

At Last, a Decent MFC Book!

NEW 5 SDK Annotations!

Windows[®]

August 1996

DEVELOPER'S JOURNAL

The Magazine for Windows Programmers

Software Tools

A More Accurate Timing Tool
A Palette Spy Tool

**Compiler Benchmark: Inlining
Building Win32 DLLs the Right Way**

Bug++ of the Month

*The Missing
Warning Message*

Tech Tips

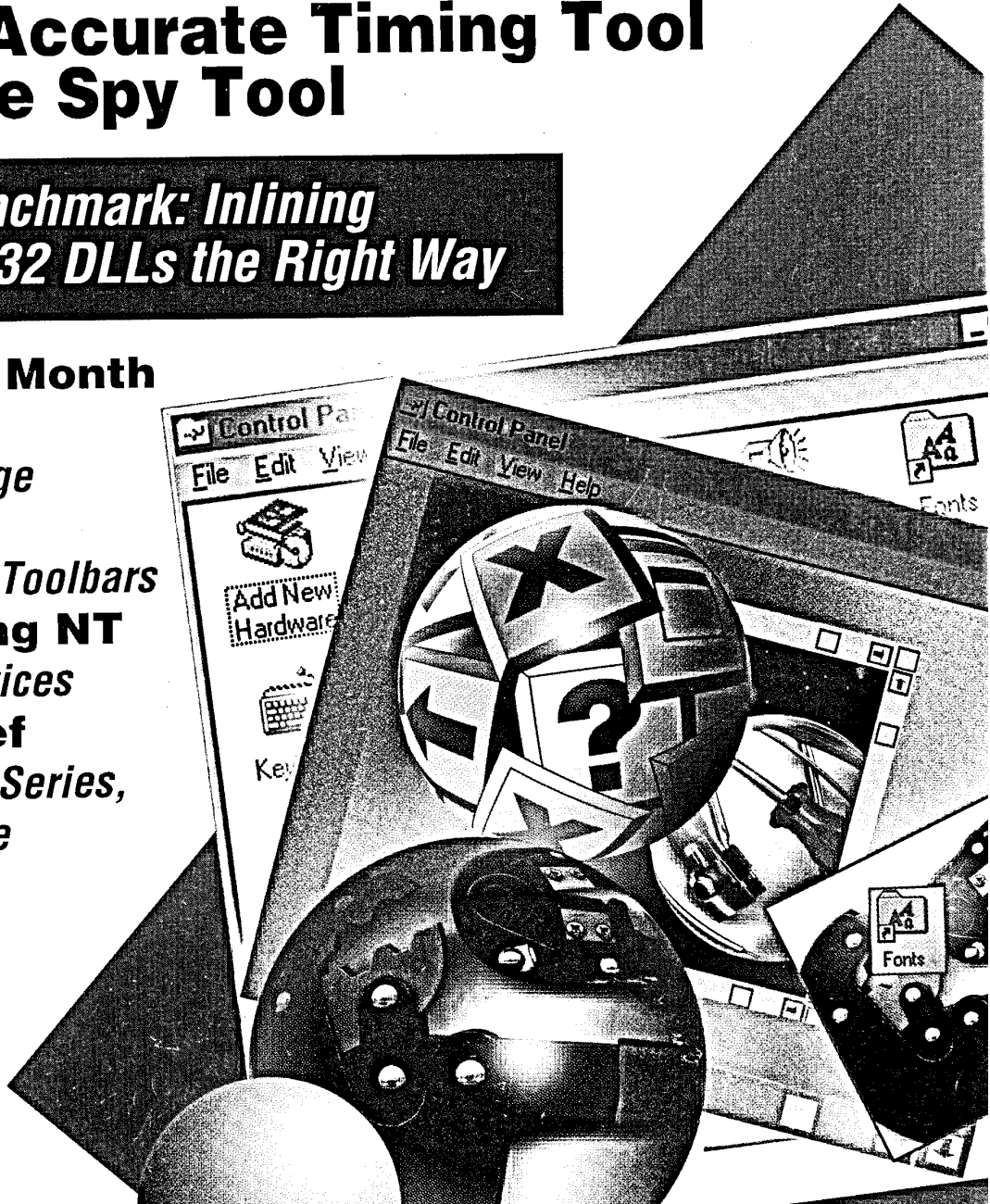
Comboboxes in Toolbars

Understanding NT

Debugging Services

Books in Brief

*The MindShare Series,
Delphi and more*



Volume 7, Number 8

\$4.95 U.S. Canada \$5.95



A Miller Freeman Publication

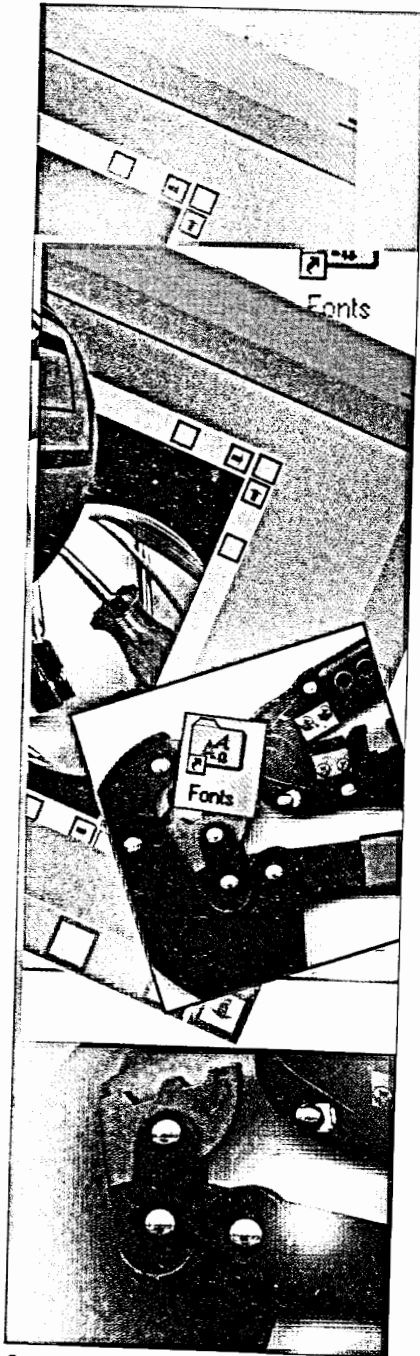
**DOCKET
ALARM**

Find authenticated court documents without watermarks at docketalarm.com.

Windows[®]

DEVELOPER'S JOURNAL

The Magazine for Windows Programmers



Cover image by Twyla Watson Bogaard.

Features

A Palette Spy Utility6

Using an identity palette is essential for fast graphics, but how can you be sure you got it right? This tool uses some undocumented techniques to give you the information you need.

Chris Branch

A More Accurate Timing Tool14

The only way to squeeze those extra cycles out of the CPU is to make changes and measure the results. Abrash's "Zen timer" has often been used for that purpose, but how accurate is it? Here's a look at some problems this kind of timer has and how to improve it.

Mike Dawdy

Compiler Benchmark: C++ Inlining27

How much overhead do you pay for using C++ instead of just C? We start looking for some answers to that question by benchmarking how efficiently five 32-bit Windows compilers can handle a simple inline function.

Ron Burk

Building Win32 DLLs the Right Way33

Richter's Advanced Windows shows you how to build general-purpose Win32 DLLs, right? Wrong — you end up with DLLs that can only be conveniently called by applications compiled with Visual C++. Here's the right way to write code and build your DLL so it can be compiled with Microsoft or Borland, and easily called by any Win32 programming tool.

Ron Burk

Columns

Tech Tips45

Gorkhmaz E. Mikailov shows how to create a combobox or other control in an MFC toolbar. Trevor Harmon provides an MFC class for DIB sections. Simon Fan revisits the spawn and wait problem.

Leor Zolman

Understanding NT: Debugging Services55

Services don't have to be started by the Service Control Manager, so how can your debugger get control? How can you protect yourself against a service that locks up your system at boot time? What debuggers are available for debugging services? The answers are all here, along with the undocumented method for attaching a process with the Visual C++ debugger.

