

R A Y D U N C A N

D V A N C E D

# MS DOS<sup>®</sup>

MICROSOFT  
P R E S S

The  
Microsoft<sup>®</sup>  
guide for  
Assembly  
Language  
and C  
programmers.

Physics  
QA  
73  
.112  
.Q63D858  
1986

PUBLISHED BY  
Microsoft Press  
A Division of Microsoft Corporation  
16011 N.E. 36th Way, Box 97017, Redmond, Washington 98073-9717

Copyright © 1986 by Ray Duncan  
All rights reserved. No part of the contents of this book may  
be reproduced or transmitted in any form or by any means without  
the written permission of the publisher.

Library of Congress Cataloging in Publication Data  
Duncan, Ray  
Advanced MS-DOS  
Includes index.  
1. MS-DOS (Computer operating system) 2. Assembler language  
(Computer program language) 3. C (Computer program language)  
I. Title.

QA76.76.Q63D858 1986 005.4'46 86-8496  
ISBN 0-914845-77-2

Printed and bound in the United States of America.  
3 4 5 6 7 8 9 F G F G 8 9 0 9 8 7 6

Distributed to the book trade in the United States by Harper & Row.  
Distributed to the book trade in Canada by General Publishing Co., Ltd.  
Distributed to the book trade outside the United States of America  
and Canada by Penguin Books Ltd.

Penguin Books Ltd., Harmondsworth, Middlesex, England  
Penguin Books Australia Ltd., Ringwood, Victoria, Australia  
Penguin Books N.Z. Ltd., 182-190 Wairau Road, Auckland 10,  
New Zealand

British Cataloging in Publication Data available

UNIX™ is a trademark of AT&T Bell Laboratories.  
Compaq® is a registered trademark of COMPAQ Computer Corporation.  
Periscope™ is a trademark of Data Base Decisions.  
PIM-IV® is a registered trademark of Digital Equipment Corporation.  
Concurrent DOS®, CP/M-80®, CP/M-86®, and Digital Research® are registered trademarks  
of Digital Research, Incorporated.  
HP™ is a trademark of Hewlett-Packard.  
Intel® is a registered trademark and iRMX-86™ is a trademark of Intel Corporation.  
IBM® is a registered trademark, and PC/AT™, PC-DOS™, PC/XT™, and TopView™ are  
trademarks of International Business Machines Corporation.  
PC/FORTH is a trademark of Laboratory Microsystems Incorporated.  
Volkswriter® is a registered trademark of Lifetree Software, Incorporated.  
Lotus® is a registered trademark of Lotus Development Corporation.  
WordStar® is a registered trademark of MicroPro International Corporation.  
Microsoft®, MS-DOS®, and XENIX® are registered trademarks of Microsoft Corporation.  
Advanced Trace-86™, Disk Toolkit™, and Trace-86™ are trademarks of Morgan Computing  
Company, Incorporated.  
Motorola® 6845 is a registered trademark of Motorola, Incorporated.  
Norton Utilities™ is a trademark of Peter Norton, Incorporated.  
TeleVideo® 950 is a registered trademark of TeleVideo Systems, Incorporated.

## Int 21H (33) General

Most of the MS-DOS operating-system services are invoked through software interrupt 21H. Using these services, a program can inspect disk directories, make or delete files, read or write records within files, set or read the real-time clock, and perform many other functions in a hardware-independent manner.

The MS-DOS functions available through Int 21H are well standardized and available on any MS-DOS system. Programs that perform all I/O through these functions will run on any machine that supports MS-DOS.

**Calling sequence:** MS-DOS services can be invoked in several different ways:

- Load the AH register with the function number and other registers with the call-specific parameters, then execute an Int 21H. This is the recommended method and produces the cleanest, most compact object code.

```

mov  ah,function_number
.
.
.
int  21h

```

- **2 3** Load the AH register with the function number and other registers with the call-specific parameters, then execute a long call to offset 00000H in the program segment prefix. This linkage is available only with MS-DOS version 2.0 and above.
- Load the CL register with the function number and other registers with the call-specific parameters, then execute an intrasegment call to offset 00000H in the PSP, which contains a long call to the MS-DOS function dispatcher. This method is valid only for function calls 00H through 24H. Register CL is always destroyed if this method is used; otherwise, the results are the same as for the first two methods discussed above. The precursor to MS-DOS, MS-86-DOS originally sold by Seattle Computer Products (see Chapter 2), included this linkage mechanism to facilitate easy conversion of CP/M programs, and its use should now be avoided.

The contents of all registers are preserved across MS-DOS calls, except for those registers used to return results. The only exceptions are function 63H, which was added in MS-DOS version 2.25 to support extended character sets, and function 4BH (EXEC).

For those functions that are comparable to CP/M functions (00H through 24H), success codes are typically returned in register AL. For those functions that were added in MS-DOS version 2.0 and above, the carry flag is cleared to indicate success or set to indicate failure, and in the latter case a more specific error code is also returned in register AX.

## Int 21H (33) Function summary

Hex	Dec
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0A	10
0B	11
0C	12
0D	13
0E	14
0F	15
10	16
11	17
12	18
13	19
14	20
15	21
16	22
17	23

\*Key to input tyg  
A = ASCIIZ string  
D = drive number  
F = file control block  
H = handle