

## **D-SERIES FLASH FIRMWARE REVISION HISTORY**

### **Version 1.17**

1. Corrected problem with long initialization time after library (without flipper station) is reset.  
(No problem exists when library has flipper station,  
this fix corrects 1.15a and 1.16 problem of not being seen by host.)

### **Version 1.16**

1. Added support for the Panasonic Multi-drive (SW-9751).
2. Corrected problem with Cycle to Flip test in Maintenance mode. The test only worked properly if media was in the tray being cycled, now it works with an empty tray as well.
3. Corrected error codes returned when auto-offsets fails. Error codes indicate what part of the auto-offset sequence failed.
4. Added Production Cycle option for Manufacturing so that test drives could be used in running production cycles. Library does not wait for drives to spin up before moving media out of the drive. This is implemented using one of the DIP switches on the controller board.
5. Changed Version number to 1.16

### **V1.15A**

Added code to force calculation of Auto offsets the first time the library is powered on after it has been parked.

Corrected problem where one drive was not reported correctly with a Read Element Status command when the library did not have a flipping station installed.

Remove B6 error, which was being reported in the Error log when non-flipper libraries power up.

Changed the Release date to 11/15/2002.

Changed version number to V1.15 then to V1.15A

V1.14G 5 Feb 2002 - release on ADR SW02-2

170 Enhanced technique for loading of tray into second  
flipper slot for before setting second flipper side offsets.

169 Added "Test Display" selection to Maintenance Mode->Production  
Tests menu. This turns on all pixels of the display for visual  
inspection.

V1.14F 22 Aug 2001

168 Fixed how slot offsets are scaled.

167 Fixed slot position error for first four magazines above left support  
brace on a D480.

V1.14E 17 Jul 2001

166 Adjusted starting position for flipper auto offset.

165 Non volatile ram is now compatible with non flipper version of firmware.

V1.14D 11 Jul 2001

164 Modify non-volatile ram layout.

V1.14C 20 Jun 2001

163 When storing to the flipper, extend picker an extra .055" and hold the extended position for .25 seconds.

V1.14B 29 May 2001

162 Added support for optional flipper.

V1.14 10 Apr 2001

161 Fixed the starting offsets for CD-RW drives in the D120 and the starting offsets for DVD-RAM drives in all models.

V1.13 28 Feb 2001

160 Added support for the following drives:

- Panasonic SW-9501-S DVD-R drive
- Hitachi GF-2050 DVD-RAM drive
- Plextor 1012 CDRW drive

V1.12 20 Aug 2000

159 Read Magazine Status command was not returning correct information for last magazine installed.

158 Added check of Starting Magazine Number in Read Magazine Status command for a value of zero. The library will now return Invalid Field in CDB for this value.

V1.11 5 Jan 2000

157 Changed to clamp Hitachi DVD-RAM drives when library system is parked (using Send Diagnostics command or from Setup menu).

156 Fixed bug in which the InEnab and ExEnab bits of the Read Element Status command's import/export element descriptor were not being set to zero when a Prevent/Allow Medium Removal command was issued to put the library in the prevent medium removal state.

155 Added support for the Panasonic 8x20 CDR drive.

154 Changed to disconnect from SCSI bus during data organization portion of Read Element Status command. Previous firmware generated data underrun errors when host was trying to read from or write to a drive at the same time the Read Element Status command was issued to the changer.

153 Fixed bug in handling an Abort message from the host after the library had disconnected to process a command. The library was not releasing the SCSI bus.

V1.10 7 Apr 1999

152 Fixed bug which would cause Open/Close Drawer command to return good status when it had really failed.

151 Fixed bug in which Prevent Medium Removal command with Drawer and Prevent bits set would not prevent drawer from opening when moving a tray to it with the Move Medium or Exchange Medium commands.

150 Fixed bug in which the import/export drawer would open if the lift was permanently blocked during an import.

149 Fixed bug which could prevent operator from opening the drawer in certain situations.

148 Fixed bug which would cause drawer to reopen and library to mispick if a front panel key was pressed while importing or exporting a disk via an Exchange Medium command with the import/export drawer as the first destination.

