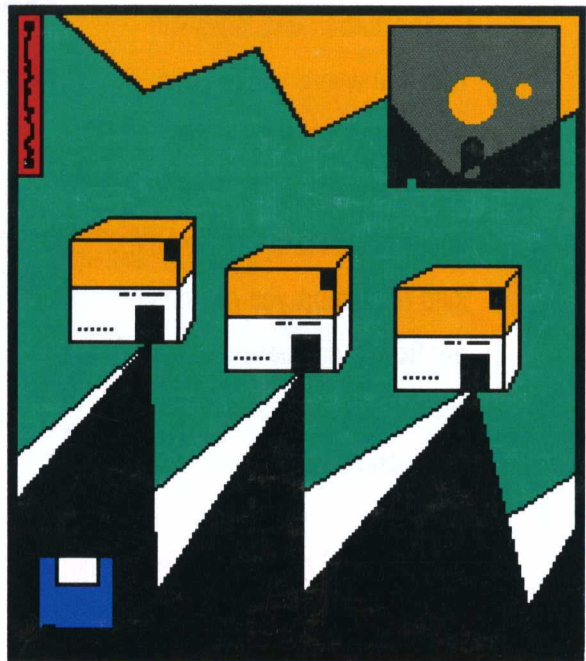


# TURBO LANGUAGES

PROFESSIONAL POWER AT YOUR FINGERTIPS

**B O R L A N D**



**W**hether you're a programming novice or a professional developer, Borland's Turbo languages give you power without compromise. From the ease-in simplicity of Turbo Basic® to rocket-fast Turbo Pascal® and powerful Turbo C®—we'll even walk you into the realm of artificial intelligence with Turbo Prolog®. And give you the most advanced Turbo Assembler® and stand-alone Turbo Debugger® you can buy.

The Turbo Languages will take you where you're going in style, with smoothly integrated environments. Powerful integrated debugging. And the kind of support you can only get from a company that respects your individuality as much as you do.

## **TECHNICAL EXCELLENCE**

All our software gives you lightning speed and thunderous power to finish even the most complex projects in record time. Besides carving out new industry standards, it works within existing ones—creating solutions that build on what you already know.

## **EASY FLEXIBILITY**

Borland software lets you work the way you want to. It's easy to install, learn, and use so you can be up and running right away and keep running at your own pace.

## **SOLID SUPPORT**

Borland software keeps you moving without interruptions. Our responsive customer service and expert technical support are free—and the best in the industry.

So take a look inside. Make your choices. Then visit your Borland dealer today.



# BORLAND'S NEW TURBO PROFESSIONAL SERIES



For professionals who need state-of-the-art development tools, here is everything you need—your favorite Turbo language, and our new Turbo Assembler, and Turbo Debugger—all rolled into one package. All designed to work together, and bundled for added value to you.

Choose your Professional Series product—Turbo C Professional or Turbo Pascal Professional. Both include the latest version of your language of choice (Turbo C or Turbo Pascal), our new Turbo Assembler, and new Turbo Debugger. The new versions of both Turbo C and Turbo Pascal allow you to compile, edit, and debug (with an integrated, source-level debugger) all in the integrated Turbo environment. (See page 6 for details on

Turbo C 2.0 and page 8 for Turbo Pascal 5.0.) Turbo Assembler is faster than other assemblers and MASM compatible (4.0, 5.0, and 5.1—even MASM can't say that!). (See page 3.) Turbo Debugger is our revolutionary new code *and data* debugger that can handle *any size program!* (See page 4.) Read on for more information about our new Turbo language products.

For the best value on a complete set of state-of-the-art development tools, ask for Turbo C Professional or Turbo Pascal Professional!

# TURBO ASSEMBLER<sup>®</sup> & TURBO DEBUGGER<sup>®</sup>

New Turbo Assembler and Turbo Debugger: two state-of-the-art development tools in one package.

