe	621.309 ms	22%
2	Faerber	TFAERBER	KompFarben	590.036 ms	21%
3	Faerber	TFaerber	BearbeitePaletten(LadeDatei)	395.513 ms	14%
4	Dateien	TGepufferterStream	Read	110.380 ms	4%
5	Dateien	TGepufferterStream	Create	80.433 ms	2%
6	Faerber	TFaerber	Groesser	69.840 ms	2%
7	Bgi	TBgi	PolyLineKomplett	57.462 ms	2%
8	Bgi	---	InstallUserFont	51.333 ms	1%
9	Bgi	TBgi	PaintChar	50.739 ms	1%
10	Bgi	TBgi	LineTo	48.281 ms	1%
11	Faerber	TFaerber	ShellSort	45.736 ms	1%
12	Bgi	TBgi	LoadFont	40.488 ms	1%

This page shows the methods, that used the most runtime of all

CPU: 400 MHz / Total RT: 2.755 s

Comment: At finishing application

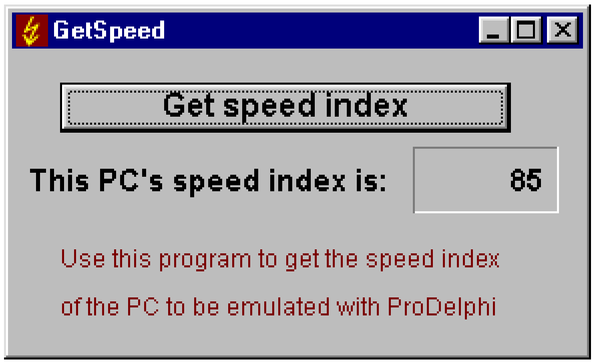
Example of: Maximum run time consuming methods (graphical)

A1.3 Emulation of a faster or slower PC

If you want to know, how fast (or slow) your program would perform on another PC, just use the program GetSpeed.exe to get the other PC's speed index, enter it in ProDelphi, enter the speed in MHz of the other computer and start the viewer. Automatically all measurements are recalculated for the other PC. ***Certainly the results are not as accurate as if measured on the original PC.***

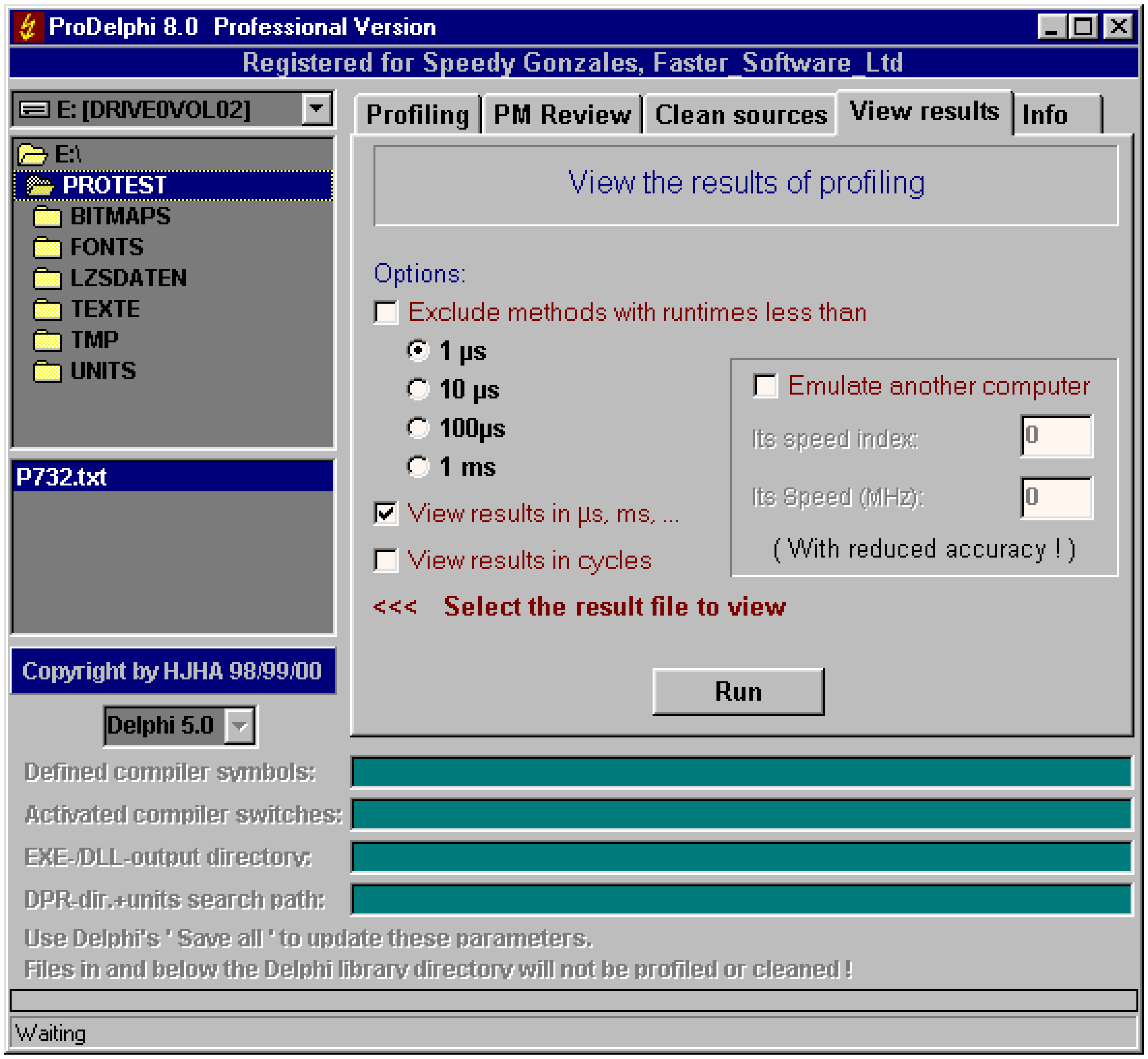
Limitation of use: If in your program you have a procedure that executes for a fixed time (e.g. for 1 sec), the emulation result for that procedure is wrong!

(The speed index and MHz'es of the PC on which ProDelphi is executed, is calculated automatically, so do not delete GetSpeed.exe after installing ProDelphi).



