

**PRODUCT SPECIFICATION**

REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
H	8-20-79	<i>J. Dale</i>	<p>Changes for Mark 9.0 Release</p> <p>1-1 Rewrote first paragraph of GENERAL section.</p> <p>2-1 Added "system" to "PACK/INIT does...reader." in OPERATING INSTRUCTIONS.                      Deleted "on the control panel" from OPERATING INSTRUCTIONS.                      Added last sentences "If cylinder zero...user or MCP data)." to CI section.                      Replaced "discontinuation" in second sentence in CI section with "previously aborted cylinder."                      Changed "*" in R or RC, RI, and CI sections to "(See Note 1)".</p> <p>2-2 Deleted "and have...in tact." from "Note 1: These options..." sentence.</p>

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REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
G	6-4-79	<i>J. Hale</i>	<p>Changes for Mark 8.0 Release</p> <p>1-1 Rewrote A 225 paragraph. Replaced "5" with "-" in "207 Pack" in Table 1-1.</p> <p>2-1 Changed number 2. of "CONSOLE PRINTER (SPO)" from "Verification Only..." to "Enter Action:..." and rewrote that section.</p> <p>2-2 Deleted number 3. Renumbered 4 thru 6 to 3 thru 5 under "CONSOLE PRINTER (SPO)". Added number 6. Enter 5 DIGIT JULIAN DATE (YYDD). Under number 7. ENTER OWNER'S NAME changed "If initialization is requested, the user can..." to "The user can enter..." Deleted last line in "REMOVE OPTION" Deleted last line in "LIMIT SPECIFIER OPTION" Added "(I, RI, or CI only)" to "MARGINAL SECTORS OPTION" title and updated that section.</p> <p>2-3 Added "(I, RI, or CI)" after "The Initialization-pattern..." in second paragraph of "DOLLAR SIGN OPTIONS." Changed "early strobe" to "plus threshold" and "late strobe" to "minus threshold" in third paragraph of DOLLAR SIGN OPTIONS. Added number 9. ENTER CYLINDER.</p> <p>2-4 Revised "CARD READER" section. Deleted last line in "REMOVE OPTION CARD"</p> <p>2-5 Deleted last line in "LIMIT SPECIFIER CARD" Added "(I, RI, or CI only)" to "MARGINAL SECTOR CARD" title. Added "CYLINDER CARD..." section after "DOLLAR SIGN CARD"</p> <p>2-6 Revised "207 disk" in "DEFAULT INITIALIZE/VERIFY PROCEDURES"</p> <p>3-1 Changed "SAMPLE STRINGS" numbers 1-4. Under 1.: "MSG: VERIFICATION ONLY ..." changed to "ENTER ACTION: ..." "RSP:" from "NO" to "I" "RSP:" from "76150" to "79150" Date in card reader input changed from</p>

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GENERAL MANAGER  
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REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
			<p>Changes for Mark 8.0 Release (Cont)</p> <p>"U 76150 John Doe" to "U 79150 John Doe"                      "Julian date = 76150" to "79150"                      Under 2.:                      "MSG: VERIFICATION ONLY? ..." changed to "ENTER ACTION: ..."                      3-2 Under 3.:                      "MSG: VERIFICATION ONLY? ..." changed to ENTER ACTOPM: ..."                      "RSP:" from "NO" to "RC"                      Deleted "MSG: TO RECONFIGURATION DESIRED? ..."                      Deleted "RSP: YES"                      Under 4.:                      Changed "MSG: VERIFICATION ONLY? ..." to "ENTER ACTION: ..."                      Changed - "RSP: NO" to "RSP: I"                      "RSP: 76118" to "RSP: 79118"                      "RSP: \$ FFFF 8" to "RSP: \$ FFFF"                      "RSP: \$40 5" to "RSP: \$"                      "RSP: \$ - 40 5" to "RSP: \$-"                      3-3 Changed - "DPD 673221 USERB U 76118 JACK SMITH" to                      "DPD 673221 USERB U 79118 JACK SMITH"                      "\$ FFFF 8" to "\$ FFFF"                      "\$ 40 5" to "\$"                      "\$ - 40 5" to "\$ -"                      Revised parameters a-f                      4-1 Added 17-20 in "ERROR MESSAGES" list.</p>

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GENERAL

PACK/INIT is designed to label, initialize and verify packs. Removable packs must be initialized before they can be used with B1800/B1700 systems software. The program assigns addresses to the appropriate sectors, writes a random pattern in the sector data area, and reads these patterns back to insure that the sectors are usable.

