

DEC-11-UDKIA-A-D

DOS/BATCH
Disk Initialization Program
(DSKINT)
Programmer's Manual

FOR THE DOS/BATCH OPERATING SYSTEM

Version V09

August 1973

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PREFACE

The DOS/BATCH Disk Initializer (DSKINT) initializes and records bad blocks for an RP03 disk. This document describes the DSKINT program. Chapter 1 is an introduction, describing the functions and features of DSKINT. Chapter 2 describes the commands used when running DSKINT, and the functions performed by these commands. Some sample executions of the DSKINT program are also supplied in Chapter 2. Chapter 3 describes error messages that can be issued by the DSKINT program.

DOCUMENTATION CONVENTIONS

The following notation conventions are used throughout this document:

1. In all keyboard output examples, Monitor typeouts and program typeouts are underlined; user typeins are not underlined.
2. In input and output examples, upper-case letters denote information to be entered or displayed exactly as shown; lower-case letters denote variables supplied by the user (on input) or the system (on output).
3. Brackets [] enclose optional material. The sole exception to this convention is the User Identification Code (UIC), which must always be enclosed in brackets when entered at the keyboard; e.g., [200,200].
4. Braces { } are used to enclose information from which a choice must be made.
5. The ↵ symbol denotes use of the CARRIAGE RETURN key.

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CHAPTER 1
INTRODUCTION

DSKINT is a DOS/BATCH system program that performs the following functions on a specified RP03 disk:

1. Zeroing -- writing zeros to one or more parts of the disk surface.
2. Verification -- writing a test pattern to the disk, then reading the disk to verify that the pattern was written correctly. The procedure is then repeated with a second test pattern. The two test patterns used are "worse-case" patterns as used in diagnostics.
3. Bad Block Identification -- creating a bad block file (BADB.SYS) on the disk's [1,1] user area. This file contains the addresses of bad blocks encountered during the current initialization and/or past initializations of the disk. The file BADB.SYS can be updated with operator-entered bad block addresses.
4. Initialization -- verifying and zeroing disk blocks 0 and 1, then zeroing the remainder of the disk. In addition, initialization entails writing file directories, bit maps, and BADB.SYS on the disk, and entering [1,1] and the current user UIC into the Master File Directory (MFD).

DSKINT supports only RP03 disks with a standard DOS/BATCH file structure. Either DSKINT or SYSLOD must be used to initialize an RP03 disk that has not previously been written upon.

Note: SYSLOD should be used to format a system disk pack.

CHAPTER 2

DSKINT COMMANDS AND FUNCTIONS

The DSKINT program is requested through the \$RUN command. After it has been loaded, DSKINT identifies itself and prints a # character at the keyboard to indicate readiness to accept commands. This sequence is illustrated below.

```
$RUN DSKINT )  
DSKINT Vxxx          (xxx is the current DSKINT version)  
#
```

The operator must then respond to the # character with a command in the following format:

```
dev:[/sw.../sw] )
```

where: dev = the mnemonic specifying the disk to be initialized
(for example DP, DP2, etc.)
sw = a switch name that specifies the type of initialization
to be performed (described later in this chapter)

If no switch is specified in this first command, a default of /Z is assumed (see Section 2.1.1.1).

2.1 DSKINT COMMAND SWITCHES

DSKINT can be run in either of two modes: Normal mode or Mark mode. In Normal mode, initialization (verifying and zeroing processes) is performed; in Mark mode, bad block identification (through the BADB.SYS file) is performed.

2.1.1 Normal Mode Command Switches

The following switches can be used in Normal mode (the initial situation when running DSKINT):

/Z Zero
/V Verify
/R Retain
/L List
/M Enter Mark Mode

2.1.1.1 /Z Switch

The /Z (Zero) switch instructs DSKINT to perform basic initialization of the specified disk, which entails the following:

1. Verify blocks 0 and 1 of the disk; verify any other disk blocks reserved for the DOS/BATCH file structure.
2. Zero the entire disk.
3. Write file directories, bit maps, and BADB.SYS onto the disk.
4. Enter [1,1] and the current UIC into the MFD.

An example of the use of the /Z switch is shown below.

```
#DP3:/Z )
```

This command requests that basic initialization be performed on an RP03 disk on drive 3.

2.1.1.2 /V Switch

The /V (Verify) switch instructs DSKINT to verify and zero an entire disk. An example of the use of the /V switch is shown below.

```
#DP:/V )
```

This command requests that verification and zeroing be performed on an RP03 disk on drive 0.