This PC's speed index is: 85

Use this program to get the speed index of the PC to be emulated with ProDelphi


ProDelphi 8.0 Professional Version
Registered for Speedy Gonzales, Faster_Software_Ltd
E: [DRIVE0VOL02]
E:\
PROTEST
BITMAPS
FONTS
LZSDATEN
TEXTE
TMP
UNITS
P732.txt
Copyright by HJHA 98/99/00
Delphi 5.0
Profiling
PM Review
Clean sources
View results
Info
View the results of profiling
Run
Waiting

Options:

- [ ] Exclude methods with runtimes less than
  - (●) 1 µs
  - ( ) 10 µs
  - ( ) 100µs
  - ( ) 1 ms
- [✓] View results in µs, ms, ...
- [ ] View results in cycles

- [ ] Emulate another computer

Its speed index: 0

Its Speed (MHz): 0

(With reduced accuracy !)

<<< Select the result file to view

Defined compiler symbols:

Activated compiler switches:

EXE-/DLL-output directory:

DPR-dir.+units search path:

Use Delphi's ' Save all ' to update these parameters.
Files in and below the Delphi library directory will not be profiled or cleaned !

A1.4 Checking the results with the optional ASCII-file

IF you have checked the option 'Additional output of results in ASCCI', a file with the name 'programname.BEN' is created. For each procedure one record is stored in that file. Below the content of this file is described:

a. Runtime of the procedure bodys *exclusive* called child procedures

- runtime of the procedure in percentage of all measured procedures
- number of calls
- runtime in µs, ms, sec, min, h (or alternatively in CPU-Cycles) given for a single call
- runtime sum (= runtime * number of calls)

b. Runtime of the procedure bodys *inclusive* called child procedures

- runtime in µs, ms, sec, min, h (or alternatively in CPU-Cycles) given for a single call
- runtime sum (= runtime * number of calls)

c. Summary

- the most often called procedures
- the most CPU-time consuming procedures

d. The class wich consumed the most runtime (= the sum of all method runtimes)

e. The total runtime of the tested program (= the sum of all measured procedures)
For a quick test, points a. and b. can be disabled.

For every procedure such line is given in the result file:

classname-MethodName	consumed time as described obove or
ProcedureName	consumed time as described above.

The sorting order of the listing is Unit-alphabetical, inside the units the order depends on the order of the procedures.

All times given are exclusive the time measuring itself !!!

A2 Getting exact results

If you measure program runtimes a few times, you will see that the measurement results differ from measurement to measurement with out that you have changed your sources. Two kind of results will offen differ: the runtime of a method and the percentage of their runtime of the complete program. The reasons are :

- there are events that disturb the measurement, e.g. programs running in the background.
- you measure methods which are activated by Windows more or less often,
- you measure operations which are started by an event a different number of times each measurement,
- you measure procedures which perform disk transfer, the data can be transferred to disk or to disk cache.

Every profiler has this problems. Because of the highest possible granularity of ProDelphi (1 CPU-cycle), you see these differences.

To get comparable measurements you need to take care, that the influence of disturbances is kept low. Here some hints:

A2.1 Common causes of disturbing influences outside of your program

Some disturbers everybody might be aware of:

- activated screen saver,
- Windows power management,
- background schedulers,
- online virus protection,
- automatic recognition of CD changing,
- temporary windows swapfile causes memory transfers of different time,
- dynamic Windows disk cache size causes a different amount of memory for each measurement.

These disturbing influences are easy to eliminate.

A2.2 Common causes of disturbing influences inside your program

Some disturbances you might have inside your measured program itself, these occure when you measure everything, e.g. by using the autostart function of ProDelphi:

- defining a Default Handler Procedure (is called for nearly every message your program receives),
- defining a procedure to handle mouse moves (called everytime you are moving the mouse cursor),
- defining a timer routine.

The three influences are also easy to eliminate. You only need to exclude these procedures from measurement. Another way is not to use the autostart function of ProDelphi but start measurement at the starting point of a certain action. How to exclude methods is described in Chapter A4, how to measure defined actions only is described in chapter A5.

A2.3 Common cause of disturbing influence is the PC's cache

The influence of the cache can't be easyly excluded. The only way is to produce exactly the same sequence of events two times every measurement and to start measurement with starting the second sequence by the programming API, switch it off at the end of the second sequence and store the measured data to disk (also by the ProDelphi API). This guarantees that as much code as possible is stored in the cache and that eyery measurement the same code and data is in the cache. Only if your program does exactly the same every measurement, you can compare the results and find out (e.g. by the history function of ProDelphi), if an optimization has decreased the runtime or not.

A2.4 Summary

If you eliminate the disturbances mentioned in A2.1 / A2.2 and measure defined actions, you will see the differences between two measurements is very low, most times only a few CPU-cycles. Larger differences appear only when neasuring procedures with disk transfers. A good trick is, to use the second measurement for comparison with later optimizations, specially when the disk transfer is a reading transfer. The first run of the program will get the most data into disk cache, the second measurement reads the data from cache.

A3 Interactive optimization

Interactive optimization means that you optimize something, check if it has brought you significant decreasement of runtime or not, make the next step of optimization and so on.

Important is, which method is worth to be optimized: A method, that uses 10 % runtime must be optimized by 10 % to decrease the total program runtime by 1 % !!!

There are different ways of comparing the measurement results:

- to use the ASCII-output and print it,
- to use the viewer and make screen dumps or
- to use ProDelphi's history function.

A3.1 The history function

The history function of the viewer enables you to compare your measurement results with ONE preceeding run. So you can see, if an optimization has brought an increasement or a decreasement of runtimes.

Having made a measurement, you can decide, if you want to store the results being displayed in the viewers table on disk or not.

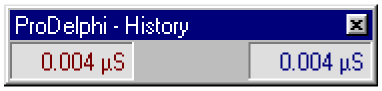
If you have stored the results on disk, the next time you open the viewer window, automatically the history stored before is read and compared with the actual measurement. By colouring the cells of the viewers table, you have a quick overview about all changes of runtime: Red means method got slower, green means method got faster and white mean that no essential change occured.

To get the cell colored, the methods change of runtime must be essential. Essential means, it must have changed so much, that it influenced the programs runtime by 1 % or more.

If you succeed in excluding disturbing effects as mentioned before, you can use the history very well. E.g., I had to optimize the processing of measured values. I simply didn't use the auto start function and used the API to switch masurement on and off. I switched id on after processing 10 measurement values (all called methods were in the cache then), measured processing of 100 values, stopped measurement and stored the data on disk. To be sure that no disturbing actions occure any more, I repeated this and compared the measurement results with the history function. When there there were nearly no differences between two measurements, I started to optimize and always used the history to compare, if my optimization was successful or not.