A 225, 206, or 207 disk pack is rejected as a bad pack and is not usable if the number of errors detected exceeds the default limits in Table 1-1. See "REMOVE" or "LIMIT" options for changing the default error conditions.

	225 Pack -----	206 Pack -----	207 Pack -----
Per cylinder	5	5	-
Per pack	2030	4070	7815

Table 1-1: Default Error Conditions

Note: 225 disk packs are limited to 20 transient errors per cylinder and 1,000 per pack. These are errors that fail during verification but not during retry.

RELATED DOCUMENTATION

Name -----	Number -----
B1800/B1700 SYSTEM/DISK.INIT	P. S. 2212 5488
B1800/B1700 Software Operational Guide	1068731

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### OPERATING INSTRUCTIONS

PACK/INIT does not operate under the control of the MCP and must be loaded and executed through the system cassette reader.

Information will be supplied to the initializer through either the console printer (SPD) or the card reader as to the location, pack-id, type, etc. of the pack(s) to be initialized. A SPD request will appear first (if a card reader is present):

IS CARD INPUT DESIRED? <YES OR NO>

With a response of "YES", the parameters will be expected from the reader. With a "NO" response, the parameters will be expected from the console printer.

### CONSOLE PRINTER (SPD)

A set of messages will be sent to the user and will require a response before the next message in the sequence will appear. To terminate PACK/INIT enter a blank after the first message in the string. The message string is as follows:

1. ENTER UNIT ID <DP?>
2. ENTER ACTION: <I, V, RC, RI, CI, or CV>

Response I	Action
I	: Initialization
V	: Verification only
R or RC	: Reconfiguration - This purges the pack, verifies it, and changes the pack type to that specified. Packs with an Interchange label also are allowed. This response will skip the message string to message number 5. (See Note 1)
RI	: Reinitialization - relocates all sectors found to be bad on the previous initialize. (See Note 1)
CI	: Cylinder Initialization - reinitializes only specified cylinders and relocates sectors found to be bad on the previous initialization. This can also be used to restart a previously aborted initialization, within 50 cylinders of the previously aborted cylinder. If cylinder zero is initialized, the pack will be purged. A single cylinder may be initialized without purging the pack provided all sectors in the cylinder are available (ie. no user or MCP data). (See Note 1)

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CV : Cylinder verification - Verifies only specified cylinders

Note 1: These options can only be used for packs that have been initialized previously.

3. ENTER 6 DIGIT SERIAL NUMBER

Any decimal value except zero.

4. ENTER PACK ID

Up to 10 characters with no embedded blanks.

5. ENTER PACK TYPE - <U, S, OR R>

U = Unrestricted

S = System

R = Restricted

6. ENTER 5 DIGIT JULIAN DATE (YYDDD)

Two digits for the year (eg. 1979 - 79) and three digits for the day of the year (eg. December 31st - 365).

7. ENTER OWNER'S NAME

Up to 14 characters.

If an incorrect response is encountered, then an appropriate error message will be displayed and the response will be requested again (See ERROR MESSAGES Section). The user can enter optional parameters through a response after the message that follows:

8. ENTER OPTIONS

At this point optional parameters can be supplied as follows:

REMOVE OPTION

If REMOVE is specified, then after the first five sectors in error have been relocated for a given cylinder, all other sectors found in error for that cylinder will be removed from the master available table. This option overrides the default rejection of a pack if more than five sectors are bad in a cylinder. When the REMOVE option is specified, the pack will be rejected only if it exceeds the default pack error limit, or optionally, a specified pack error limit set with the LIMIT option.

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### LIMIT SPECIFIER OPTION

This option allows the user to specify the total number of errors allowed per pack, not to exceed the number of sectors contained on the disk. Limits are set through the keyword LIMIT which must precede the digit(s) that indicate the number of errors. See table 1-1 for default error conditions.

### MARGINAL SECTORS OPTION (I, RI, or CI only)

Sectors that are known to require relocation or removal can be entered at this time. More than one sector can appear in each ACCEPT, but each address must be a valid decimal address separated by spaces. No more than 1620 sectors can be specified. When using this option during cylinder initialization, ensure the sector falls within the cylinders that are being initialized.

### DOLLAR SIGN OPTIONS

Through dollar sign options, the user has the ability to verify using offset on verification, to change the number of retries on bad sectors, and to modify the number of errors before that sector is considered bad.

\$ [Initialization-pattern] [+ or -] [Number-of-retries [Number of errors]]

The Initialization-pattern (I, RI, or CI) entry is a four digit representation of a hexadecimal pattern (0000-FFFF). If omitted for the first \$ entry in a string, the default pattern will be 263632. For succeeding \$ entries in a string, the default will be verification only, with relocation of bad sectors.