## NEW TURBO ASSEMBLER— FAST, COMPATIBLE

Lets you write the tightest, fastest code. You can use it on your existing code; it's fully MASM compatible, 4.0, 5.0 and 5.1. You choose the level of compatibility—even MASM can't do that. Turbo Assembler takes you beyond MASM, with significant new Assembly language extensions, more complete error checking, and full 386 support. Turbo Assembler is designed for easy interfacing with high-level languages like Turbo Pascal and Turbo C. We use Turbo Assembler to write Quattro<sup>®</sup> and Turbo Pascal<sup>®</sup>; here's why:

- Faster than other assemblers
- MASM compatible (4.0, 5.0, and 5.1)
- Significant new assembly language extensions
- Easy interfacing with high-level languages including Turbo C<sup>®</sup> and Turbo Pascal
- Full 386 support



## TURBO ASSEMBLER

BGIDEMO BENCHMARK	TURBO ASSEMBLER	Microsoft <sup>®</sup> Assembler
Assembly time (seconds)	<b>9.34</b>	27.46
Link time (seconds)	<b>4.15</b>	10.51
<b>FEATURE COMPARISON</b>		
MASM compatible (4.0, 5.0, 5.1)	<b>Yes</b>	No
Thorough type checking	<b>Yes</b>	No
Nested structures and unions	<b>Yes</b>	No
Multimodule cross reference	<b>Yes</b>	No
Assemble multiple files	<b>Yes</b>	No

Run on IBM PS/2 model 60 using Turbo Assembler version 1.0, Turbo Linker version 2.0, Microsoft Macro Assembler version 5.10, Microsoft Overlay Linker version 3.64.

## NEW TURBO DEBUGGER— DEBUGS ALL SIZES

With EMS support, remote debugging and 386 virtual machine debugging, there's no limit to the size of program you can debug.

### SEE WHAT'S HAPPENING

Overlapping windows give you multiple views of the program. Unique "session-logging" feature tracks and records your every move.

### YOU'RE IN CONTROL

Ordinary debuggers only get you to a stop, then they stop. When our breakpoints are triggered you can stop, log an expression, or execute program code. And all our breakpoints are conditional.

### UNIQUE DATA DEBUGGING FEATURES

You can browse through your data, inspect arrays, and walk through linked lists. All by point and shoot.

### BREAKPOINTS

- Actions: stop, run code, log expression
- Break on condition, memory changed
- Software ICE capabilities
- 386 debug register support
- Support for hardware debuggers

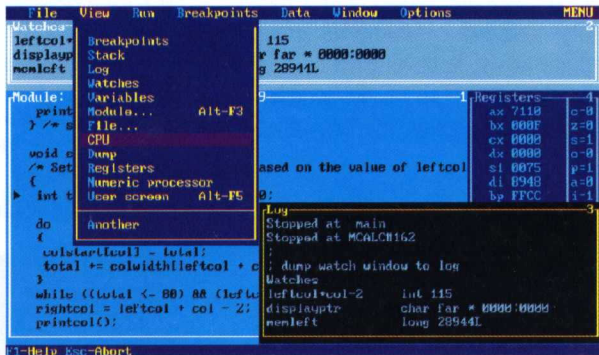
## TURBO DEBUGGER

FEATURE COMPARISON	TURBO DEBUGGER	CodeView®
Multiple overlapping views	<b>Yes</b>	No
386 virtual-86 mode debugging	<b>Yes</b>	No
Remote debugging	<b>Yes</b>	No
Data debugging	<b>Yes</b>	Partial
Generalized breakpoints	<b>Yes</b>	No
Session logging	<b>Yes</b>	No
Conventional memory used—80386	<b>Zero K</b>	230K
Conventional memory used—remote	<b>15K</b>	N/A

Turbo Debugger version 1.0, Microsoft CodeView version 2.2.

### DEBUG ANY PROGRAM

- Turbo Pascal, Turbo C, Turbo Assembler
- EMS support
- 386 virtual machine and remote machine debugging
- Supports CodeView® and .MAP-compatible programs



Shown here are views of source code, CPU registers, watch expressions, and a session log.