A3.2 Practical use of the history function

- Make a measurement for the defined action you want to optimize.
- Load the results into the viewer.
- Click on the history button to store these results into the history file.
- Optimize a method that is worth to be optimized.
- Repeat your measurement.
- Load the new data into memory.
  If you made the function significantly faster, the optimized method should be colored green now.
  If your method is slower now, it is colored red.
  If there is no significant difference, it is colored white.
- Select a cell in that line, where your changed method is displayed.
- A small window pops up. It shows the average runtime of a procedure stored in the history file. If '---' is displayed, the method is not present in the history file.



A4 Measuring only parts of the program

A4.1 Exclusion of Parts of the program

All Windows programs are message driven. So, if you define a function that, for instance, handles mouse moves, ProDelphi will give you a very big percentage of runtime for this procedure because it will be activated any time you move the mouse over a window of your program. But you might not be interested in this procedure.

What I described above, is the default setting of ProDelphi: all procedures are measured, the measurement starts with the start of the program (if option 'Activation of measurement / At program start' is checked).

For normal you would like to measure only certain actions of the program and might want to exclude functions which cannot be optmized (e.g. because they are very simple).

There are different ways of excluding parts of the program:

1. Files in and below the Delphi LIB and SOURCE directories are always excluded.

2. Exclusion of complete units

   - Enable write protection for the units not to compile
     (unless you don't check 'Process write protected files', they are not profiled) or
   - insert the following statement before the first line of the unit:

     //PROFILE-NO

3. Exclusion of DLL's but measuring the program

   Just compile the DLL without the compiler definition PROFILE and the program with that definition.

4. Exclusion of the whole program but measuring the DLL's

   Compile the program without the compiler definition PROFILE and the DLL with that definition.

5. Exclusion of functions

   Before profiling insert statements before and after the procedures that
   have to be excluded to switch off the vaccination by ProDelphi:

   ```
   //PROFILE-NO             |
   Excluded procedure(s)    |       These statements are not removed by ProDelphi.
   //PROFILE-YES            |
   ```

6. Automatic exclusion

You can exclude procedures automatically by checking the option 'Deactivate functions consuming < 1 µs'. Checking this option means that those procedures, which are at least called 10 times during the measurement period and consume an average of less then 1 µs will not be measured the next time the program is started. For that purpose a file is created when the program ends. It contains all the procedures which have to be deactivated. When you start your program next time the file will be read and all named procedures are deactivated. It might be that after the next run of your program again some lines will be appended with procedures to be deactivated.

The procedures that are not to be measured are stored in the file 'ProgramName.SWO'.

Caution, the next run of ProDelphi will delete this file. If you want to make the exclusion permanent, put a //PROFILE-NO statements into your source code.

A4.2 Dynamic activation of measurement

This is the best way of profiling. Normally one optimizes a certain function of a program, mostly that which takes too long. E.g., if a program processes measured values and paints nice pictures and the number of processed values are not enough, one only wants to optimize that part of the program and not the painting.

In this example it would be nice to switch on the measurement every time a measured value has to be processed and to switch off after. The advantage is, that the number of runtimes seen in the viewer is drastically reduced, the other is, that it is much easier to see, which function should be optimized.

There are three ways for dynamical activation of measurement in ProDelphi (1. and 2. can be used simultaneously):

1. By dialog

   In the main window of ProDelphi under the option ‘Activation of measurement’ select:
   ‘By entering a selected method’. After profiling you can select until 16 methods which should start the measuring. If you have profiled your program before already, you as well can use the button ‘Select activating methods only’. So you easily can change between different activating methods.
   Measuring is switched on, when the selected method is entered and stops when the last statement of the method is processed.

2. By inserting special comments into the source code.

   Inserting a comment //PROFILE-ACTIVATE into the source code, the next procedure or function after that comment automatically starts measurement. Also here you have to check ‘By entering a selected method’ in the main window of ProDelphi. You can optionally select further activating methods, but it is not necessary.

3. By using API-calls.

   This method is described in the next chapter. It is the only way versions of ProDelphi earlier than 8.0 could handle this problem. In principle, this way can still be used, but it is not very comfortable. Using that third method you always need to insert two calls, one for activation and one for deactivation.

A5 Programming API

A5.1 Measuring defined program actions through Activation and Deactivation

A good way to make different result files comparable, is to measure only those actions of your program you want to optimize. In that case do not check the button for 'automatic start' of measurement. Do the profiling of your source code and insert activation statements at the relevant places.

Example1:

You only want to know how much time a sorting algorithym consumes and how much time all called child procedures consume. You are not interested in any other procedure. The sorting is started by a procedure named button click.

```
PROCEDURE TForm1.ButtonClick;
BEGIN
{$IFDEF PROFILE}asm...end; Try; asm... call ProfInt.ProfEnter;...end; {$ENDIF}
   SortAll;  // the procedure of which you want to know the runtime
{$IFDEF PROFILE}finally; asm...; mov cx,number; call ProfExit; end; end; {$ENDIF}
END;
                                   // @self if used inside classes otherwise NIL
```

You can modify the code in three different ways:

```
{ possibillity 1 }
PROCEDURE TForm1.ButtonClick;
BEGIN
{$IFDEF PROFILE}asm...end; Try; asm... call ProfInt.ProfEnter;...end; {$ENDIF}
{$IFDEF      PROFILE}try; ProfInt.ProfActivate;{$ENDIF}
   SortAll;  // the procedure which you want to know the runtime of
{$IFDEF      PROFILE}finally; ProfInt.ProfDeactivate; end; {$ENDIF}
{$IFDEF PROFILE}finally; asm...; mov cx,number; call ProfExit; end; end; {$ENDIF}
END;

{ possibillity 2 }
PROCEDURE TForm1.ButtonClick;
BEGIN
{$IFDEF      PROFILE}try; ProfInt.ProfActivate;{$ENDIF}
   SortAll;  // the procedure which you want to know the runtime of
{$IFDEF      PROFILE}finally; ProfInt.ProfDeactivate; end; {$ENDIF}
END;

{ possibillity 3 }
//PROFILE-NO
PROCEDURE TForm1.ButtonClick;
BEGIN
{$IFDEF      PROFILE}try; ProfInt.ProfActivate;{$ENDIF}
   SortAll;  // the procedure which you want to know the runtime of
{$IFDEF      PROFILE}finally; ProfInt.ProfDeactivate; end; {$ENDIF}
END;
//PROFILE-YES
```

You should use possibillity 1 or 3 because a new profiling does not change your code, Possibillity 2 is changed by the next profiling into possibility 1.