- 147 Eliminated race condition between front panel drawer open button presses and moves or exchanges from import/export drawer.
- 146 Fixed bug wherein the timeout was too short when loading drives with the Wait on Load (WaitLoad) option selected.
- 145 Fixed bug in data transfer element descriptor data returned by Read Element Status. If a drive is not present or turned off, IDValid and LUValid fields will now be set to zero.
- 144 Fixed bug which could cause a "20 DRIVE UNCLAMP BOUNCE" error if the drive being unloaded takes longer than 5 seconds to unclamp.
- 143 Fixed a bug which could cause the unit to delay 1 extra second before performing some functions. This could occur if a drive was loaded and clamped during a power cycle.
- 142 Fixed a bug that will continuously generate a drive unclamp error if the picker was last positioned in front of a drive that is now removed or the cables to the drive are disconnected.
- 141 Fixed a bug that would prevent the last drive from being initialized to the clamp state after power to the unit is cycled and a disk is in the drive.
- 140 Fixed bug which caused mismatch between error number and description displayed on front panel in certain cases.
- 139 Fixed bug in incrementing of error statistics number of recoverable and unrecoverable errors. Also changed so that error statistics are only updated for errors generated in response to a SCSI command.
- 138 Fixed bug which would cause a home lift failure if picker 2 was positioned in front of the import slot and the lift is homed in a 480 disk unit.
- 137 Fixed bug which prevented a tray from being moved from a picker if the Limit Recovery flag was not set.
- 136 Fixed a bug which prevented an exchange from a picker to a slot or drive to the other picker. This type of exchange could be used for high throughput and fast time-to-data disk swapping if a disk was left in a picker and alternately swapped with a storage slot and then a drive.
- 135 Fixed bug in Exchange Medium when a medium transport element was used as a second destination element but not as a source element. The cartridge was not being left in the second destination element but rather moved to the source element.
- 134 Fixed recovery from a power loss during the picking of a tray. Picker would previously try to push the tray between magazines.
- 133 Fixed recovery from a power loss during the storing of a tray. If the vertical path sensor was not blocked on power up the tray would be left in the destination slot but the status of the slot would be set to empty.
- 132 Fixed bug in Setup->Drive Tests->Disk Information in which an improper Drawer Close Fail error would be displayed.
- 131 Fixed problem where Rezero Unit and Setup->Return all Trays would leave a tray in the picker if the tray magazine was unknown.
- 130 Added check for tray present in import/export before allowing Open/Close Drawer command to open or close the drawer.
- 129 Changed so that library reinitializes itself if it receives a SCSI reset or bus device reset.
- 128 Changed source storage element address in Read Element Status element descriptors as follows: if tray is moved from storage element 'A' to another element such as a drive 'D', and then another tray is moved from a different storage element 'B' into 'A', then the source element address of the tray in drive 'D' is changed from 'A' to 'B'. This was

done to make it easier to return all trays prior to opening the front access door.

- 127 Extended the eject signal debounce time from 100ms to 150ms.
- 126 Added new error code "57h TRAY DISENGAGED". This error will be displayed instead of "8A UNEXP TRAY TYPE" if a tray becomes unhooked from the picker during a pick.
- 125 Removed all PD media options.
- 124 Added a new mode setting to force verify on write for DVD drives (byte 3 bit 4 of Mode Select/Sense Mode Parameters Page 3 or settable via Mode Settings in setup menu).
- 123 Added cumulative count thresholds. By enabling thresholds via byte 4 bit 1 of Mode Select Parameters Page 2, or by changing this option via Mode Settings in the setup menu, the library can warn applications that a count value has met or exceeded a threshold value. Log Sense can be issued to retrieve current threshold settings and new settings can be established using Log Select. Default threshold values at not valid for this release.
- 122 Added additional fields to Log Sense Unit Statistics page. The new InitReqd bit (byte 31 bit 7) will be set if the next SCSI command using the library's robotics will cause the library to initialize itself. The new LastMTE field in byte 31, bits 5 and 6, will contain the number of the last MTE used - 1 or 2.
- 121 Added SET MEDIA REGION to setup mode menu. This selection allows the appropriate world region code to be set on all DVD-RAM drives so that CSS enabled video disks can be played. It may require a disk from the same world region as that the drives are to be set to.
- 120 Added STORE ALL TRAYS to maintenance mode menu. This selection will move all trays into magazines. It differs from RETURN ALL TRAYS in setup mode and the Rezero Unit command with NoTrayRet bit set to zero in that it will also move trays whose source magazine is unknown. It will store these trays in any vacant magazine slot.
- 119 Added new bit to event history type. Setting bit 7 will now cause only SCSI commands which effect a change to the library to be logged. Test Unit Ready, Request Sense, Inquiry, Mode Sense, Log Sense, Read Element Status, and Read Magazine Status commands will not be logged in event history list. This was added to reduce the amount of non-relevant information logged for diagnosing library system/host software problems.
- 118 Changed default event history type to BBh (187) for new library systems.
- 117 Added enhancement to setup mode Event History display. Pressing left-most key three times will now show current list position relative to end of list (oldest event). This is the same order as the test program, DSERTEST.
- 116 Will now dump stack to event history list in case of a stack overflow.
- 115 Changed so that if control board DIP switch 2 is on, then library will stop immediately when it encounters an unrecoverable error, rather than returning trays and disks to their source elements (for factory use only).