### DATA DEBUGGER

- Follow pointers through linked lists
- Browse through arrays and data structures
- Change data values

Minimum system requirements: For the IBM PS/2™ and the IBM® family of personal computers and all 100% compatibles. PC-DOS (MS-DOS) 2.0 or later. Turbo Debugger: 384K RAM minimum. Turbo Assembler: 256K RAM minimum.



# TURBO C®

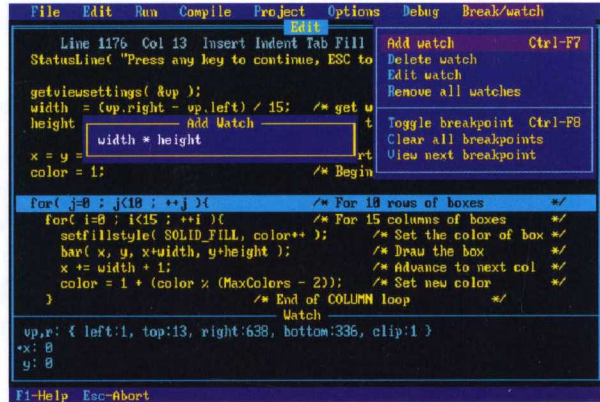
## NEW TURBO C 2.0 OPTIMIZING COMPILER WITH INTEGRATED SOURCE-LEVEL DEBUGGER

New Turbo C 2.0 is the *one* optimizing C compiler that does it all; nothing is half done or not done—instead Turbo C meets your every programming need. We wrote our best-selling word processor Sprint® with Turbo C; now you can write *your* best-seller with Turbo C 2.0.

At better than 16,000 lines a minute,\* Turbo C 2.0 compiles your code 20-30% faster than its predecessor Turbo C 1.5 which was already faster than any other C compiler.

## MAKE BUGS BUG OFF

Nice bugs are dead bugs, and Turbo C 2.0's integrated source-level debugger lets you find them and flatten them in a flash. You can set multiple breakpoints, watch variables and evaluate expressions—all from inside your integrated Turbo C environment.



The screenshot shows the Turbo C 2.0 source-level debugger interface. The main window displays C source code with a blue execution bar highlighting the current line. A 'Watch' window is open on the right, showing a list of variables and their values. The code includes a loop for drawing a grid of boxes. The watch window shows the expression 'width \* height' with a value of 42. The status bar at the bottom indicates 'F1-Help Esc-Abort'.

```
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 1176 Col 13 Insert Indent Tab Fill
StatusLine: "Press any key to continue, ESC to
getviewsettings( &wp );
width = (wp.right - wp.left) / 15; /* get w
height = (wp.bottom - wp.top) / 10; /* get h
x = y = width * height;
color = 1; /* Begin

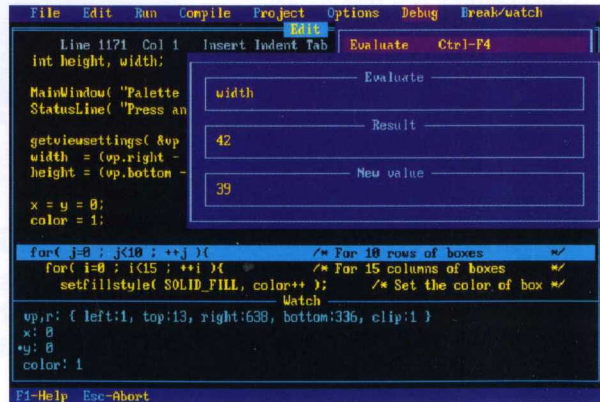
for( j=0 ; j<10 ; ++j ){ /* For 10 rows of boxes */
for( i=0 ; i<15 ; ++i ){ /* For 15 columns of boxes */
setfillstyle( SOLID_FILL, color++ ); /* Set the color of box */
bar( x, y, x+width, y+height ); /* Draw the box */
x += width + 1; /* Advance to next col */
color = 1 + (color % (MaxColors - 2)); /* Set new color */
} /* End of COLUMN loop */
} /* End of ROW loop */

Watch
wp.r: { left:1, top:13, right:638, bottom:336, clip:1 }
*x: 0
*y: 0
color: 1
F1-Help Esc-Abort
```

Debugging in the Turbo environment: Adding an expression in the Watch window in Turbo C. The Execution Bar highlights the next line the debugger will execute.