2.1.1.3 /R Switch

The /R (Retain) switch instructs DSKINT to retain the file BADB.SYS on a disk that has previously been initialized, and to include information from that file into the new BADB.SYS file when initializing the disk. The /R switch is used in conjunction with the /Z or /V switch; it has no effect when used for a disk that has not previously been initialized. An example of the use of the /R switch is shown below.

```
#DP2:/V/R)
```

This command requests that verification and zeroing be performed on an RP03 disk on drive 2, and that the old BADB.SYS file be retained and included in the new BADB.SYS file.

2.1.1.4 /L Switch

The /L (List) switch instructs DSKINT to list the contents of the BADB.SYS file at the printer for the specified disk. If BADB.SYS is empty (i.e., if there are no bad blocks on the disk), DSKINT prints the following message at the printer:

```
NO BAD BLOCKS ON THIS DISK
```

If there are one or more bad blocks on the disk, DSKINT lists the contents of BADB.SYS at the printer as shown below:

BADB.SYS			
BLOCK	CYLINDER	TRACK	SECTOR
bbbbbb	cccccc	tttttt	ssssss
.	.	.	.
.	.	.	.
.	.	.	.
END OF FILE BADB.SYS			

where: bbbbbb = the block address of the bad block
cccccc = the cylinder containing the bad block
tttttt = the track containing the bad block
ssssss = the sector containing the bad block

An example of the use of the /L command is shown below.

```
#DP0:/L )
```

This command requests that the contents of BADB.SYS on an RP03 disk on drive 0 be listed on the printer.

2.1.1.5 /M Switch

The /M (Enter Mark Mode) switch instructs DSKINT to enter Mark mode. In Mark mode, the operator can enter or delete bad block addresses for BADB.SYS (by block address or by cylinder: track:sector address). Listings of BADB.SYS can also be obtained at the printer while in Mark mode. An example of the use of the /M switch is shown below.

```
#DP1:/M )  
*  
_
```

This command requests that DSKINT enter Mark mode during the initialization of an RP03 disk on drive 1. DSKINT indicates that Mark mode has been entered by printing an asterisk (*) at the keyboard.

2.1.2 Mark Mode Command Switches

The operator causes DSKINT to enter Mark mode by using the /M switch in Normal mode as described previously. DSKINT indicates that it is operating in Mark mode by printing an asterisk (*) at the beginning of a keyboard line. When in Mark mode, the operator can specify the following switches:

```
/M Mark  
/U Unmark  
/L List  
/D Done
```

2.1.2.1 /M Switch

The /Mark (Mark) switch instructs DSKINT to enter a specified address into the BADB.SYS file. The /M switch can be specified in either of two formats, shown below:

Format 1: *bbbbbb[/M])

where bbbbb is an octal Block address

Format 2: *ccc:tt:ss[/M])

where: ccc is an octal cylinder address, tt is an octal track address, ss is an octal sector address

Note that /M is a default value, even if the switch specification is omitted. Two examples of the use of the /M switch are provided below.

Example 1: *43)

This command instructs DSKINT to enter block 43 (octal) into the BADB.SYS file of the disk being initialized.

Example 2: *43:32:3/M)

This command instructs DSKINT to enter the address specified (cylinder 43, track 32, sector 3) into the BADB.SYS file.

2.1.2.2 /U Switch

The /U (Unmark) switch instructs DSKINT to (1) delete a specified address from the BADB.SYS file, or (2) ignore a previously specified /M switch on a keyboard line. The /U switch, like the /M switch, can be specified in either of two formats, shown below.

Format 1: *bbbbbb/U)

where bbbbb is an octal block address

Format 2: *ccc:tt:ss/U)

where ccc is an octal cylinder address, tt is an octal track address, and ss is an octal sector address

Three examples of the use of the /U switch are provided below.

Example 1: *64/U)

This command instructs DSKINT to delete block address 64 (octal) from BADB.SYS.

Example 2: *47:4:2/U)

This command instructs DSKINT to delete the specified address (cylinder 47, track 4, sector 2) from BADB.SYS.

Example 3: *73/M/U)

This command initially instructs DSKINT to enter octal block address 73 into BADB.SYS (/M switch), but then deletes that address (/U switch). When several /M and /U switch specifications appear on the same keyboard line, the last one specified takes precedence. This can be useful if, for example, the operator mistypes an address in a command string.

2.1.2.3 /L Switch

The /L switch performs the same function in Mark mode that it does in Normal mode; i.e., it instructs DSKINT to list the contents of the BADB.SYS file at the printer. See Section 2.1.1.4 for details.