V1.09 2 Sep 1998

- 114 Fixed bug which prevented NotBus bit from being set in data transfer element descriptor for drives not on changer bus.
- 113 Fixed bug causing selection timeouts when polling for library to be ready after a magazine exchange.
- 112 Fixed bug in which invalid element addresses in a command would cause

- reservation conflict errors rather than invalid element address errors.
- 111 Fixed bug which caused lockup when disk inserted for Drive Tests -> Disk Information.
  - 110 Fixed bug which caused wrong disk capacity to be returned in Drive Tests -> Disk Information.
  - 109 Fixed bug which could cause the wrong drive to be loaded during library power-on recovery sequence if the library system lost power while moving a disk from a drive (bug introduced in V1.08).
  - 108 Fixed bug which caused the unit to not recognize a single DVD RAM drive installed in the last drive bay.
  - 107 In drive address setup, simplified the selection of whether the drive is on or off the SCSI bus of the changer device. An option to change the on/off changer bus state is now displayed after the drive id has been selected.
  - 106 Added cycles since error occurrence to more information display in error log.
  - 105 Changed to keep loaded drives clamped upon power-up.
  - 104 Changed to display and return the first non-recoverable error encountered for fatal hardware errors, rather than the last error encountered. Typically, the first error encountered occurs at the lowest level of machine control and subsequently generates additional errors at higher levels. By returning the first rather than the last error encountered, more accurate information about the true cause of the problem is available to the host.
  - 103 Added check of sensor for tray in import/export drawer if failed to pick tray from drawer.
  - 102 Made drawer closing code more robust.
  - 101 Added warning if tray slides out of magazine when inserting new magazine during magazine exchange operation. Disallow door closure if tray is blocking lift.
  - 100 Changed maintenance mode Move Tray test to allow scrolling down through elements in addition to scrolling up through them.

V1.08 Flash 27 May 1998

- 099 Fixed bug in 480 slot units causing a position failure when scanning after exchanging magazines.
- 098 Lowered the elevation of picker 1 to prevent the storing or jamming of a tray into the magazine slot above the target slot.
- 097 Improved the checking of the unclamp switch state to prevent false 20h (drive unclamp bounce) and 21h (unclamp switch fail) errors.
- 096 Added support for Hitachi DVD-RAM drive.
- 095 Added Write Cache Enable mode setting for DVD-RAM drives (byte 3 bit 3 of Mode Select/Sense Mode Parameters Page 3).
- 094 Fix bug which caused wrong error to be returned when doing an exchange with PD trays where destination element was empty.
- 093 Added Drive Test capability for drives off of changer bus (split-bus configuration).
- 092 Changed to more intuitive error display if operator failed to insert disk during import via Exchange Medium command.
- 091 Added recurrence count to front panel error log display.

V1.07 24 Apr 1998

- 090 Increased the delay time before retracting the import drawer during production cycle and during cycle to drawer.

- 089 Improved the loading of drives that are further away from the picker.
- 088 Added Restart Library to setup menu.
- 087 Changed maintenance mode cycle-full, and cycle-2-trays, and demonstration to always load full trays if Wait On Load mode is set.
- 086 Fixed bad drive number display when trying to turn on a drive that was already on from the front panel.
- 085 Changed to save lift position in error log for most hardware errors.

