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B1800/B1700 SYSTEM/DISK.INIT P.S. 2212 5488 (F)

COMPUTER SYSTEMS GROUP SANTA BARBARA PLANT

REV	REVISION		PRODUCT SPECIFICATION					
TR	ISSUE DATE	APPROVED BY	REVISIONS					
F	8-20-79	Shale	Changes for Mark 9.0 Release					
			1-1 Deleted "which runsMCPII," from GENERAL paragraph. Replaced "not defective" with "usable" in GENERAL.					
			2-1 Added "backup" to "A listing will besectors" to OPERATING INSTRUCTIONS. Deleted "It will bejobs" from OPERATING INSTRUCTIONS. Added "relocated or removed sector" to "Executing the programto backup" in OPERATING INSTRUCTIONS. Deleted "and cylinder zero: from CI section. Added last sentences "If cylinder zerouser on MCP data)." to CI section. Changed "*" in R or RC, RI, & CI sections to "(See Note 1)".					
			2-2 Deleted "and have in tact." from "Note 1: These options" sentence.					
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GENERAL

SYSTEM/DISK.INIT is designed to label, initialize and verify both packs and cartridges. Removable disk cartridges and 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.

INITIALIZATION STANDARDS

If a sector on a disk cartridge is found to cause errors, the entire track in which it resides is removed from the Master Available Table. Should a sector have to be removed from among the first 64 sectors of the disk, that disk cannot be used with 0100/01/00 systems software. When a sector on a disk pack is found to cause errors, it is relocated on a spare sector. A 225, 206, or 207 disk pack is rejected and is unuseable 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 Packs	206 Packs	207 Packs
Per cylii	ner 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		
		••		V - 1				
B1800/	81700	Software	Operational	Guide		1068731		
B1800/	B1700	MCP II	•		P. S.	2212 5462		

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OPERATING INSTRUCTIONS

The SYSTEM/DISK.INIT program operates under the control of the MCP and can be executed through either the keyboard console or the card reader. A backup listing will be produced containing the relocated or removed sectors. Executing the program with SW = 1 will produce the relocated or removed sector report on the SPO instead of sending it to backup.

KEYBOARD CONSOLE (SPO)

When executed from the SPO, SYSTEM/DISK.INIT responds with a set of messages followed by an ACCEPT message for each. With each valid ACCEPT, the next message in the string will appear. To stop SYSTEM/DISK.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 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 - Verfies 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>

ENTER PACK TYPE - <u, S, R, or I> (225 disk pack only)

U = Unrestricted

S = System

R = Restricted

I = Interchange (225 disk pack only)

6. 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).

7. ENTER OPTIONS

At this point optional parameters can be supplied as follows:

REMOVE OPTION

If REMOVE is specified (not valid for cartridge), then after the first five sectors in error have been relocated for a given cyliner, 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 5 sectors in a cylinder cause errors. 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 entry, but each address must be a valid decimal address separated by spaces. When using this option during cylinder initialization, the sector address must fall within the cylinders that are being initialized.

DOLLAR-SIGN OPTIONS

Through dollar-sign options, the user has the ability to add initialization passes (I, RI or CI only), to verify offset or compare on verification, to change the number of retries on sectors that cause errors, and to modify the number of errors before that sector is considered defective.

\$ [Initialization=pattern] ((+ or =) or (C or CR)] [Number=of=retries] [Number=of=errors]

The Initialization-pattern (I,RI, or CI only) 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 verify only, with relocation of bad sectors.

The "+" or "-" entry is used to change the way a disk pack can be read during verification. The "+" indicates "read offset in" and "-" indicates "read offset out". The "C" or "CR" entry is used for disk cartridges to specify compare (C) or compare and remove (CR) during verification. If this entry is omitted, normal verification will be done without offset or comparison.

The Number-of-retries entry is used to change the number of retries made on a sector if an exception is encountered. The default is ten retries. This entry will be valid during the entire process.

The Number-of-errors entry is used to change the default for the number of times a sector can fail during successive retries before that sector is considered to be a sector that causes errors. The default is one failure for pack or eight failures for cartridge. This entry will be in effect through the entire process.

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8. 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.

CARD READER (80 DR 96 COLUMNS)

The SYSTEM/DISK.INIT execute control deck has the following format:

?EXECUTE SYSTEM/DISK.INIT FILE SPEC NAME <SPEC FILE ID>;
?DATA <SPEC FILE ID>
(Specification cards)
?END

All specifications are free form (up to 96 columns) and must be separated by one or more spaces.