Paula Tomlinson

Windows Developer's Journal (ISSN 1083-9887) is published monthly by Miller Freeman, Inc., 600 Harrison St., San Francisco, CA 94107 USA. (415) 905-2200. Periodicals paid at San Francisco, CA and additional mailing offices. POSTMASTER: Send address changes to Windows Developer's Journal, P.O. Box 56565, Boulder, CO 80322-6565 USA. Subscriptions: Annual renewable subscriptions to Windows Developer's Journal are \$34.99 US, \$45 Canada and Mexico, \$64 elsewhere. Payments must be made in US dollars. Make checks payable to Windows Developer's Journal. GST (Canada): #129065819

Books in Brief61

Paula Tomlinson reviews the System Architecture series of books by MindShare. Also, The Revolutionary Guide to MFC 4 Programming with Visual C++, by Mike Blaszcak; Teach Yourself Delphi 2 in 21 Days, by Dan Osier, Steve Grobman, and Steve Batson (reviewed by George Tylutki).

Ron Burk

Bug++ of the Month67

If you use the delete operator, the compiler has to generate code to call the destructor for that object. But what if the compiler doesn't yet know whether or not you defined a destructor? Isn't it a bug if it doesn't warn you that it may be generating incorrect code? Yes and no, as this month's non-bug shows.

Mark Nelson

SDK Annotations

Annotation #128 — GetDialogBaseUnits58
 Annotation #129 — GetShortPathName60
 Annotation #130 — CCheckBoxListBox::Create62
 Annotation #131 — TBBUTTON68
 Annotation #132 — EM_POSFROMCHAR69

Departments

From the Editor4
 Advertiser Index48
 Call for Papers51
 New Products70
 Readers' Forum74
 Developer's Marketplace75

Next Month Thread Scheduling in Win95 and NT

Drop in on our Web site! You'll find us at:
<http://www.wdj.com>
 You'll find information and excerpts from the current issue, along with links to WDJ code, including our SDK Annotations.
 Check it out — and let us know what you think.

Online Source Code

Except where copyright is explicitly asserted, all code published in Windows Developer's Journal may be freely used and distributed in personal and commercial applications.
 You can obtain source code for *Windows Developer's Journal*, including unpublished code and the latest compilation of our SDK Annotations, from:
CompuServe — GO SDFORUM, Library 7.
GEnie — in the Windows Roundtable at page 1335 (Keyword:Windows).
FTP site: ftp.mfi.com in pub/windev
BBSs:
 Phoenix Chapter ACM Library — (602) 821-1162;
 The Courts of Chaos — (501) 985-0059;
 EmmaSoft Shareware Board — (607) 533-7072;
 C_BBS (The Netherlands), +31-(0)-4930-20361 or +31-(0)-4930-20792.
Code Disk:
 Code disks are available per issue (\$5). Contact Miller Freeman, Inc., Customer Relations, 1-800-444-4881; (913) 838-7500; fax (913) 841-2624; or, via e-mail, wdsu@mf.com.

**Windows
DEVELOPER'S JOURNAL**
The Magazine for Windows Programmers

EDITORIAL

Senior Editor Ron Burk
 Managing Editor Ann Bröcker
 Contributing Editors Paula Tomlinson
 Victor R. Volkman
 Leor Zolman
 Mark Nelson
 V. Ramachandran

Send reader mail to: wletter@mfi.com.

PUBLISHER

Publishing Director Peter Hutchinson
 Associate Publisher Martha Masinton

ADVERTISING AND MARKETING

Director of Sales and Marketing Bill Uhler
 Acct. Manager, East Ed Day
 (913) 838-7547
eday@mfi.com
 Acct. Manager, Midwest Christine Woodley
 (913) 838-7546
cwoodley@mfi.com
 Acct. Manager, West Julie Thornton
 (913) 838-7541
jthornto@mfi.com
 European Advertising Representative Duevelsbeker Weg 4
 24105 Kiel
 Germany
 +49 431-801740
 +49 431-801797
 FAX: 100332.1704
 Email: @compuserve.com
 Sales Support Manager Joni Hernly
 Circulation Manager Cherilyn Olmsted

PRODUCTION

Graphic Artist Twyla Watson Bogaard
 Production Editors Amy Pettie
 Lori White
 Ad Materials Lori White



Subscriptions: Annual renewable subscriptions to *Windows Developer's Journal* are \$34.99 US, \$45 Canada and Mexico, \$64 elsewhere. Payments must be made in US dollars. Make checks payable to *Windows Developer's Journal*.