Be sure that you use more than one space between $IFDEF and PROFILE you inserted, otherwise the statements will be deleted the next time that the source code is vaccinated by ProDelphi. Alternatively you also can use lower case letters.

Example 2:

You want to activate the time measurement by a procedure named button1 and deactivate it by a procedure named button2 use the following construction:

```
//PROFILE-NO
PROCEDURE TForm1.Button1;
BEGIN
{$IFDEF      PROFILE}ProfInt.ProfActivate; {$ENDIF}
END;

PROCEDURE TForm1.Button2;
BEGIN
{$IFDEF      PROFILE}ProfInt.ProfDeactivate; {$ENDIF}
END;
//PROFILE-YES
```

Deactivation switches off the measurement totally. That means that no procedure call is measured until activation.

A5.2 Preventing to measure idle times

Some Windows-API functions and Delphi functions interrupt the calling procedure and set the program into an idle mode. A well-known example is the Windows-call MessageBox. This call returns to the calling procedure after the a button click. Between call and return to the calling procedure, the program consumes CPU cycles. In such a case, it would be nice, not to measure this idle time.

A lot of Windows-API calls and some Delphi-calls are replaced automatically by the Unit ProfInt.PAS. For the above named example MessageBox, there is a redefiniton. It automatically interrupts the counting of CPU-cycles for the calling procedure only and reactivates it after returning from windows.

If other procedures are called while waiting for user action, they are measured normally, e.g. if a WM_TIMER messages is received and you have defined a handler for it.

To make this possible, there are the ProDelphi-API-calls StopCounting and ContinueCounting. In chapter A9 you can find the list of calls, which are redefined in the unit ProfInt.PAS. They automatically call these functions before using the original Windows- or Delphi calls. Some functions are replaced by the profiler (e.g. Application.HandleMessage).

Some functions cannot be replaced by ProfInt.PAS, specially object-methods. If you use such methods and do not want to measure their idle times, just exclude these calls by inserting the following lines:

```
{$IFDEF      PROFILE}ProfInt.StopCounting; {$ENDIF}

      Object.IdleModeSettingMethod;

{$IFDEF      PROFILE}ProfInt.ContinueCounting; {$ENDIF}
```

Important:

Use more than one space between $IFDEF and PROFILE, otherwise the statements will be removed with the next profiling or by cleaning the sources. Alternatively you also can use lower case letters.

A5.3 Programmed storing of measurement results

Normally at the start of the program the file for the measurement results is emptied and only at the end of the program the measurement results are appended. If you need more detailed information, you can insert statements into your sources to produce output information where you like to.

Just insert the statement

```
  {$IFDEF     PROFILE}Proftime.ProfAppendResults; {$ENDIF }
```

into your source. In that case a new output will be appended at the end of your file and all counters will be reset.

Normally the headline of the result file will be 'At finishing application' any time new results will be appended to the file.

For this example you might want to use a different headline. If so, you can set the text for the headline by inserting

```
  {$IFDEF     PROFILE}Proftime.ProfSetComment('your special comment'); {$ENDIF}
```

into your source.

Another way to produce intermediate results is to use the *online operation window*. Any time you click on the 'Append'-button the actual measurement values are appended to the result file and all result counters are set to zero (see chapter A5 also).

Important:

Use more than one space between $IFDEF and PROFILE, otherwise the statements will be removed with the next profiling or by cleaning the sources. Alternatively you also can use lower case letters.

A6 Options for profiling

Profiling options are divided into three groups:

- Code instrumenting options (or vaccination options): How and what to vaccinate.

- Runtime measurement options: How to measure and what to do the results.

- Activation of measurement: Where or when to start measuring runtimes.

A6.1 Code intrumenting options:

Changing these options after profiling DO afford a new profiling !!!

Profile Assembler procedures

Assembler code is normally not profiled (often assembler is a result of an optimization process). In the professional version this feature can be enabled.

Initialization and finalization

Normally the initialization and finalization parts of the units are not measured. In case you want to do this, check the appropriate option if you use the keywords INITIALZATION and FINALIZATION in your units.

Profile local procedures

Normally local procedures are not measured, if you activate this option they are. (NOT availlable for the freeware version.)

Process write protected files

checking this option means, that all write protections for your source files are deleted and the files are profiled. Without this option, write protected files are not processed.

A6.2 Runtime measurement options

Changing these options after profiling do NOT afford a new profiling.

Additional output of results in ASCII (printable or viewable with Delphi)

with the sub-option:

- Output in CPU-Cycles instead of µSeconds

This option enables the creation of a printable file. You can open this file with Delphi and print it (landscape format should be preferred).

Deactivate functions consuming < 1 µS

Any time the measurement results are stored in the result file, those procedures that are called at least ten times and consume less then 1 µS are deactivated for the future. The deactivated functions are stored in the file 'ProgramName.SWO' for the next run. (Feature NOT availlable for the freeware version).

Inherited for parent

This option is only valid for methods (procedures and functions belonging to objects or classes).

Normally times are measured separate for each procedure. Use this method if you want, that, if a method calls a method with the same name of an upper class (e.g. by INHERITED), the time of the inherited method is counted for the calling method.

Testee contains threads

If this option is checked, the measurement is enhanced for handling threads. It is not useful to check this option if your program does not create threads, the program only runs slower. But it is absolutely necessary to check this option if you use threads, otherwise the results of the measurement are completely wrong.

A6.3 Measurement activation options

Changing these options after profiling do NOT afford a new profiling.

