

Visual Basic® 6  
Database  
Programming Bible



# Visual Basic® 6 Database Programming Bible

**Wayne S. Freeze**



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## Visual Basic® 6 Database Programming Bible

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# About the Author

**Wayne S. Freeze** is a full-time author and computer technology consultant. He has written nine different books on Visual Basic and SQL Server since he began his career three years ago.

He lives in Beltsville, Maryland, with his lovely wife, Jill, and their wonderful children, Christopher, age six, and Samantha, age five. Jill is a well-respected writer and Microsoft beta tester, specializing in Microsoft Office, Internet Explorer, and Windows. Chris is perhaps the youngest person to beta test software for Microsoft, having tested both Windows 98 and Microsoft Millennium, among other products, in his short career. Sam, on the other hand, loves to sit on Wayne's lap, and one day hopes to write books just like her mom and dad.

Together, they live in a house full of animals, including a golden retriever named Lady Kokomo and four cats named Pixel, Terry, Cali, and Dusty. Wayne also has a pet stingray named Raymond, after his father-in-law. Raymond loves to eat worms from Wayne's hand (the stingray, that is, not his father-in-law).

Wayne maintains a Web site at [www.JustPC.com](http://www.JustPC.com) that contains information about the various books he and his wife have written. Please take the time to visit their Web site and sign their guest book.

*This book is dedicated to the newest member of my family, Dusty.*





# Preface

---

**W**ith respect to the development of database applications, Visual Basic is the language of choice for programmers all over the world. There are many reasons they choose Visual Basic: one, it is easy to learn how to use; two, you can build complex applications faster in Visual Basic than in any other programming language; and three, Visual Basic programs are easy to debug. In addition, there is a lot of specialized support built into Visual Basic for developing database applications. Not only can you develop traditional, forms-oriented database applications using Visual Basic, you can also use it to develop backend database programs for your Web server that are far more efficient than traditional PERL scripts or Active Server Pages.

Most of the Visual Basic books on the market today, however, downplay these database aspects in favor of all of the other neat features built into the language. While calling API functions from Visual Basic and developing Add-ins for the IDE can be useful topics, I cover far more database-oriented material than you would find in a typical Visual Basic programming book by focusing strictly on database programming aspects. You'll benefit from the more focused coverage, because you'll learn about the database features that you need to know and which will make you a more productive database programmer.

## Who Should Read This Book

If you read the back cover, you'll find that this book is aimed at beginning to advanced readers. That's quite a challenge. I don't want to bore advanced programmers, who may want to learn those dirty tricks that would make their applications more efficient, yet I don't want to lose novice database programmers who could benefit from those same tricks.

I'm going to assume that everyone reading this book is familiar with how to create and debug a Visual Basic program — not just the simple “Hello World” variety, but one that had so much code, for instance, it didn't work the first time you tried to compile and run it. I'll introduce you to any other information you'll need beyond this level.

Advanced readers may benefit from some of the more introductory material, because I often use nontraditional ways of doing things. (I'm known as The Lazy Programmer, because I try to take advantage of every shortcut available to me, as long as it saves me work in the long run.) After this initial review, advanced readers can then dig into why they should be using both the COM+ Transaction Server and the Microsoft Message Queues with their IIS Application-based application.

## What This Book Covers

This book is designed to be the only combination reference and tutorial you will need for building Visual Basic database applications. To accomplish that, this book covers the following database systems:

- ◆ Microsoft SQL Server 7
- ◆ Microsoft Jet 3.51/4.0
- ◆ Oracle 8i

Because much of the material you need to know about database programming is common to all three database servers, I have presented it first, in the following list of topics:

- ◆ Database Programming Fundamentals
- ◆ ActiveX Data Objects (ADO)
- ◆ ActiveX Data Object Extensions (ADOX)
- ◆ Traditional client/server applications
- ◆ IIS Applications
- ◆ Bound controls
- ◆ Stored procedures
- ◆ COM+ Transaction Server
- ◆ Microsoft Message Queues
- ◆ XML

Once I finish covering the common material, I'll focus on each individual database server to give you the specific knowledge you need to build efficient database applications. For each of the database servers, I'll cover these topics:

- ◆ Database server tools and utilities
- ◆ Useful SQL language extensions
- ◆ ADO considerations
- ◆ Unique data types and their Visual Basic equivalents
- ◆ Security mechanisms
- ◆ Creating stored procedures
- ◆ Performance considerations

The accompanying CD-ROM contains all of the sample programs found in this book, plus a sample database that you can use to test these programs. It's my belief that the best way to learn programming is to study as many programs as possible. Since the complete sample programs are on disk, you can load them, try them out, and modify them to see how they work, and hopefully incorporate the same techniques into your own applications.

## What This Book Doesn't Cover

This book will not teach you the fundamentals of Visual Basic programming. If you don't know what a `For Next` loop or a `Function` is, run to the nearest bookstore and get a copy of *Visual Basic 6 for Dummies* by Wallace Wang. When you finish that book and understand the material in it, you'll be ready for this book.

While this book includes a primer on relational database concepts and the SQL language, I suggest that you read *SQL for Dummies* by Allen G. Taylor for a more in-depth coverage of SQL and relational databases. You may also want to check out *Microsoft SQL Server 7 for Dummies* by Anthony T. Mann and *Oracle 8i for Dummies* by Carol McCullough for more information about the specific database servers covered in this book.

Another thing to consider is that the emphasis in this book is on database programming. While this is a fairly broad topic, there are many things you might want to include in your programs that I might not cover, such as how to construct help files, how to use resource files to solve localization issues, and how to send e-mail messages using MAPI. You might check out the *Visual Basic 6 Bible* by Eric A. Smith, Valor Whisler, and Hank Marquis, or some of my other Visual Basic books. You can find a complete list of books that I have written at [www.JustPC.com](http://www.JustPC.com).