2.1.2.4 /D Switch

The /D (Done) switch instructs DSKINT to exit from Mark mode, and continue initialization of the disk. An example is shown below.

*65/M/D)

This command instructs DSKINT to enter octal block address 65 into BADB.SYS, and then exit from Mark mode to continue initialization of the disk. When initialization has been completed, DSKINT prints the following message at the keyboard

INITIALIZATION COMPLETE

and exits to the Monitor.

2.2 SAMPLE DSKINT EXECUTIONS

Three sample executions of the DSKINT program are provided in the following text. Each sample is described as two columns: the left-hand column illustrates the keyboard dialogue, while the right-hand column explains the meaning of each operator type in or DSKINT type out.

SAMPLE 1:

<u>Dialogue</u>	<u>Explanation</u>
<u>\$</u> RUN DSKINT)	Operator requests DSKINT
<u>DSKINT V001</u>	Version 001 of DSKINT loaded
<u>#DP0:/L</u>)	Listing of BADB.SYS file for disk on drive 0 requested
<u>\$</u>	Listing has been produced at printer; DSKINT exits to Monitor

SAMPLE 2:

<u>Dialogue</u>	<u>Explanation</u>
<u>\$</u> RUN DSKINT)	Operator requests DSKINT
<u>DSKINT V001</u>	Version 001 of DSKINT loaded
<u>#DP0:/V/L</u>)	Operator requests verification of disk on drive 0, followed by listing of BADB.SYS
INITIALIZATION COMPLETE	Verification has been performed; listing has been produced at printer
<u>\$</u>	DSKINT exits to Monitor

SAMPLE 3:

<u>Dialogue</u>	<u>Explanation</u>
<u>\$</u> RUN DSKINT)	Operator requests DSKINT
<u>DSKINT V001</u>	Version 001 of DSKINT loaded
<u>#DP0:/M</u>)	Operator requests basic initialization of disk on drive 0; operator also requests DSKINT to enter Mark Mode to alter BADB.SYS file.

SAMPLE 3 (Cont.)

<u>Dialogue</u>	<u>Explanation</u>
*100)	Enter octal block address 100 into BADB.SYS
*37:23:4)	Enter octal address (cylinder 37, track 23, sector 4) into BADB.SYS
*44)	Enter octal block address 44 into BADB.SYS
*45)	Enter octal block address 45 into BADB.SYS
*43)	Enter octal block address 43 into BADB.SYS
*307:23:11/M/U)	Operator decides not to enter the address (cylinder 307, track 23, sector 11) into BADB.SYS
*44/U/L)	Delete block address 44 from BADB.SYS, then list contents of BADB.SYS at printer (see Figure 2-1 for listing produced)
*22:22:0)	Enter octal address (cylinder 22, track 22, sector 0) into BADB.SYS
*/L)	List contents of BADB.SYS at printer (See Figure 2-2 for listing produced)
*307:23:11)	Enter octal address (cylinder 307, track 23, sector 11) into BADB.SYS
*1:0:0)	Enter octal address (cylinder 1, track 0, sector 0) into BADB.SYS
*2)	Enter octal block address 2 into BADB.SYS
*3)	Enter octal block address 3 into BADB.SYS
*6)	Enter octal block address 6 into BADB.SYS
*7/M/U/M/U/M/L)	Enter octal block address 7 into BADB.SYS (note final inspection of /M switch), then list contents of BADB.SYS at printer (see Figure 2-3 for listing produced)
*33)	Enter octal block address 33 into BADB.SYS
*/L)	List contents of BADB.SYS at printer (see Figure 2-4 for listing produced)

SAMPLE 3 (Cont.)

<u>Dialogue</u>	<u>Explanation</u>
* / D)	Exit from Mark mode, continue initialization
INITIALIZATION COMPLETE	DSKINT has completed basic initialization of the disk
\$	DSKINT exits to Monitor

Figures 2-1, 2-2, 2-3, and 2-4 illustrate listing of the BADB.SYS file, based on the dialogue shown in sample 3.

```

                                BADB.SYS

BLOCK      CYLINDER      TRACK      SECTOR

000043     000000         000007     000000
000043     000000         000007     000001
000045     000000         000007     000004
000045     000000         000007     000005
000100     000000         000014     000010
000100     000000         000014     000011
006175     000037         000023     000004
006175     000037         000023     000005

END OF FILE BADB.SYS