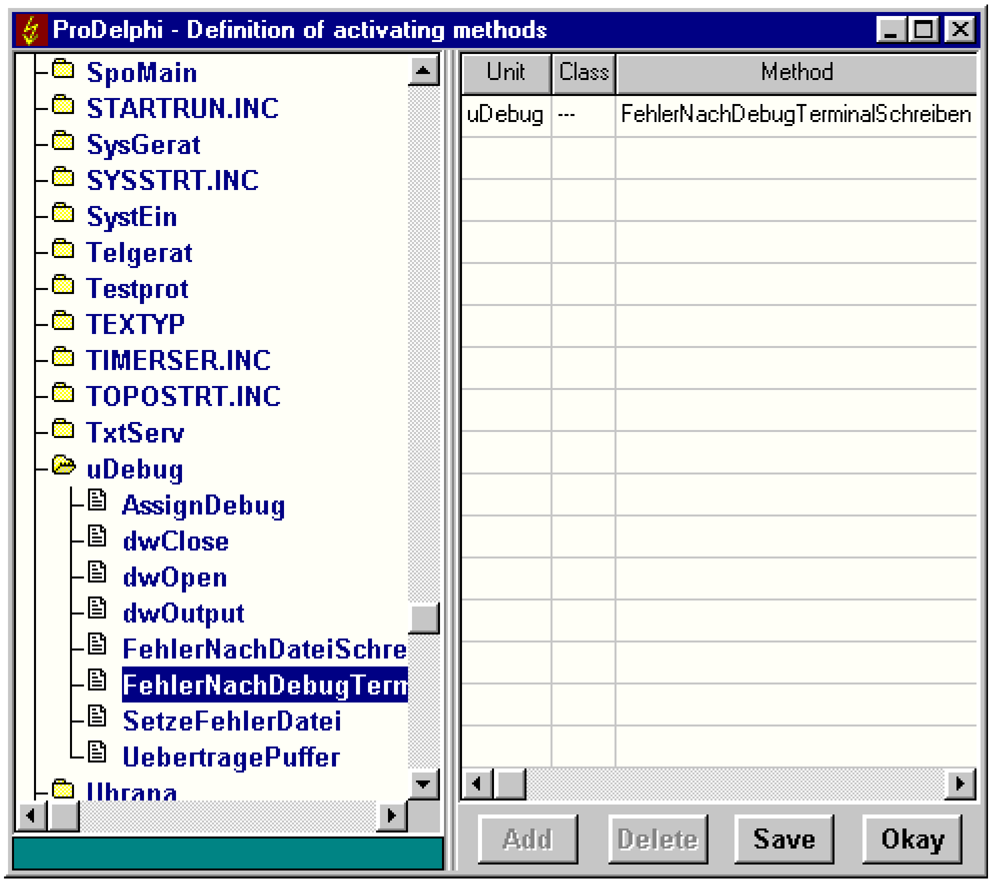
At program start (default)

If this option is checked, the time measurement will start as soon as your program is started. In that case the 'Start'-button in the online operation window is disabled and the stop button is enabled. If the option is not checked the 'Start'-Button is enabled and the 'Stop'-button is disabled.

By entering a selected method

You'll be requested to enter methods (or you have already inserted //PROFELE-ACTIVATE statements into your source code (see also chapter A 4.2). If you use this option, you should not use the Online-operation window.

See next page for an example


ProDelphi - Definition of activating methods

- SpoMain
- STARTRUN.INC
- SysGerat
- SYSSTRT.INC
- SystEin
- Telgerat
- Testprot
- TEXTYP
- TIMERSER.INC
- TOPOSTRT.INC
- TxtServ
- uDebug
  - AssignDebug
  - dwClose
  - dwOpen
  - dwOutput
  - FehlerNachDateiSchre
  - FehlerNachDebugTerm
  - SetzeFehlerDatei
  - UebertragePuffer
- Uhrana

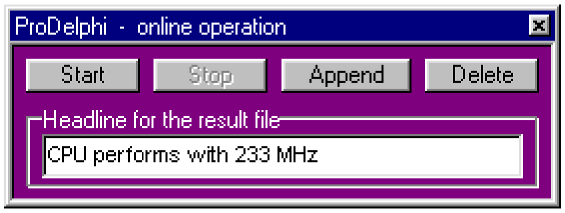
Unit	Class	Method
uDebug	---	FehlerNachDebugTerminalSchreiben

By API-Calls or online operation window

(see chapter A5.1 and A7 for details)

A7 Online operation of the profiled program

With the online-operation window


ProDelphi - online operation

Headline for the result file: CPU performs with 233 MHz

you can start and stop the time measurement. This enables you to measure only certain activities of your program. The 'Start'-button enables the measurement, the 'Stop'-button disables it. With the 'Delete'-button all counters are set to zero. The 'Append' - button appends the actual counter values to the result file and sets the counters to zero.

You can edit the text which is the headline for the results in the ASCII-File. For the built in viewer, any time, the results are stored, the 'Run-Number' is incremented and you can switch between different runs with the viewer.

The default value for the headline for intermediate results is:

'CPU performs with XXX MHz' where XXX depends on your PC.

A8 Profiling Dynamic Link Librarys (DLL's)

DLL's can be profiled the same way as programs. The only difference is, that, if you measure a DLL without the rest of the program, you won't have the online-operation window.

If you need the online-operation window, just insert two items into the DPR-file of your main progam manually:
In the USES-clause you need to insert: {$IFDEF PROFILE } Unit ProfOnli, {$ENDIF }
before Application.Run; you need to insert: {$IFDEF PROFILE } ProfOnli.ProfOnlineOperation; {$ENDIF}

All other necessary ProDelphi-units are linked into the DLL as well as into the program. There are only two small Units to be included: ProfInt (the interface to the DLL with the ProDelphi measurement functions) and the calibration unit ProfCali with is used by ProfInt. These two are included into program and DLL. But they are really small.

A9 Treatment of special Windows- and Delphi-API-functions

Some functions set the program into an idle mode until an event occurs and the function returns. It's not useful to measure these idle times. Because of that reason, some functions are redefined in the unit ProfInt.PAS or are replaced by the profiler in the source code. The result is that the idle time of the calling procedure is not counted, but other procedures called while waiting are still counted.

Redefinition is always done the same way, this is shown be the example for the Windows Sleep function (defined in ProfInt.PAS):

```
PROCEDURE Sleep(time : DWORD);
BEGIN
  StopCounting;
  Windows.Sleep(time);
  ContinueCounting;
END;
```

Because of this redefinition, the ProfInt-unit must be named after the units Windows and Dialogs. This is normally done. The only exception is, if you name these units in the implementation part of the unit. Delphi itself places them into the interface part.

If you find functions you want also to exclude from counting, you can make own definitions according to the example.

A9.1 Redefined Windows-API functions

- DispatchMessage, DialogBox, DialogBoxIndirect, MessageBox, MessageBoxEx, SignalObjectAndWait
- WaitForSingleObject, WaitForSingleObjectEx, WaitForMultipleObjects, WaitForMultipleObjectsEx
- MsgWaitForMultipleObjects, MsgWaitForMultipleObjectsEx, Sleep, SleepEx, WaitCommEvent
- WaitForInputIdle, WaitMessage and WaitNamedPipe.

A9.2 Redefined Delphi-API functions

- ShowMessage,
- ShowMessageFmt and
- MessageDlg.

A9.3 Replaced Delphi-API functions

- Application.MessageBox,
- Application.ProcessMessage and
- Application.Handle Message.

There are some VCL-functions which can't be replaced or redefined because they are class methods, it would be much to complicated. If you encounter measurement problems, just include them into StopCounting and ContinueCounting. An example for such method is TControl.Show.