V1.06 Flash 21 Jan 1998

- 084 Fixed bug wherein if a drive address was set Not On Changer Bus, it could not be changed to an address back on the changer bus.
- 083 Added a new mode setting to setup for selecting the 512 byte sector size option (byte 3 bit 2 of Mode Select/Sense Mode Parameters Page 3).
- 082 Added error codes 20 and 21 for the detection of a drive unclamp switch bounce and switch failure.
- 081 Added fail safe code in the loading and unloading of a drive. This is to prevent damaging media if the drive tries to clamp while the media is in transit.
- 080 Fixed bug which could cause FB error - two devices responding to same selection.
- 079 Fixed error recovery problems for Exchange Medium command.
- 078 Improved the detection of the tray type installed in magazines.

V1.05 7 July 1997

- 077 Fixed bug that causes the picker guide V-block to hit on the import alignment flag during pivot offsets.
- 076 Added pivot offset checking at the lower drive locations.
- 075 Fixed bug in pivot positioning that would allow the pivot to be in the wrong position after homing the lift.
- 074 Fixed bug that gives a picker misposition error when positioning the lift requires a pivot movement.
- 073 Fixed bug which prevented flash firmware from checking firmware checksum in background.
- 072 Fixed error recovery problems for Move and Exchange Medium commands.
- 071 Added MKE 7502 drive type.

V1.04 24 June 1997

- 070 Fixed position to import/export drawer bug.
- 069 Fixed bug in power failure recovery.
- 068 Fixed bug causing intermittent lift failure during the homing of the lift.
- 067 Added code to prevent operator from turning on drive with the same address as another powered-on library system drive on the same bus.
- 066 Added code to prevent the same SCSI ID being assigned to two or more on-line drives via a Mode Select command.
- 065 Fixed bug wherein drive SCSI activity would turn off Active light for changer activity.
- 064 Fixed bug where the state of the import drawer would be set to closed when the drawer was held fully open while trying to close it.
- 063 Fixed bug causing a tray to be partially picked from a drive before the drive fully unclamps during auto offsets.

062 Added 5 sec timeout for SCSI handshaking with host computer.  
061 Added static error messages and status to auto offsets.  
060 Added check for a failed picker home sensor.  
059 Improved the storing of a tray in the import.  
058 Added failure messages to auto offsets.  
057 Fixed bug in which drive address was not being output to drive in maintenance mode Power On Drive test.  
056 Fixed bug wherein 10 byte Mode Sense command would return data in which mode data length field was one too large.  
055 Fixed bug wherein reserved bits in byte 2 of Send Diagnostics command were not being tested.  
054 Changed to not respond to selection if wrong parity on SCSI bus, unless ignore parity mode is set.  
053 Fixed ignore parity bug.  
052 Fixed bug in error recovery where drive tray presence was tested by attempting to pick the tray in the drive without unclamping it first. This bug could cause damage to the media.  
051 Changed to disallow positioning to a reserved element.  
050 Fixed a problem when a tray jams in a magazine causing the undo of a move to fail.

V1.03 21 May 1997

049 Fixed bug in which import/export drawer empty/full status was not correctly updated for import or export when using the Exchange Medium command. This occurred when the library system closed the drawer automatically after the timeout period specified in the Mode Select timeout parameter page had elapsed.  
048 Fixed bug which could cause errors related to offsets not being set, even when they were.  
047 Fixed bug causing the Access bit for the last drive to never be set.  
046 Fixed bug causing the tray status to be lost when a picker position retry is required.  
045 Fixed bug causing library system to return status to wrong initiator when performing drive operations in background with the Emulate LF-J bit set.  
044 Fixed door closure problems.  
043 Added automatic pivot offset setup for D240, D480.  
042 Fixed bug in setup mode Return All Trays in which drives were not being told to unclamp before library system attempted to pick trays.  
041 Fixed bug in Initialize Element Status and setup mode Rescan Elements which would cause the import/export drawer to be set to empty and no tray if the drawer was open when the operation was performed.  
040 Fixed erroneous return data for Mode Sense Device Capabilities Page.  
039 Fixed door opening problem when door was opened by a SCSI command.  
038 Fixed bug in drive address setup in setup mode which would cause address to be set to zero if drive was changed to Off Bus.  
037 Fixed bug related to improper initialization of hot swap states.  
036 Changed setup of changer address in setup mode to check for drive or expander address conflict.  
035 Changed to always allow PD import/export while in maintenance mode.  
034 Simplified addition of bus expanders in Maintenance Mode setup.  
033 Added bus expander information to setup mode configuration summary.  
032 Added issuing of Reserve command before clamp or unclamp, and Release command after clamp or unclamp, when the Emulate LF-J flag is set.