Entire contents Copyright © 1996 Miller Freeman, Inc., except where otherwise noted. No portion of this publication may be reproduced, stored, or transmitted in any form, including computer retrieval, without written permission from the publisher. All Rights Reserved. Quantity reprints of selected articles may be ordered. By-lined articles express the opinion of the author and are not necessarily the opinion of the publisher. **Printed in the United States of America.**

Advertising: For rate cards or other information on placing advertising in *Windows Developer's Journal*, contact the advertising department at (913) 841-1631, or write *Windows Developer's Journal*, 1601 W. 23rd St., Suite 200, Lawrence, KS 66046-2700 USA.

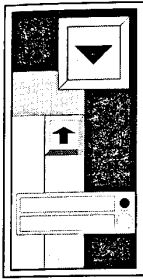
Customer Service: For subscription orders and address changes, contact *Windows Developer's Journal*, P.O. Box 56565, Boulder, CO 80322-6565 USA. Telephone: 1-800-365-1425 or (303) 678-0439; fax (303) 661-1885; email wdsu@mfi.com.

For information about back issues and article reprints, call 1-800-444-4881 or 913-841-1631.

MILLER FREEMAN, INC.

Chairman/CEO Marshall W. Freeman
 President/COO Thomas L. Kemp
 Senior Vice President, CFO Warren "Andy" Ambrose
 Senior Vice President Darrell Denny
 Senior Vice President David Nussbaum
 Senior Vice President Donald A. Pazour
 Senior Vice President Wini D. Ragus
 Vice President/Software Regina Starr Ridley
 Vice President/Production Andrew A. Mickus
 Vice President/Circulation Jerry Okabe





Books in Brief

First Impressions of Recent Titles

Ron Burk

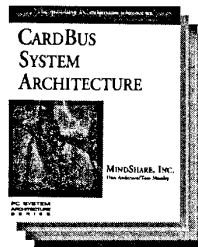
ISA System Architecture, 3rd Ed.
Tom Shanley and Don Anderson
517 pages
MindShare, Inc. and Addison-Wesley, 1995
\$34.95
ISBN 0-201-40996-8

80486 System Architecture, 3rd Ed.
Tom Shanley
188 pages
MindShare, Inc. and Addison-Wesley, 1995
\$19.95
ISBN 0-201-40994-1

PCI System Architecture, 3rd Ed.
Tom Shanley and Don Anderson
557 pages
MindShare, Inc. and Addison-Wesley, 1995
\$34.95
ISBN 0-201-40993-3

EISA System Architecture, 2nd Ed.
Tom Shanley and Don Anderson
207 pages
MindShare, Inc. and Addison-Wesley, 1995
\$24.95
ISBN 0-201-40995-X

Pentium Processor System Architecture, 2nd Ed.
Tom Shanley and Don Anderson
433 pages
MindShare, Inc. and Addison-Wesley, 1995
\$29.95
ISBN 0-201-40992-5



PCMCIA System Architecture, 2nd Ed.
Don Anderson
440 pages
MindShare, Inc. and Addison-Wesley, 1995
\$29.95
ISBN 0-201-40991-7

PowerPC System Architecture
Tom Shanley
609 pages
MindShare, Inc. and Addison-Wesley, 1995
\$34.95
ISBN 0-201-40990-9

Plug and Play System Architecture
Tom Shanley
327 pages
MindShare, Inc. and Addison-Wesley, 1995
\$29.95
ISBN 0-201-41013-3

CardBus System Architecture
Don Anderson and Tom Shanley
407 pages
MindShare, Inc. and Addison-Wesley, 1996
\$29.95
ISBN 0-201-40997-6

Protected Mode Software Architecture
Tom Shanley
310 pages
MindShare, Inc. and Addison-Wesley, 1996
\$29.95
ISBN 0-201-40996-8

Got an opinion about these or other programming books? Send them to 70302.2566@compuserve.com. You can order any of the books that appear in Books in Brief from Miller Freeman, Inc. by calling (913) 841-1631, faxing (913) 841-2624, or sending email to rdorders@rdpub.com. If using fax or email, send the book title, author, and publisher along with your MasterCard or Visa number, expiration date, and phone number.