A10 Conditional compilation

Conditional compilation is fully supported. The only thing you have to do is:

- In the main window of ProDelphi check the correct version of ProDelphi,
- select the DPR-file of the program you want to profile and the compiler symbols and switches are read from the DOF-file. The standard symbols CPU386, WIN32 and VER90/VER100/VER120/VER130 are defined automatically.

A11 Limitations of use

Console applications have no online operation window. Procedures in a DPR-file can not be measured. The measured times are always between 0 and 10 % higher than the program really runs. The reason is that the program code is not so often replaced in the cache than without measuring.

For the purpose of vaccinating the source code, ProDelphi reads the sources. It is absolutely necessary, that the program can be compiled without any compiler errors. ProDelphi expects code to be syntactically correct.

As ProDelphi does not make a complete syntax analysis, it might occur, that not all places to insert the time measurement statements could be found. Maybe that some strange code constructs have been forgotten by me. As mentioned before, the large project, which was optimized with ProDelphi, was written by 12 different programmers, all their code was recognized correctly. Also the VCL could be compiled after profilation (all units of Delphi 3 have been profiled, except those, which used OBJ-fiiles which were missing). In case ProDelphi does not recognize code correctly, you would get a compiler error by Delphi. In such a case, try to structure your source more simple. If that doesn't help, send me an E-Mail with the code.
Procedures which have the first 'BEGIN' statement and the last 'END' statement in the same line, are NOT vaccinated.
It's not a bug !!! It's a feature !!!

While measuring, a user stack is used by the profiler unit. The maximum stack depth is 2400 calls. If a pocedure calls itself (recursive procedure), it only needs one entry in the profiler units stack.

The freeware version of ProDelphi can only measure 30 procedures, the professional version can measure 16000 procedures.

A problem for measurement is Windows itself. Because it is a multitasking system, it may let other tasks run besides the one you are just measuring. Maybe only for a few microseconds. So your program can be interrupted by a task switch to another application. I've made tests and let the same routine again and again and each time I've got slightly differing results.

Don't forget the influence of the processor cache also. You might get different results for each measurement, just because sometimes the instructions are loaded into the cache already and sometimes not. This might be the reason, that sometimes an empty procedure needs some CPU-cycles for getting the code into the cache. **The larger the cache size, the better the results ! The profiling procedures use the cache too !**

Then there is the CPU itself. The modern CPU's like Intels Pentium or AMD's K6 are able to execute instructions parallel. When the profiler inserts instruction, the parallelity is different from without these instructions. That's another reason, why the runtime with measurement differs from that without measuring.

All my tests have shown, that the larger the cache is, the smaller the difference between the real runtime and the measured runtime is. With an AMD K6, the differences were only a few CPU-cycles.

If your measured program uses threads, the results are less correct. The reason is, that a thread change is not recognized at the time of change. It is recognized at the next procedure entry.

Be aware that, if you measure procedures that make I/O-calls, you might also get different results each time. The reason is the disk cache of Windows. Sometimes Windows writes into the cache sometimes directly to the disk.

A12 Assembler Code

Pure Assembler procedures and functions (e.g. FUNCTION Assi : Integer; asm mov eax,2; end;) are profiled only in the Professional version.

If it is absolutely necessary to measure such procedures with the Freeware version, just put an additional BEGIN before the asm statement and an additional END after the last statement (e.g. FUNCTION Assi : Integer; BEGIN asm mov eax,2; end; END;)

A13 Modifying code vaccinated by ProDelphi

While working on the optimization of your program you can of cause modify your code. The only limitation is, that, if you define new procedures and want them to be measured, you have to let ProDelphi process your code another time. It is NOT necessary to delete the old statements inserted by ProDelphi before.

A14 Error messages

In case of errors an error message is displayed by ProDelphi at the bottom line of its window (e.g. file-I/O-errors). If that occurs, have a look into the profiling directory.

Vaccinating a file is done in this way:

- the original file *.PAS is renamed into *.PAY (or *.DPR into *.DPY and *.INC into *.INY),

- after that the renamed file is parsed and vaccinated, the output is stored into a *.PAS-file (or *.DPR / *.INC),

- the last step to process a file is to delete the saved file, except an error occurs before.

This is done for all files of that directory. In case that an error occurs you can rename the saved file to *.PAS/*.DPR/*.INC.

Before doing so, maybe it's worth to have a look into the output file. In case of a parsing error, you can send the original file + the incomplete output file to the author for the purpose of analysis.

A15 Security aspects

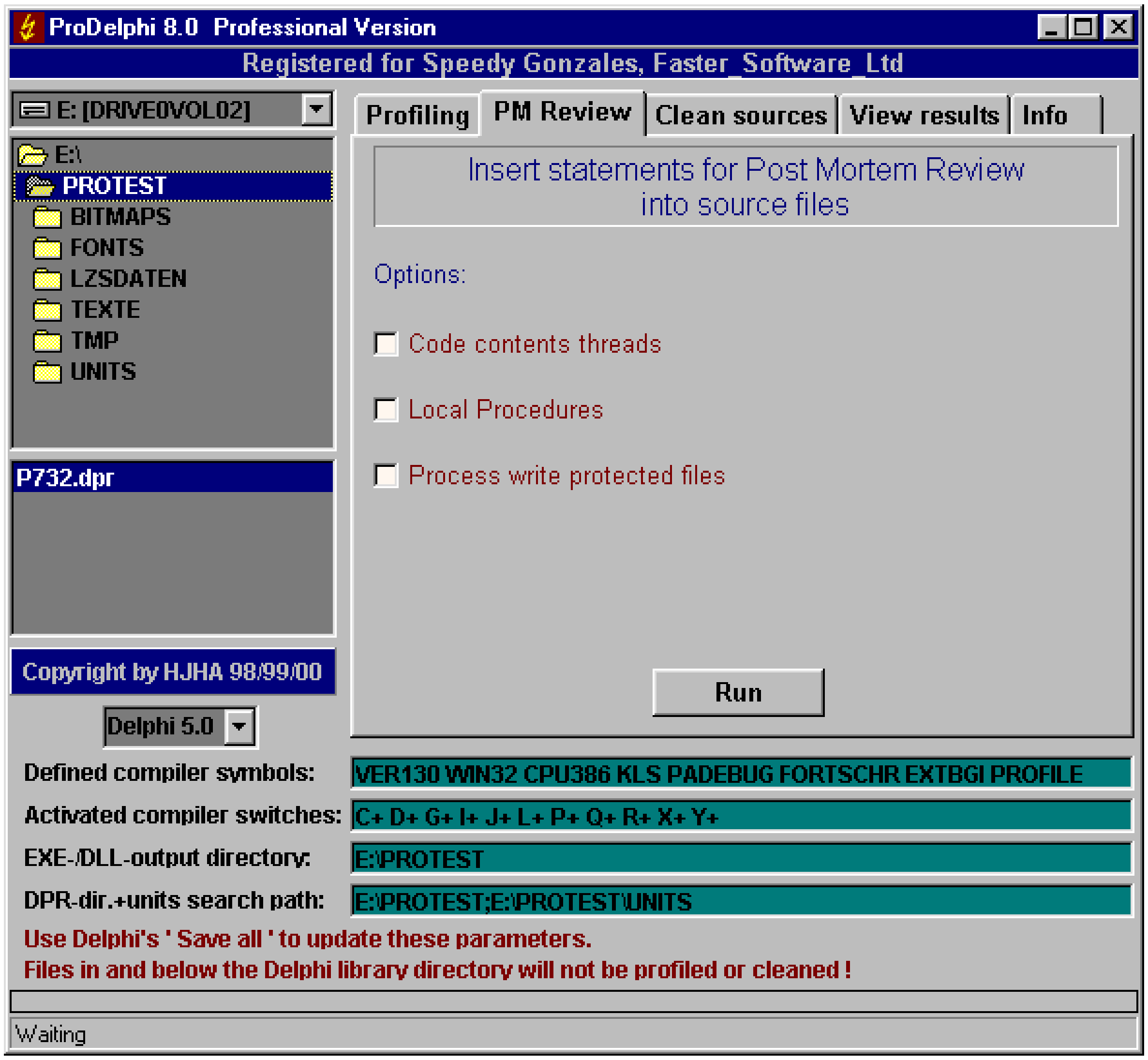
- Save all your sources before profiling (e.g. by zipping them into an archive).
- ProDelphi checks, if you have enough space on disk to store a profiled file before profiling it. ProDelphi assumes that the output file uses 4 times the space of the original file (normally it uses less). If there is not sufficient space, it will stop profiling.