The "+" or "-" entry may be used to indicate that In (+) or Out (-) offset is to be used during verification for 225 and 206 disk packs while "+" indicates "plus threshold" and "-" indicates "minus threshold" for 207 disk pack. If omitted, the default is no offset.

The Number-of-retries entry is used to change the number of retries made on a sector if an exception is encountered. Default is ten retries while the maximum is 255. The Number-of-errors entry is used to change the number of errors a sector can have before it is considered bad. The default is one error; maximum Number-of-errors is one more than the Number-of-retries.

## 9. ENTER CYLINDER

This display is only for the CV or CI actions. One cylinder or a range of cylinders may be specified at this time.

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### CARD READER

Card format (free format):

Initialization:            <drive> I <pack-serial-number> <pack-id>  
                                  <pack-type> [Julian-date] [Owner's name]

Verification:            <drive> V

Reconfiguration:        <drive> R <pack-type>

Reinitialization:       <drive> RI <pack-serial-number> <pack-id>  
                                  <pack-type> [Julian-date] [Owner's name]

Cylinder initialize:    <drive> CI <pack-serial-number>  
                                  <pack-id> <pack-type> [Julian-date]  
                                  [Owner's name]

The <drive> entry is used to specify the unit to be processed.  
 DP<?>

The <serial-number> entry can be any valid decimal number except zero. The <pack-id> entry is the name of the pack. There should be no embedded blanks. The <pack-type> entry can be:

U = Unrestricted  
 S = System  
 R = Restricted

The Julian-date entry should be the Julian date (e.g., 78364) that the pack is initialized. The owner's-id entry can be any 14 character identification the owner desires.

### REMOVE OPTION CARD

If the keyword REMOVE is specified, then after the first five sectors in error have been relocated for a given cylinder, all other sectors found in error for that cylinder will be removed from the master available table. This option overrides the default rejection of a pack if more than five sectors are bad in a cylinder. When the REMOVE option is specified, the pack will be rejected only if it exceeds the default pack error limit, or optionally, a specified pack error limit set with the LIMIT option.

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#### LIMIT SPECIFIER CARD

This option allows the user to specify the total number of errors allowed per pack, not to exceed the number of sectors contained on the disk. Limits are set through the keyword LIMIT which must precede the digit(s) that indicate the number of errors. See table 1-1 for default error conditions.

#### MARGINAL SECTOR CARD (I, RI, or CI only)

Contains the decimal address (leading zeros optional) of a sector known to require relocation. More than one address may appear on a card, separated by one or more blanks. Multiple cards can be used to specify up to a maximum of 1620 sectors. When using this option during cylinder initialization, ensure the sector falls within the cylinders that are being initialized.

#### DOLLAR SIGN CARD

Allows the user to specify an optional pattern for initialization, verification with offset, and/or the number of retries on bad sectors. The card format is the same as the dollar sign option format. (See DOLLAR SIGN OPTIONS for details.)

#### CYLINDER CARD (CI or CV only)

This card is used to specify the cylinder to be initialized or verified, or a range of cylinders may be specified. The first entry on this card must be the letters "CYL". The first number would be the starting cylinder; the last number would be the ending cylinder. Spaces must separate each token.

Example: " 1 - 10 " would initialize or verify cylinder one through cylinder ten.

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DEFAULT INITIALIZE/VERIFY PROCEDURES

225 disk  
-----

Initialize with pattern 26DB62  
Read/Verify three passes (0, +, -)  
Write with pattern 263632  
Read/Verify three passes (0, +, -)

206 disk  
-----

Initialize with pattern 263632  
Read/Verify three passes (0, +, -)  
Write with pattern 29C9C2  
Read/Verify three passes (0, +, -)

207 disk  
-----

Initialize with pattern 200002  
Write with pattern 26DB2  
Read/Verify three passes (+, -, 0)  
Write with pattern 2DB62  
Read/Verify three passes (+, -, 0)  
Write with pattern 2B6D2  
Read/Verify three passes (+, -, 0)

Note: (0, +, -) indicates verify at normal position (0), offset in (+) and offset out (-). For 207, the offset is considered threshold.