## THE NO COMPROMISE C

Produce professional-quality programs in a flash with support for six memory models (more than anyone else), inline assembler, automatic dependency checking, and over 430 optimized library functions.



The screenshot shows the Turbo C 2.0 source-level debugger interface. The main window displays C source code with a blue execution bar highlighting the current line. An 'Evaluate' window is open on the right, showing the expression 'width' with a value of 42. The code includes a loop for drawing a grid of boxes. The evaluate window shows the expression 'width' with a value of 42. The status bar at the bottom indicates 'F1-Help Esc-Abort'.

```
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 1171 Col 1
int height, width;
MainWindow( "Palette
StatusLine( "Press an
getviewsettings( &wp );
width = (wp.right -
height = (wp.bottom -
x = y = 0;
color = 1;

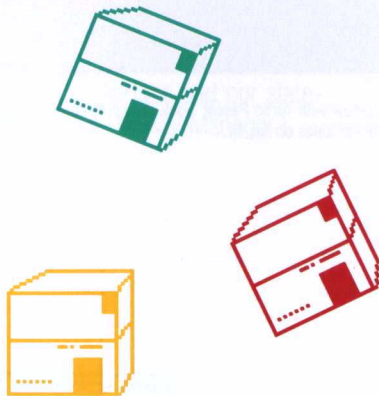
for( j=0 ; j<10 ; ++j ){ /* For 10 rows of boxes */
for( i=0 ; i<15 ; ++i ){ /* For 15 columns of boxes */
setfillstyle( SOLID_FILL, color++ ); /* Set the color of box */
} /* End of COLUMN loop */
} /* End of ROW loop */

Watch
wp.r: { left:1, top:13, right:638, bottom:336, clip:1 }
*x: 0
*y: 0
color: 1
F1-Help Esc-Abort
```

Using the Evaluate/Modify window with Turbo C: Look at expressions, examine structured data types, change variables on the fly.

## TURBO C 2.0 HAS THE BEST OF EVERYTHING

- Includes the compiler, editor, and debugger, all rolled into one
- Integrated source-level debugger lets you step code, watch variables, and set breakpoints
- Develop and debug production-quality code in all six memory models
- Inline assembler support
- Support for Turbo Assembler® and Turbo Debugger®
- Make facility with automatic dependency checking
- Over 430 library functions, including a complete graphics library
- Faster than ever; compiles and links 20-30% faster than Turbo C 1.5
- EMS support for editor
- Numerous levels of error checking with built-in Lint



## TURBO C PROFESSIONAL®

Turbo C 2.0 plus both Turbo Assembler & Turbo Debugger: the one C package that has everything. A complete set of tools that caters to every level of programming expertise.

## TURBO C 2.0 RUNTIME LIBRARY SOURCE CODE

The Runtime Library Source Code lets you get even more out of Turbo C's flexibility and control, with a library of more than 350 functions you can customize or use as is in your Turbo C programs. You get the source for the standard C library, math library and batch files to help with recompiling and rebuilding the libraries.

\*Run on an IBM PS/2 Model 60.

## TURBO C 2.0

HEAPSORT BENCHMARK	TURBO C 2.0	Microsoft® C 5.1
.OBJ size (bytes)	<b>843</b>	945
.EXE size (bytes)	<b>6896</b>	7731
Execution time (seconds)	<b>8.1</b>	12.2
FEATURE COMPARISON		
Integrated debugger	<b>Yes</b>	No*
Inline assembly	<b>Yes</b>	No
Auto dependency checking	<b>Yes</b>	No
EMS support for edit buffer	<b>Yes</b>	No
Device-independent graphics	<b>Yes</b>	No
Number of memory models	<b>6</b>	5

Heapsort compiled with full optimization. Benchmark run on an IBM PS/2 Model 60. \*Integrated debugger included with Quick C.

Minimum system requirements: For the IBM PS/2™ and the IBM® family of personal computers and all 100% compatibles. PC-DOS (MS-DOS) 2.0 or later. 448K RAM minimum.

