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COMPUTER SYSTEMS GROUP
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CONTROL DOC.	REV

DOCUMENT TRANSMITTAL

PLANT IDENT	0 , 1 , 4

SYSTEM/PRODUCT ___B1800/B1700___

DISTRIBUTION TYPE _____

UNIT NAME _____

PROJ. NO. _____

COORD. _____ CHKR. _____ RECORDS ISSUE DATE _9 - / (/ ?_

DOC PFX OR DWG SIZE	DOCUMENT NUMBER	REV OR ISSUE	DOCUMENT DESCRIPTION	ENG. RECORDS ONLY				REMARKS
				QTY REV PAGE	COPIES EACH PAGE	BOND	VELLUM	
P.S.	2212 5090	H	PACK/INIT	15	64			
DOCUMENT TRANSMITTAL								

PRODUCT   SPECIFICATION

REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
H	8-20-79	J. Hale	Changes for Mark 9.0 Release

Changes for Mark 9.0 Release

1-1   Rewrote first paragraph of GENERAL section.

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)".

2-2   Deleted "and have...in tact." from "Note 1:   These
options..." sentence.

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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

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 (SPO) or the card reader as to the location,
pack-id, type, etc.   of the pack(s) to be initialized.   A SPO
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 (SPO)

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 363632. 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.

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.

DEFAULT INITIALIZE/VERIFY PROCEDURES

225 disk

    Initialize with pattern ә6DB6ә
    Read/Verify three passes ((0, +, -)
    Write with pattern ә6363ә
    Read/Verify three passes (0, +, -)

206 disk

    Initialize with pattern ә6363ә
    Read/Verify three passes (0, +, -)
    Write with pattern ә9C9Cә
    Read/Verify three passes (0, +, -)

207 disk

    Initialize with pattern ә0000ә
    Write with pattern ә6DBә
    Read/Verify three passes (+, -, 0)
    Write with pattern әDB6ә
    Read/Verify three passes (+, -, 0)
    Write with pattern әB6Dә
    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.

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

```
?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 ƏFFFFƏ and verify without offset.

c.   Initialize with Ə6363Ə 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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