V1.02 29 Apr 1997

- 031 Fixed bug with Reserve command third party element reservations.
- 030 Increased Drawer stepper motor hold time to prevent bounce back in the retracted position.
- 029 Changed resolution of offsets. Maintenance mode Offsets test must be run when upgrading from previous versions!

V1.01 23 Apr 1997

- 028 Lowered the nominal drive offset position by 0.021".
- 027 Improved the reliability of the auto offset function.
- 026 Fixed problem when running motor test after the power is cycled and the lift or picker is repositioned by hand.
- 025 Fixed bug which prevented the same source and second destination address on an Exchange command even when the first destination was the import/export drawer (i.e., on an import or an export of a disk).
- 024 Fixed bug which would allow movement of a tray to a location where there was no magazine.
- 023 Fixed bug which would allow movement of lift while in magazine exchange mode if placed in this mode by a SCSI command from the host.
- 022 Fixed bug which would lock up library system if an error occurred on a SCSI command which was issued after entering and exiting Setup mode.
- 021 Fixed bug which cause 06h 28h 00h to be returned for door closure after servicing a drive, rather than 06h 28h 80h.
- 020 Fixed a problem in cycle tests that could cause a stack overflow after after an error has occurred and the test is restarted.
- 019 Fixed incorrect error displayed if moving to a full import.
- 018 Changed to move the lift to a "finger clear" position when the door is improperly opened while online or in demonstration mode.
- 017 Fixed bug which would cause door to be reported as closed in Read Element Status before it was actually closed.
- 016 Fixed bug which would generate Drawer Close Failure if a command to open the import/export drawer was given while it was being manually closed.
- 015 Fixed bug which would prevent correct magazine type from being returned by Read Magazine Status command.
- 014 Fixed bug which would allow PD disks to be moved to CD magazines, and CD magazines to be moved to PD magazines.
- 013 Changed operation of Exchange Medium command when import/export drawer is specified as the first destination element (import or export). If a full tray is moved to the i/e drawer, the library system will now prompt REMOVE/REPLACE DISK and will accept an empty or full tray. If an empty tray is moved to the i/e drawer, the prompt will be INSERT DISK and the library will return a Source Element Empty error if the tray is pushed in with no disk.
- 012 Eliminated errors 8E and 8F - media not inserted/removed by operator.
- 011 Changed demonstration mode to exit to the menu in the event of an error, after a very brief error display (errors are maintained in error log).
- 010 Changed to disallow move of empty tray to location of another empty tray. This previously swapped empty trays but now gives source empty error.
- 009 Changed to insert tray further into import/export drawer to latch in detent.
- 008 Changed Initialize Element Status to use more accurate method of determining import/export drawer status - attempt is made to pick a tray in the drawer.



- 007 Changed Initialize Element Status to check magazine present/not present states immediately before scanning slots. Magazine present/not present states are now also checked on initial library system power up.
- 006 Added Panasonic/MEI LF-JXXX library system emulation mode. This is settable via the front panel or Mode Select Page 20, byte 4, bit 1.
- 005 Changed to display unpacking messages every time power is cycled until library system initializes properly.
- 004 Changed sense key for Access Door Open and I/E Drawer Open errors from 5=Illegal Request to 2=Not Ready.
- 003 Added new errors for removing packing components and bus expander failures.
- 002 Changed to prevent import/export drawer opening from front panel if import/export element or entire library is reserved by host.
- 001 Fixed bugs in bus expander setup.

V1.00 07 Apr 1997

--- Initial release.