# TURBO PASCAL®

## NEW TURBO PASCAL 5.0 WITH INTEGRATED SOURCE— LEVEL DEBUGGER

Turbo Pascal, the worldwide favorite with more than a million copies in use, just got even smarter. The best got better. Meet Version 5.0. In a word, it's revolutionary.

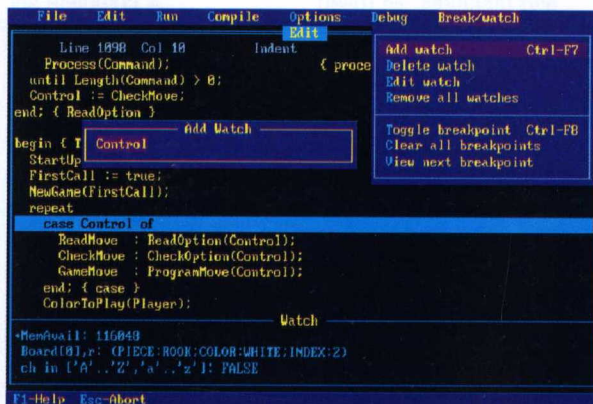
Not only do you compile at more than 34,000 lines a minute,\* you also get a sophisticated debugging environment—right at source-level. It's completely integrated and bullet-fast.

Turbo Pascal's new integrated debugger takes you inside your code for fast fixes. You step, trace, set multiple breakpoints. You modify variables—as you debug—and watch full expressions at run time.

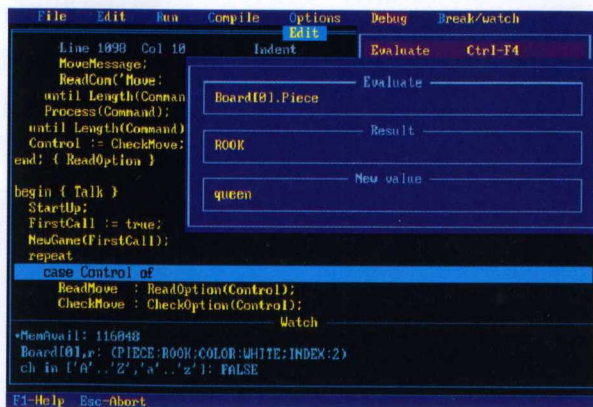
Turbo Pascal Version 5.0 is proof that—as always—we offer you the best programming tools in the world.

## DEBUGGING: THE INSIDE STORY

Turbo Pascal's new integrated source-level debugger takes you inside your code to fix errors fast. Everyone makes errors, but with our debugger, now you can find them and fix them.



Debugging in the Turbo environment: Adding an expression to the Watch window in Turbo Pascal. The Execution Bar highlights the next line the debugger will execute.



Using the Evaluate/Modify window with Turbo Pascal: Look at expressions, examine structured data types, change variables on the fly.



### JUST A FEW OF THE NEW FEATURES

- Includes the compiler, editor, and debugger, all rolled into one
- Integrated source-level debugger lets you step code, watch variables, and set breakpoints
- Overlays, including EMS support
- 8087 floating-point emulation
- Support for Borland's Turbo Assembler and Turbo Debugger
- Procedural types, variables and parameters
- Smaller, tighter programs: Smart linker strips unused code and data
- Constant expressions
- EMS support for editor

### SEPARATE COMPILATION

Break your code into Units. Your separately compiled Units can be shared by multiple programs and linked in a flash with Turbo Pascal's built-in Make utility and smart linker. (We give you a powerful library of standard Units including the spectacular Borland Graphic Interface and our state-of-the-art Overlay Manager.)

### TURBO PASCAL 5.0 RUNTIME LIBRARY SOURCE CODE

Modify the runtime library source code or use it as is. You get the assembly language and Pascal source to the System, Dos, Crt, Printer, and Turbo3 units. Comes with a batch file to help with recompiling and rebuilding TURBO.TPL.