To submit books for review, send them to: Ron Burk, 13846 NE 60th Way, #120, Redmond, WA 98052-4542. Please do not send press releases to this address.

August 1996

Windows Developer's Journal — Page 61

[Editor's note: this review was provided by Paula Tomlinson.] I first discovered the System Architecture series a couple years ago at the bookstand that Computer Literacy always runs during the Software Development conferences. At that time, these books were published directly by MindShare and had very generic and nondescript black-and-white covers, so I almost overlooked them. I spotted the ISA and EISA books first. After leafing through them that night, I ran back to the bookstand the following day to buy any other books in the series, not dissuaded in the least by the prospect of hauling them back home with me. *CardBus System Architecture* is just the latest in this PC Architecture Series that currently totals 10 books. Addison-Wesley is now publishing these books with MindShare, so the more colorful cover art and wider distribution should ensure that you will be able to find them at any bookstore with a reasonable stock of computer titles.

I admit that there are so few good hardware books available that I tend to get enthusiastic about even mediocre attempts. But this series of books is truly an important part of my library. The series is generally based around processor architectures and bus architectures (with a few miscellaneous topics such as Plug-and-Play). I find that most books that call themselves processor architecture books are really references for the assembly language instruction set of that particular processor. While those books fill a need, they don't give readers an understanding of the overall hard-

ware design and are not adequate references for device driver writers. This is especially true of bus architectures; for example, it is extremely difficult to find good technical information about the PCI or PCMCIA buses. When I do manage to find an occasional hardware reference on the bookshelf, I almost hesitate to pick it up for fear of seeing the inevitable \$89+ price tag. As a welcome relief, the MindShare series titles range from \$19.95 to \$34.95. At this price, I don't feel bad spending the money on a book I might use only as an occasional reference. Ironically, though, my office copy of *EISA System Architecture* currently holds the title of "most likely to be borrowed by a coworker."

The format of these books is quite different than that of the average computer book. Each book is based on a seminar taught by the author and that heritage is evident in the book's structure — it flows more like modules than chapters. Like most hardware books, they get right to the point; there are none of the self-indulgent authorial digressions that you see in some software development books. But, unlike most hardware books, these are actually readable. Most hardware references read like encyclopedias — even the publishers don't expect anyone to actually read the

WINGRAF 2.0 (for MS Windows)	INGRAF 7.0 (for DOS/DOS Extenders)
WINGRAF & INGRAF are Graphics libraries for Scientific, Engineering and Business applications. Each library contains over 150 routines. C, FORTRAN, BASIC and PASCAL versions. FULL SOURCE CODE NO ROYALTIES	
Sutrasoft P.O. Box 1733 Sugar Land, TX 77787-1733 Tel: (713) 491-2088 Fax: (713) 240-6883 76163.1164@compuserve.com	

Request Reader Service #147

SDK Annotation #130

TYPE: MFC
TOPIC: CCheckBox::Create
KEYWORD: CCheckBox::Create

The documentation mentions that the `dwStyle` parameter could be any of the specified listbox styles. However, the `dwStyle` parameter should NOT be `LBS_MULTICOLUMN` or `LBS_USETABSTOPS`. Moreover, you need to specify `LBS_OWNERDRAWFIXED` and `LBS_HASSTRINGS`. You can specify `LBS_OWNERDRAWVARIABLE` instead of `LBS_OWNERDRAWFIXED`, but then you need to override `CCheckListBox::DrawItem`, otherwise the debug version will ASSERT.

Submitted by Sudhir Menon.

Get the entire set of annotations from www.wdj.com or CompuServe (file `sd kann.zip` in section 7 "R&D Publications" of forum `SDFORUM`). Contribute your own annotations via email to 70302.2566@compuserve.com (indicate which topic in which help file you are annotating).

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.