Warning: On a system with Windows 95 < OSR 2.0, ProDelphi can not check the disk space! The API-call of Windows returns wrong values if the disk size is greater than 2 GB. ProDelphi does not know, if this is the case, so it will not check for sufficient space on Windows 95 < OSR 2.0. YOU HAVE TO TAKE CARE IN THIS CASE. In case of any I/O-error, ProDelphi will stop profiling immediately. See A12 on how to restore the original file !!!

At the start of the profiling procedure, you will see a popup window that informs you if you are using Windows 95 < OSR 2.0. (On Windows NT 4.0 the free disk space can be calculated correctly.)

B Post mortem review

As mentioned above, ProDelphi can vaccinate your sources with statements for post mortem review. It also interpretes the sources and inserts statements at the begin and at the end of a procedure.



Insert statements for Post Mortem Review into source files

Options:

- Code contents threads
- Local Procedures
- Process write protected files

Defined compiler symbols: VER130 WIN32 CPU386 KLS PADEBUG FORTSCHR EXTBGI PROFILE

Activated compiler switches: C+ D+ G+ I+ J+ L+ P+ Q+ R+ X+ Y+

EXE-/DLL-output directory: E:\PROTEST

DPR-dir.+units search path: E:\PROTEST;E:\PROTEST\UNITS

Use Delphi's ' Save all ' to update these parameters.

Files in and below the Delphi library directory will not be profiled or cleaned !

In case of an aborting because of an exception, a message box will open which will give you the filename where the call stack is listed (ProgramName.PMR).

Also here the source comments //PROFILE-NO and //PROFILE-YES can exclude parts of your sources.

For the availlable options see chapter A4.

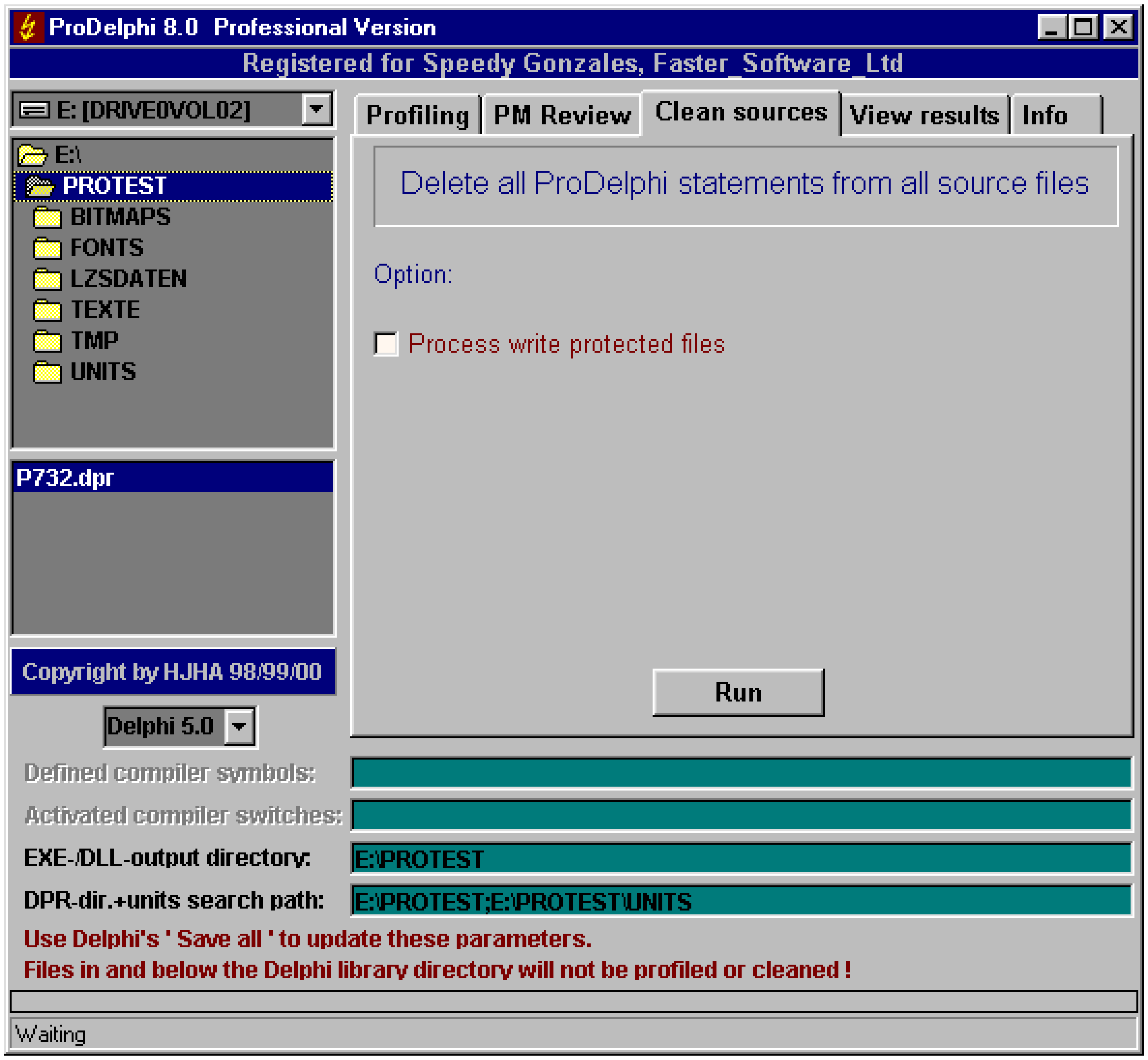
The handling of Prodelphi is the same as for profiling. You also have to define the compiler symbol PROFILE:

If you have vaccinated ProDelphi with statements for post mortem review and work with the IDE of Delphi and an exception occurs, you must continue your program unless you have deactivated the option 'Stop at exception'.

Limitation of use: Stack overflows are not caught because ProDelphi itself needs stack space. And if there is no stack any more, ProDelphi can not work properly. The overflow might as well appear in the ProDelphi stack tracing routines. ProDelphi can not handle this.

C Cleaning the sources

If you want to delete all lines that ProDelphi inserted into your sources, use the 'Clean' command.



Delete all ProDelphi statements from all source files

Option:

☐ Process write protected files

Defined compiler symbols:

Activated compiler switches:

EXE-/DLL-output directory: E:\PROTEST

DPR-dir.+units search path: E:\PROTEST;E:\PROTEST\UNITS

Use Delphi's ' Save all ' to update these parameters.
Files in and below the Delphi library directory will not be profiled or cleaned !

It is not necessary to clean the sources if you simply want to let your program run without time measurement for a short time only. In that case just delete the compiler symbol 'PROFILE' in your projects options.

It is also not necessary to clean the sources if you want to use the 'Profile' command another time. Each profiling process automatically deletes all old ProDelphi statements in the source code and inserts new statements. For that purpose it scans the code for statement that start with

```
  {$IFDEF PROFILE}  and with  {$IFNDEF PROFILE }
```

and deletes them completely (except you have more than 1 space between IFDEF and PROFILE.

D Compatibility

ProDelphi was testet under
- Windows 95 and Windows NT 4.0,
- AMD K6 166 / 233 MHz, AMD K6-2 266 / 300 MHz, AMD K6-3 400 MHz, AMD Athlon 600 MHz,
- Pentium Overdrive 120 MHz, Pentium II / III 400 MHz, Pentium Celeron 400 MHz.

E Installation of ProDelphi

ProDelphi is most comfortably installed with the included setup program (Setup.Exe). This program copies all necessary DLL's into the Windows system directory and all needed units into the Delphi-LIB-directory. Also it creates an entry in the list of programs (Windows Start menu / Programs) and integrates ProDelphi into the Delphi tools menu.

F Description of the result file (for data base export and viewer)

The result file can also be used for export to a data base (e.g. Paradox or DBase) or a spreadsheet program like Quattro Pro.

File content of 'progname.TXT' (one line for each procedure):

```
run; unitname; classname; procedurename; % of RT; calls; RT excl. child; RT-sum excl. child; RT incl. child; RT-sum incl. child; % incl. child
```

File content of 'progname.TX2' (one line for each run):

```
run; CPU-clock-rate; headline for that run
```

G Updating / Upgrading of ProDelphi

Updates and upgrades can be loaded via authors home page. Every new release will automatically be stored there. Just click on 'Additional information' to see which version is actual.

H How to order the professional version of ProDelphi

Customers who ordered the professional version of ProDelphi will get a serial number to upgrade to the Professional version. Just start the program ProfUpg.EXE (it is sent withe the serial number) and enter the information you have got by e-mail. At the next start of ProDelphi, it will be a Professional version. This key is also valid for upgrading following versions. If a bugfix is made or a minor upgrade is done, it will be stored on my homepage. Just download from there and you can continue to use the new program as Professional version.

Customers who ordered the professional version can have a link to their company in my customers reference list, just send me an e-mail.

The serial number to upgrage to the professional version can be ordered by sending a registration form to me (see the file ORDER.TXT) or use the ShareIt shareware registration service (see the files REGISTER.ENG and REGISTER.GER).

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J History

Version 1.0 : 9/97	First release
Version 2.0 : 2/98	Successfully used to optimize VICOS P500 for Sixth Railways project (China).
Version 3.0 : 4/98	Enhanced accuracy, brought to the public via Compuserve
Version 3.1 : 5/98	Enhanced granularity (1 CPU - cycle), published by Torry's Delphi Pages
Version 4.0 : 10/98	Viewer Added, export to data base, support of Delphi 4.
Version 5.0 : 11/98	Profiling statements changed to assembler (less overhead)
Version 5.3 : 12/98	DLL-Support added
Version 6.0 : 2/99	Treating of Read Only attribute, DLL-support enhanced, ProDelphi homepage
Version 6.3 : 5/99	Profiling assembler routines
Version 6.4 : 5/99	Setup program added
Version 6.5 : 7/99	Profiling of multiple directories added
Version 6.6 : 8/99	History function added
Version 7.0 : 9/99	Adaption to Delphi 5
Version 7.2 : 11/99	Profiler enhanced: Processing of relative pathnames.
Version 7.3 : 01/00	Profiler enhanced: Better accuracy, lower overhead, $IFOPT processing, Professional version can measure 16000 methods (before 10000).
Version 7.4 : 02/00	Browser added for checking which procedure was not called.
Version 7.5 - 7.61:03-04/00	Different bug fixes
Version 7.62:04/00	Professional version can measure 32000 methods (before 16000). Units search path editable, minor bugfixes
Version 8.0 : 04/00	Dynamic activation and deactivation of measurement by dialog and by special comments in the source files, emulation of other PC's, main form arranged nicer, profiling log added.

K Literature

How to optimize for the Pentium family of microprocessors by Agner Fog / 1998-08-01
C/C++ user journal 'A Testjig Tool for Pentium Optimization' by Steve Durham (December 1996).

L Used code

TStringAlignGrid 2.0 from Andreas Hoerstemeyer is used for the viewer.