### TURBO PASCAL PROFESSIONAL®

Turbo Pascal 5.0 plus both Turbo Assembler and Turbo Debugger: the one Pascal package that has everything. A complete set of tools that caters to every level of programming expertise.

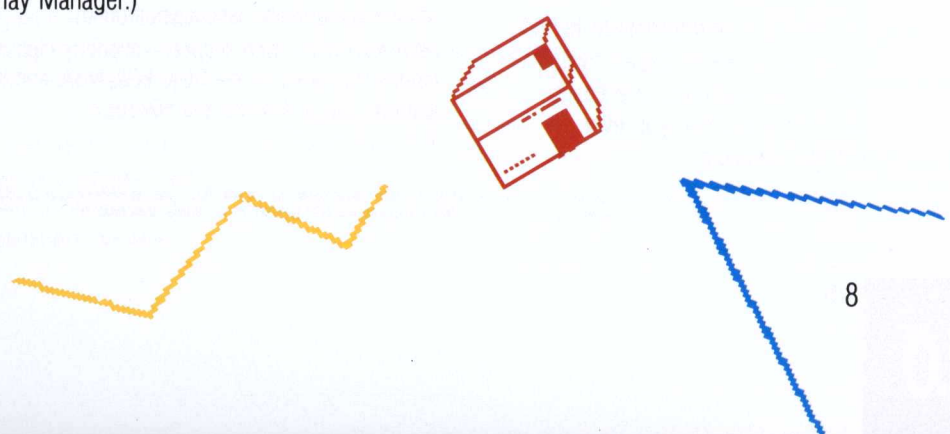
\*Run on an IBM PS/2 Model 60.

### TURBO PASCAL 5.0

	<b>TURBO PASCAL 5.0</b>	Turbo Pascal 4.0
<b>SIEVE BENCHMARK</b>		
.EXE size (bytes)	<b>1440</b>	1504
Execution time (seconds)	<b>6.15</b>	7.25
<b>FEATURE COMPARISON</b>		
Integrated debugger	<b>Yes</b>	No
Overlays, including EMS support	<b>Yes</b>	No
8087 floating-point emulation	<b>Yes</b>	No
Turbo Debugger support	<b>Yes</b>	No
Procedural types, variables, parameters	<b>Yes</b>	No
Smart linking of code and data	<b>Yes</b>	No
Constant expressions	<b>Yes</b>	No
EMS support for editor	<b>Yes</b>	No

Benchmark (25 iterations) run on an IBM PS/2 Model 60.

Minimum system requirements: For the IBM PS/2™ and IBM® family of personal computers and all 100% compatibles. PC-DOS (MS-DOS) 2.0 or later. 448K RAM minimum (256K for command-line version).



# TURBO PROLOG®

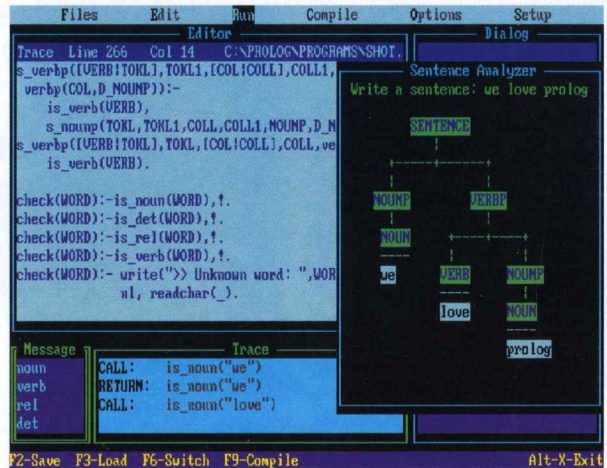
Now you don't have to be an expert programmer or artificial intelligence genius to harness the most powerful AI techniques and apply them to your real-world problems!

## POWER PROGRAMMING MADE EASY

Turbo Prolog gives you the power of an optimized native-code compiler that produces the smallest and fastest code. Turbo Prolog combines the most advanced compiler technology with an elegant, fully customizable development environment and integrated editor, automatic error detection, and powerful tracing features: trace by predicate and set trace points. To help make all this power easier to harness, it includes a 350-page tutorial with hundreds of examples and detailed instructions that will take you all the way from the basics to advanced application development.