SPECIFICATION CARD FORMAT

<drive> I <pack-serial-number> <pack-id>

<pack=type> [Ouner's name]

Verification: <drive> V

Reconfiguration: <drive> RC <pack-type>

Reinitialization: <drive> RI <pack=serial=number> <pack=id>

<pack=type> [Owner's name]

Cylinder initialize: <drive> CI <pack-serial-number> <pack-id>

<pack=type> [Owner*s name]

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

DP < 2>

The <pack-serial-number> entry can be any decimal value except zero.
The <pack-id> entry can contain up to ten characters with no embedded blanks. The <pack-type> entry can be:

U = Unrestricted

S = System

R = Restricted

I = Interchange (225 disk pack only)

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REMOVE OPTION CARC

If the keyword REMOVE is specified (not valid for cartridge), 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 5 sectors in a cylinder cause errors. 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. The REMOVE option must be specified prior to any marginal sector or dollar sign options when required for the standard pack initialization process.

LIMII 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. This card must be specified prior to any marginal sector or dollar sign cards for the standard pack initialization process.

MARGINAL SECTOR CARD (I. RI. or CI only)

This provides the initializer with information about known bad sectors. The format is the same as the Marginal Sector Option format, except that it will be entered through the card reader. When using this option during cylinder initialization, the user should ensure that the sector falls within the cylinders that are being initialized.

DOLLAR-SIGN CARD

The dollar-sign card allows optional patterns for initialization, the ability to verify offset or compare data, change the number of retries on error-causing sectors, and change the number of errors before that sector is considered as such. The format is the same as the Dollar-Sign Option format except that it will be on a free formatted card (See DOLLAR-SIGN OPTIONS for details).

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CYLINDER CARD (CI or CV only)

This card is used to specify the cylinder or range of cylinders to be initialized or verified. 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: "CYL 1 - 10 " would initialize or verify cylinder one through cylinder ten.

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DEFAULT INITIALIZE/VERIFY PROCEDURES

225 disk

Initialize with pattern 360863 Read/Verify three passes (0, +, -) Write with pattern 363633 Read/Verify three passes (0, +, -)

206 disk

Initialize with pattern 463634 Read/Verify three passes (0, +, -) Write with pattern 490904 Read/Verify three passes (0, +, -)

207 disk

Initialize with pattern 200002
Write with pattern 26DB2
Read/Verify three passes (+, -, 0)
Write with pattern 20B62
Read/Verify three passes (+, -, 0)
Write with pattern 28602
Read/Verify three passes (+, -, 0)

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

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SAMPLE EXECUTE STRINGS

CARD READER

1. Normal I/V operations for disk pack:

DPA 091543 USERABC U JOHN DOE

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

Any sector found to cause errors during a verification pass will be relocated or removed.

The pack label will contain:

Pack ID = USERABC
Serial Number = 091543
Type = Unrestricted
Julian Date = The system date
Owner's ID = JOHN DOE

2. Normal I/V operation for disk cartridge:

DCA 084673 ABC U J. B. JONES

This card will initialize a disk cartridge with a 463634 pattern and verify it on DCA with a label of:

Pack IC = ABC
Serial Number = 084673
Type = Unrestricted
Owner's ID = J. B. JONES

3. Specification cards for disk cartridge:

DCD 123456 ABC S 7486 \$ C

This set of cards will initialize and verify DCD as a system cartridge with a Cartridge ID of ABC and a serial number of 123456. It will also remove the track containing sector 7486 and will then compare data during verification.

4. Specification cards for disk pack:

DPC 797601 XYZ U 98385 18877 29765 479665 \$ FFFF \$ +

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This set of cards will initialize DPC with the default I/V procedures, then initialize DPC with an initialization pattern of affffa, verify one pass without offset, and one pass with offset in(+). It will also relocate address 98385, 18877, 29765 and 479665.

5. Specification cards for reconfiguration:

DPC RC U

This specification purges the disk pack on DPC, verifies with a single pass, then relabels the disk as an unrestricted pack.

