RAY DUNCAN

DVANCED MSDOS®

The Microsoft® guide for Assembly Language and C programmers.

MICROSOFT PRESS

Physics
QA
76
.76
.063D858
1986

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

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.
QA76.76.063D858 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 FGFG 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

- The upper left corner of a heading gives the interrupt and fu[illegible] in hexadecimal and decimal, and the upper right corner indicates [illegible] sions of MS-DOS support the function (the filled icon means [illegible] does support the function; the open icon means that it does not). [illegible] lowed by the body of the entry, which includes . . .
- The name of the function;
- A clear English description of the function's purpose;
- The input parameters to the function;
- The values or status codes returned by the function;
- Notes giving information or warnings about the function;
- An example invoking the function in assembly language.

Comparisons to CP/M and UNIX are included where appropriate.

For purposes of clarity, the examples may include code that would not always be [illegible] application (such as code that explicitly sets the segment registers before each call to MS-[illegible] these are frequently initialized at the first entrance to a program and then left unchanged. [illegible] please keep in mind that error codes may differ, depending upon the version of MS-DOS [illegible] are using.

One of several method
system that the progra
MS-DOS then takes the
- R
- R
- F
- Tr

If the program is return
ident portion and the t
ceives control. If a batch
otherwise, a prompt is i

Call with: CS

Returns: Nothing

Notes:
- Any f closed
- 2 3 T progra Howe Int 21H with r
- This fu a progr the EX progra

Example: Perform a fin

dual functions available through
ng standard format:
nterrupt and function number
ight corner indicates which
lled icon means that the version
ns that it does not). The
es . . .

urpose;

nction;
the function;
y language.

not always be necessary
efore each call to MS-DOS
d then left unchanged.
he version of MS-DOS

Int 20H (32)
Program terminate

1 2 3

One of several methods that a program can use to perform a final exit. Informs the operating system that the program is completely finished and that the memory it occupied can be released. MS-DOS then takes the following actions:

- Restores the termination handler vector from PSP:000AH.
- Restores the Ctrl-C vector from PSP:000EH.
- 2 3 Restores the critical error handler vector from PSP:0012H.
- Flushes the file buffers.
- Transfers to the termination handler address.

If the program is returning to COMMAND.COM, control transfers to COMMAND.COM's resident portion and the transient portion of COMMAND.COM is reloaded (if necessary) and receives control. If a batch file is in progress, the next line of the file is fetched and interpreted; otherwise, a prompt is issued for the next user command.

Call with:	CS	= segment address of program segment prefix (thus, cannot be used from an EXE file)

Returns: Nothing

Notes:

- Any files that have been written to by the program using FCBs should be closed before performing this exit call; otherwise, data may be lost.
- 2 3 This is the traditional way to exit from an application program, for those programmers who have been with MS-DOS since its earliest incarnations. However, under versions 2 and 3, the preferred method of termination is via Int 21H function 31H (terminate and stay resident) or function 4CH (terminate with return code).
- This function is equivalent to the CP/M BDOS function 00H. However, when a program exits under MS-DOS version 2.0 or above, control may return via the EXEC call (function 4BH) to a parent program that "spawned" the exiting program, rather than to the operating system.

Example: Perform a final exit.

```
        int     20h                     ;transfer to DOS.
```

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 wri[illegible] 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 ma- chine 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 [illegible] call-specific parameters, then execute an Int 21H. This is the recomm[illegible] method and produces the cleanest, most compact object code.

```
mov     ah,function_number
.
.
.
int     21h
```

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

The contents of all registers are preserved across MS-DOS calls, except for those regist[illegible] used to return results. The only exceptions are function 63H, which was added in MS-D[illegible] sion 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 [illegible] codes are typically returned in register AL. For those functions that were added in MS-D[illegible] sion 2.0 and above, the carry flag is cleared to indicate success or set to indicate failure, [illegible] latter case a more specific error code is also returned in register AX.

Int 21H (33)
Function summ

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 typ
A = ASCIIZ strin
D = drive number
F = file control bl
H = handle

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.

WHAT WILL YOU BUILD? | **sales@docketalarm.com** | **1-866-77-FASTCASE**

fastcase® Smarter legal research.