## POWERFUL TOOLS MAKE IT HAPPEN

You also get all the tools to build your own powerful expert system and AI applications more easily and efficiently than you ever thought possible:



The results of a sentence analysis are shown in the output window while the source code in the edit window traces the execution. The trace window shows the predicates being traced.

- *An external database system* for developing large databases. Supports B+ trees and EMS.
- *Source code to a fully-featured Prolog interpreter.* Plus step-by-step instructions to adapt it or include it as is in your own applications!
- *Support for the Borland Graphics Interface,* the same professional-quality graphics as in Turbo Pascal and Turbo C.
- *Complete window management support*—build multi-window, colorful, resizable environments into your own applications
- *Powerful exception handling* and error trapping features.
- *Full compatibility with Turbo C* so the two languages can call forward and backward freely—and you can program with two of the most powerful languages around!
- *High-resolution video support*—supports high-resolution text modes supported by the CGA, EGA, VGA, and IBM-8514 adapters (up to 43x132 and 50x80).
- *And a lot more!*

Minimum system requirements: For the IBM PS/2™ and the IBM® family of personal computers and all 100% compatibles. PC-DOS (MS-DOS®) 2.0 or later. 384K RAM.



# TURBO BASIC®

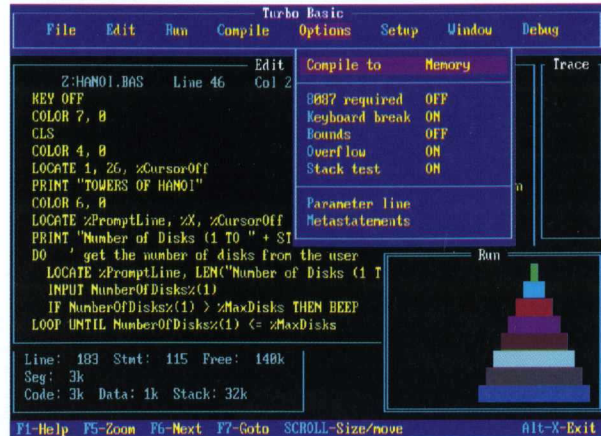
Turbo Basic is proof that BASIC doesn't have to be slow. With a compilation speed of up to 15,000 lines per minute,\* it's an absolute must for beginners and experienced programmers alike!

Turbo Basic is a complete development environment for the IBM PC and true compatibles, with an interactive editor, fast memory-to-memory compiler, and a trace debugging system. It's also compatible with Advanced BASIC.

## IT'S THE HIGH-SPEED BASIC YOU'D EXPECT FROM BORLAND!

- Compiles up to 15,000 lines per minute
- Easy-to-use windowed development environment
- Context-sensitive help
- Full 8087 math support
- Compatible with Advanced BASIC and GW BASIC
- Large program support
- Free MicroCalc spreadsheet with source code

Turbo Basic is written entirely in assembly language for maximum speed and efficiency. So the size of your program is limited only by available memory. And its integrated design permits quick program turnaround without sacrificing the powerful features experienced programmers demand!



Turbo Basic's development environment gives you overlapping windows, pull-down menus, and the ability to run text-based applications in a window.

## TECHNICAL FEATURES

- Program size limited only by available memory (no 64K limitation)
- Full recursion supported
- Standard IEEE floating-point format
- Floating-point support, with full 8087 (math co-processor) integration
- Software emulation if no 8087 present
- EGA, CGA, and Hercules support
- Access to local, static, and global variables
- Full integration of the compiler, editor, and executable program, with separate windows for editing, messages, tracing, and execution
- Compile, runtime, and I/O errors place you in the source code where the error occurred
- New long integer (32-bit) data type
- Full 80-bit precision

\*Run on an IBM PS/2 Model 60.

Minimum system requirements: For the IBM PS/2™ and the IBM® family of personal computers and all 100% compatibles. PC-DOS (MS-DOS®) 2.0 or later. 384K. One floppy drive.



# **B O R L A N D**

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