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SAMPLE STRINGS

1. Normal I/V operations:

From SPO

MSG: ENTER UNIT ID <DP?>  
 RSP: DPA  
 MSG: ENTER ACTION: <I, V, RC, RI, CI, or CV>  
 RSP: I  
 MSG: ENTER 6 DIGIT SERIAL NUMBER  
 RSP: 091543  
 MSG: ENTER PACK ID  
 RSP: USERABC  
 MSG: ENTER PACK TYPE - <U, S OR R>  
 RSP: U  
 MSG: ENTER 5 DIGIT JULIAN DATE (YYDDD)  
 RSP: 79150  
 MSG: ENTER OWNER'S NAME  
 RSP: JOHN DOE  
 MSG: ENTER OPTIONS  
 RSP:

From Card Reader

DPA 091543 USERABC U 79150 JOHN DOE  
 ?END

This will initialize and verify the disk pack on DPA with the default INITIALIZE/VERIFY procedure.

Note: The address of every bad sector is relocated, or removed at verification time. The pack label will contain:

Pack ID = USERABC  
 Serial number = 091543  
 Type = UNRESTRICTED  
 Julian date = 79150  
 Owner's name = JOHN DOE

2. Verification only:

From SPO

MSG: ENTER UNIT ID <DP?>  
 RSP: DPB  
 MSG: ENTER ACTION: <I, V, RC, RI, CI, or CV>  
 RSP: V

From Card Reader:

DPB V

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?END

This will verify the disk pack on DPB and report any bad sectors.

3. Normal reconfiguration operation:

From SPO

MSG: ENTER UNIT ID <DP?>  
 RSP: DPC  
 MSG: ENTER ACTION: <I, V, RC, RI, CI, or CV>  
 RSP: RC  
 MSG: ENTER PACK TYPE - <U, S or R>  
 RSP: U

From Card Reader:

DPC R U  
 ?END

This will purge the disk pack on DPC, verify with a single pass, and relabel the disk as an unrestricted pack.

4. Marginal Sector and Dollar Sign options:

From SPO

MSG: ENTER UNIT ID <DP?>  
 RSP: DPD  
 MSG: ENTER ACTION: <I, V, RC, RI, CI, or CV>  
 RSP: I  
 MSG: ENTER 6 DIGIT SERIAL NUMBER  
 RSP: 673221  
 MSG: ENTER PACK ID  
 RSP: USERB  
 MSG: ENTER PACK TYPE - <U, S, OR R>  
 RSP: U  
 MSG: ENTER 5 DIGIT JULIAN DATE (YYDDD)  
 RSP: 79118  
 MSG: ENTER OWNER'S NAME  
 RSP: JACK SMITH  
 MSG: ENTER OPTIONS  
 RSP: 98385  
 MSG: ENTER OPTIONS  
 RSP: \$ FFFF  
 MSG: ENTER OPTIONS  
 RSP: \$ 6363 + 40 5  
 MSG: ENTER OPTIONS  
 RSP: \$  
 MSG: ENTER OPTIONS  
 RSP: \$ -  
 MSG: ENTER OPTIONS  
 RSP:

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From Card Reader

DPD 673221 USERB U 79118 JACK SMITH  
98385  
\$ FFFF  
\$ 6363 + 40 5  
\$  
\$ -  
?END

These parameters will:

- a. Initialize DPD using the default I/V procedures.
- b. Initialize with 2FFFF2 and verify without offset.
- c. Initialize with 263632 and verify offset in(+).
- d. Verify with normal read.
- e. Verify with offset out(-).
- f. Retry all errors in all the verify passes forty times on bad sectors and relocate or remove the sector if it has failed at least five times.

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### ERROR MESSAGES

1. NO PACKS ON SYSTEM
2. THE FOLLOWING SECTORS ARE IN ERROR
3. THEY WILL BE RELOCATED  
Initialization only.
4. DISK ERROR - RESULT STATUS IN "T"
5. WRITE LOCKOUT <drive>
6. DISK NOT READY <drive>
7. DISK NOT PRESENT <drive>  
Drive specified is not being recognized.
8. PACK HAS EXCEEDED ERROR LIMITS  
Errors have exceeded the default error conditions (see table 1-1) or the limit specified in the optional LIMIT entry.
9. PACK CANNOT BE USED WITH MCP  
The master available table is filled or 6 bad sectors were found within the first 64 sectors.
10. INVALID DRIVE ENTRY <entry>
11. ERROR ON CYL 0 <address>
12. INVALID SERIAL NUM. <serial number>
13. INVALID ENTRY BLANK ID
14. INVALID ENTRY <card entry>
15. INVALID SECTOR NUM. <sector number entry>
16. SECTOR REMOVED <disk address>
17. INVALID CYLINDER NUM. <cylinder requested>
18. BAD LABEL OF TABLE - CANNOT <action requested>
19. SECTOR TABLE EXCEEDS LIMIT - WILL USE ONLY THE FIRST 1,620 SECTORS IN THE TABLE OF - <drive>
20. MASTER AVAILABLE TABLE HAS BEEN FILLED

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