## Hardware and Software Requirements

I wrote this book using two computers: one (called Mycroft) for running Visual Basic, and another (known as Athena) to run my database servers plus the COM+ Transaction Server. Mycroft is a Gateway 9100 laptop with a Pentium 200 processor and 64MB of main memory, along with Windows 98 Second Edition, Visual Basic 6 Enterprise Edition, Office 2000, and the SQL Server 7 utilities. I also installed ADO version 2.5 on my development machine from the Platform SDK. You can download the parts of the Platform SDK from <http://msdn.microsoft.com>. Just go to the Downloads section and follow the directions to download the Platform SDK installation program.

The database server is also Gateway computer with a Pentium 120 processor and 80MB of main memory, running Windows 2000 Server. Obviously, SQL Server 7 and Oracle 8i were installed, plus the Internet Information Server (IIS), Microsoft Message Queues, and COM+ Transaction Server. Just for fun, I also installed Office 2000 and Visual Basic 6 on this machine. The two computers were connected using a 10 MHz Ethernet LAN. The combination was a lot slower than I would have liked, even after I spent a lot of time retuning the system for optimal performance.

Running a database server isn't a trivial task, especially if you want to run it on Windows 2000 Server. Windows 2000 needs a lot of memory in order to have an acceptable level of performance. I recommend a minimum of 256MB of memory for Windows 2000 Server, though you could get by with 128MB of memory if you wanted to run Windows NT 4 Server. If possible, you should have a minimum of a 400MHz Pentium processor, though you could get by with less if your server isn't heavily loaded.

While it's possible to run your database and Visual Basic on one machine, you'll be happier if you can dedicate one machine to SQL Server and use a second for your programming. If you do choose to use a single machine, you should have a lot of memory, especially if you are running Windows 2000 server. You should also try to invest in a dual processor system with relatively fast SCSI disk drives.

## Visit My Web Site

I maintain a Web site at <http://www.JustPC.com> with additional information about the books that my wife and I have written. Each book has its own Web page, on which I answer frequently asked questions and point you to other resources you may find interesting. If you get a chance to stop by, please sign my guest book to let me know you were there.

You're also welcome to send me e-mail at [WFreeze@JustPC.com](mailto:WFreeze@JustPC.com). Let me know what you liked about the book and what you didn't. I've made friends with readers from all over the world by doing this. However, please understand that I make my living from writing, so asking me to be your unpaid consultant isn't fair to you or me. I know what it is like to have a critical project and not be able to get the answers I need in a hurry. If I can help, I will. However, my priorities are my family, my current book (though my editors may think it should have a higher priority), my readers, my Web site, and then everyone else. So don't be surprised if you send me a note, and a few weeks (or even months) later you hear from me. Writing a book such as this one takes a considerable amount of time, and many things, like sleeping, eating somewhere other than my desk, and answering e-mail, are often put off until after the book is finished.

Now don't be afraid to send me e-mail. I enjoy reading every note I get and I do read every single note. I've always enjoyed teaching people how to do things, and writing a book allows me to teach more people than I've ever had the opportunity to do before. Unfortunately, I miss the feedback that you get from teaching someone in person. E-mail is my link to you. So while I can't meet everyone in person, hearing from you via e-mail is the next best thing.



# Acknowledgments

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Sometimes, being a writer can be the pits. The hours are long, the editors are demanding, and you never seem to have time for your family and friends. Everyone believes that you work a few hours each morning if you feel like it, and then have the rest of the day to play. What a laugh! As I write this, my children have been asleep for about eight hours, and they'll be getting up shortly to leave for school. My wife has been asleep for a few hours now, and the only one awake, beside myself, is my cat Pixel, who has walked across my keyboard three times while I've tried to write this paragraph. I wish she would go to sleep, too. On the other hand, writing is sometimes its own reward. I enjoy solving problems and teaching others how to do things. Writing allows me to do both, without the day-to-day headaches that arise as a manager in a large computer center.

So while the rest of the world believes that writing is only a part-time job, I'd like to acknowledge a few other people who believe otherwise.

My agent, Laura Belt, really earns her commissions. She does her best to ensure that I have money for the things that most writers don't have, like electricity to run my computer and a roof over my head. Now if I could only afford something to eat.

My acquisitions editor, John Osborn, challenged me to do this project with an impossibly tight schedule, and in a weak moment, I agreed. However, before I had a chance to really get started on this book, he left for greener pastures. I'm now working with Greg Croy, who has been keeping me both challenged and busy.

Shaun, Elwyn, Rick, Ariane, Dr. Bob, Veronica, Scott, Randy, Vikki, Bob K., and Ian, are but a few of my friends that I haven't seen in months. I promise to call real soon. Really. Okay, maybe after I finish the next book. That is, except for Rick. I may need to stop by and pick your brain and your closet.

Bucky and Goose, my wife's parents. I don't think I could ask for a better set of in-laws. See y'all in a couple of days for the big party.

I want to thank my mom and dad for their support, even though they think I need a haircut. It seems like I never get to see my mother and father as often as I wish. I hope that changes in the future, since they are both very special people to me.

If you read this book carefully, you will find occasional references to Christopher, Samantha, and Jill. Chris, who is six, knows more about computers than some well-paid people I used to work with and has beta tested more software on his computer than most adults I know. While Samantha is only five, she already wants her own laptop computer so she can write books like her mommy and daddy.

My lovely wife, Jill, is a very respected writer and beta tester in her own right, having written books on Microsoft Office, Internet Explorer, and Windows. Jill, if you believe in yourself, anything is possible! I love you!



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