```

Figure 2-1 First Listing Produced in Sample DSKINT Execution (RP03)

```

                                BADB.SYS

BLOCK      CYLINDER      TRACK      SECTOR

000043     000000         000007     000000
000043     000000         000007     000001
000045     000000         000007     000004
000045     000000         000007     000005
000100     000000         000014     000010
000100     000000         000014     000011
003542     000022         000022     000000
003542     000022         000022     000001
006175     000037         000023     000004
006175     000037         000023     000005

END OF FILE BADB.SYS

```

Figure 2-2 Second Listing Produced in Sample DSKINT Execution (RP03)

BADB.SYS

BLOCK	CYLINDER	TRACK	SECTOR
000002	000000	000000	000004
000002	000000	000000	000005
000003	000000	000000	000006
000003	000000	000000	000007
000006	000000	000001	000002
000006	000000	000001	000003
000007	000000	000001	000004
000007	000000	000001	000005
000043	000000	000007	000000
000043	000000	000007	000001
000045	000000	000007	000004
000045	000000	000007	000005
000100	000000	000014	000010
000100	000000	000014	000011
000144	000001	000000	000000
000144	000001	000000	000001
003542	000022	000022	000000
003542	000022	000022	000001
006175	000037	000023	000004
006175	000037	000023	000005
047037	000307	000023	000010
047037	000307	000023	000011

END OF FILE BADB.SYS

Figure 2-3 Third Listing Produced in Sample DSKINT Execution (RP03)

BADB.SYS

BLOCK	CYLINDER	TRACK	SECTOR
000002	000000	000000	000004
000002	000000	000000	000005
000003	000000	000000	000006
000003	000000	000000	000007
000006	000000	000001	000002
000006	000000	000001	000003
000007	000000	000001	000004
000007	000000	000001	000005
000033	000000	000005	000004
000033	000000	000005	000005
000043	000000	000007	000000
000043	000000	000007	000001
000045	000000	000007	000004
000045	000000	000007	000005
000100	000000	000014	000010
000100	000000	000014	000011
000144	000001	000000	000000
000144	000001	000000	000001
003542	000022	000022	000000
003542	000022	000022	000001
006175	000037	000023	000004
006175	000037	000023	000005
047037	000307	000023	000010
047037	000307	000023	000011

END OF FILE BADB.SYS

Figure 2-4 Fourth Listing Produced in Sample DSKINT Execution (RP03)

CHAPTER 3

DSKINT ERROR MESSAGES

Table 3-1 lists the error messages issued at the keyboard by the DSKINT program.

Table 3-1

DSKINT Error Messages

<u>Message</u>	<u>Meaning</u>
INPUT COMMAND STRING ERROR. TRY AGAIN	The operator has entered an input command string incorrectly. The command must be re-entered.
INITIALIZES RP DISKS ONLY. TRY AGAIN	The operator specified a device other than an RP disk in an input command string. The command must be re-entered.
INVALID UNIT NO. TRY AGAIN	The operator specified a unit number greater than 7 for a disk in the input command string.
NOT ENOUGH MEMORY	Not enough memory is available to contain BADB.SYS. No remedial action is possible.
BAD BLOCK ADDRESS OR SWITCH ERROR	Operator error when entering a command string in Mark mode. Possible reasons are (1) invalid switch specified, (2) block address too high, (3) cylinder:track:sector address too high, (4) operator attempted to add block 0 or block 1 to BADB.SYS. These blocks are reserved for the system.

Table 3-1 (Cont.)

DSKINT Error Messages

	<u>Message</u>	<u>Meaning</u>
	CRITICAL ERROR IN MFD OR BIT MAP DISK PACK UNSUITABLE FOR USE UNDER DOS/BATCH	An error has been detected on disk blocks 0 or 1, or verification of the test patterns has failed. The disk being initialized cannot be used under DOS/BATCH. After issuing this message, DSKINT exits to the Monitor without performing further initialization.
S254	0	The operator has issued a command string to DSKINT that would result in the zeroing of the system disk. This is illegal.
A043	bbbbbb	This message is typed each time a bad block is detected during initialization. The address of the bad block is listed (bbbbbb). To continue initialization, the operator types CO) at the keyboard. This message may be issued several times for the same block, as DSKINT retries the block before entering it into BADB.SYS.
F042	eeeeee	This message is issued when the disk controller is unable to perform a successful home seek. Hardware failure or a damaged disk pack is indicated. The contents of the controller error register (eeeeee) are listed. DO NOT ATTEMPT TO USE THE DISK FURTHER UNTIL IT HAS BEEN VERIFIED BY FIELD SERVICE. SAVE THE DSKINT PRINTOUTS AND CHECK THE DISK DRIVE FOR A "FILE UNSAFE" LIGHT.

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