SPU

RSP:

Normal I/V operation

MSG: SYSTEM/DISK.INIT = <job-number>ENTER UNIT ID <DC? or DP?> MSG: SYSTEM/DISK.INIT = <job-number>ACCEPT RSP: <iob-number>AX DPB MSG: SYSTEM/DISK-INIT = <job-number>ENTER ACTION : <I,V,RC,RI,CI, or CV> MSG: SYSTEM/DISK.INIT = <job-number>ACCEPT RSP: <iob-number>AX I MSG: SYSTEM/DISK.INIT = <job-number>ENTER 6 DIGIT SERIAL NUMBER MSG: SYSTEM/DISK.INIT = < job-number > ACCEPT RSP: <job=number>AX 179846 MSG: SYSTEM/DISK.INIT = <job-number>ENTER PACK ID MSG: SYSTEM/DISK.INIT = <job-number > ACCEPT KSP: <iob-number>AXABC MSG: SYSTEM/DISK.INIT = <job-number>ENTER PACK TYPE<U, S, OR R> MSG: SYSTEM/DISK.INIT = <iob-number>ACCEPT RSP: <iob=number>AXU MSG: SYSTEM/DISK.INIT = < job-number>ENTER OWNER'S ID MSG: SYSTEM/DISK.INIT = <iob=number>ACCEPT RSP: <iob=number>AXS-B-GARVEY MSG: SYSTEM/DISK.INIT = <job-number>ENTER OPTIONS MSG: SYSTEM/DISK.INIT = <iob-number>ACCEPT

These responses will initialize and verify, with the standard default I/V process, disk pack "B" with the label information of:

Pack-id = ABC Serial Number = 179846 Type = Unrestricted Julian Date = The system date Owner's ID = S.8.GARVEY

<iob=number>AX

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Normal verification only operation:

MSG: SYSTEM/DISK-INIT = <job-number>ENTER UNIT ID <DC? OR DP?>

MSG: SYSTEM/DISK.INIT = <job-number>ACCEPT

RSP: <job-number>AXDCC

MSG: SYSTEM/DISK.INIT = <job-number>

ENTER ACTION: <I, V, RC, RI, CI, or CV>

MSG: SYSTEM/DISK.INIT = <job=number>ACCEPT

RSP: <job=number>AXV

These responses will verify the cartridge on drive "C" and report any error-causing sectors encountered.

Normal reconfiguration operation:

NSG: SYSTEM/DISK.INIT = <job=number>ENTER UNIT ID <DC? OR DP?>

MSG: SYSTEM/DISK.INIT = <job=number>ACCEPT

RSP: <job=number>AXDPC

MSG: SYSTEM/DISK.INIT = <job=number>

ENTER ACTION: <I, V, RC, RI, CI, or CV>

MSG: SYSTEM/DISK.INIT = <job=number>ACCEPT

RSP: <iob-number>AXRC

MSG: SYSTEM/DISK.INIT = <job-number>ENTER PACK.TYPE - <U, S, OR R>

MSG: SYSTEM/DISK.INIT = <job-number>ACCEPT

RSP: <iob-number>AXS

These responses will purge the pack on DPC, verify with a single pass, and relabel the disk with a pack type of "S".

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ERROR MESSAGES

- 1. INVALIC ENTRY BLANK ID
- 2. INVALIC ENTRY <entry>
- 3. INVALID SERIAL NUM.
- 4. INVALID SECTOR NUM.
- 5. THE FOLLOWING SECTORS ARE IN ERROR
 AND WILL BE RELOCATED (Pack initialization only)
 AND THEIR TRACKS WILL BE REMOVED (Cartridge initialization only)

This is a safety measure to insure that this disk is the correct one for initialization only. Answer yes or no.

7. WOULD YOU LIKE TO RETRY? <YES OR NO>

"YES" will retry the operation. "NO" will terminate this process.

8. DISK ERROR - RESULT = <Result status>

An error has occurred during a write or relocation.

- 9. MUST RESTART TO CONTINUE
- 10. WRITE LOCK <unit-id>

Initialization only.

- 11. DISK NOT READY <unit-id>
- 12. PACK CANNOT BE USED WITH MCP <unit-id>

Une of the first 64 sectors has been removed, the Master Available Table has been filled, or the error limit of the pack has been reached.

13. PACK HAS EXCEEDED ERROR LIMIT <unit-id>

Errors have exceeded the default error conditions (see table 1-1) or the limit specified in the optional LIMIT entry.

14. ERROR CYL O <unit-id> <disk address>

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- 15. SECTOR REMOVED <disk address>
 - Disk Pack Initialization only.
- 16. COMPARISON ERROR <disk address>

The "C" or "CR" option is on and this sector was found to be in error.

- 17. INVALID CYLINDER NUM. < Cylinder requested>
- 18. BAD LABEL OR TABLE CANNOT <action requested>
- 19. SECTOR TABLE EXCEEDS LIMIT WILL USE ONLY THE FIRST 188,940 SECTORS IN THE TABLE OF <drive>
- 20. MASTER AVAILABLE TABLE HAS BEEN FILLED

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