



StorageTek
T10000 Tape Drive
Fibre Channel Interface
Reference Manual
Part Number: E25413-01

Automatic Link Partition
(ALP)
Errata Sheet

Version 1.4

Revision Date 9/26/11

ALP Errata Sheet

Automatic Link Partition (ALP) Errata Sheet

Part Number E25413-01

Oracle welcomes your comments and suggestions for improving this book. Contact us at STP_FEEDBACK_US@ORACLE.COM. Please include the title, part number, issue date, and revision.

Copyright © 2004, 2011, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related software documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle USA, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications which may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure the safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. UNIX is a registered trademark licensed through X/Open Company, Ltd.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

ALP Errata Sheet

Summary of Changes

Date	Version	Description of Changes	Approved By
09-Dec-09	1.0	Initial Draft	Dennis Appleyard
10-Dec-09	1.1	Additions to Locate and Read Position	Dennis Appleyard
13-May-10	1.2	Add ASC/ASCQ 3005	Dennis Appleyard
28-Jul-10	1.3	Changes for T10000C	Dennis Appleyard
06-Jan-11	1.4	Add Oracle Branding Add Erase command and ASC/ASCQ	Dennis Appleyard

ALP Errata Sheet

Contents

Contents.....4

1 Preface5

2 ALP Overview6

3 T10000 Reference Manual Changes.....7

 3.1 Inquiry Command7

 3.1.1 Standard Inquiry Data7

 3.2 Erase Command7

 3.2.1 Long bit.....7

 3.3 Mode Sense Command7

 3.3.1 ALP Control Mode Page.....7

 3.4 Mode Select Command.....9

 3.4.1 ALP Control Mode Page.....9

 3.5 Format Medium Command12

 3.5.1 Format Medium Command.....12

 3.6 Locate Command12

 3.7 Read Position Command13

 3.8 Request Sense Command.....15

 3.8.1 Sense Key with ASC and ASCQ15

ALP Errata Sheet

1 Preface

This Errata Sheet is intended to supplement the T10000 Tape Drive Fibre Channel Interface Reference Manual (Revision L or later) with the following new and modified command features for supporting the Automatic Link Partition (ALP) feature.

The Fibre Channel Reference Manual ALP Errata Sheet is intended for software application developers, and operating system/driver developers implementing ALP on Fibre Channel StorageTek T10000 Tape Drives.

This errata sheet describes information about the StorageTek T10000A, T10000B, and T10000C Tape Drives. The ALP feature is available only on the T10000B and T10000C drives. Where information changes, the following is used to identify them:

- 2FC = T10000A with a 2 Gb interface
 - 4FC = T10000A or T10000B or T10000C with a 4 Gb interface
 - T10000A
 - T10000B
 - T10000C
- FC = Fibre Channel

Terminology and Usage

The following terminology is used throughout this errata sheet:

- Examples of hexadecimal notation are: x'4A', 70h, and 00 10 4F (hex).
- Examples of binary notation are: '0101' (b) or 01b.
- Examples of tape drives, or drives are: StorageTek T10000 Tape Drive, T10000A tape drive, T10000B tape drive, T10000C tape drive or just T10000.
- StorageTek is a trademark of Oracle Corporation.

Documentation Accessibility

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/support/contact.html> or visit <http://www.oracle.com/accessibility/support.html> if you are hearing impaired.

2 ALP Overview

The Automatic Link Partition (ALP) User Specification provides a description of the ALP feature.

The ALP feature is available only on the T10000B and T10000C drives. It is not available on the T10000A drive. The ALP feature supports IDR (In-Drive Reclamation) and TTA (Tape Tiering Accelerator).

The T10000B tape format has 192 ALPs. The T10000C tape format has 480 ALPs.

ALP Errata Sheet

3 T10000 Reference Manual Changes

3.1 Inquiry Command

The following changes apply to the Inquiry data that can be returned.

3.1.1 Standard Inquiry Data

3.1.1.1 ALP Bit

The Standard Inquiry Data has been modified to return Byte 55 Bit 5 as the ALP bit.

An ALP bit set to zero indicates that the logical unit does not support the Automatic Link Partition feature. An ALP bit set to one indicates that the logical unit supports the Automatic Link Partition feature.

3.2 Erase Command

The following changes apply to Erase command.

3.2.1 Long bit

A long erase is not allowed on an ALP tape on a T10000B drive. A long erase is allowed on an ALP tape on a T10000C drive.

3.3 Mode Sense Command

The following changes apply to the Mode Sense data that can be returned.

Page code “11h, subpage E0 = ALP Control Mode page” to be added to the Page Code: field of the Mode Sense command description.

3.3.1 ALP Control Mode Page

The new mode sense page, see Table 1, returns information about the current ALP mode.

Table 1. Mode Sense ALP Control mode page – T10000B

Byte	Bit								
	7	6	5	4	3	2	1	0	
0	PS (0)	SPF (1)	Page Code (11h)						
1	Subpage Code (E0h)								
2 - 3	Page Length (0442h)								
4	Reserved			LINKS	W_MSK	RSVD	ALP_T	ALP_C	
5	Reserved								
6-69	ALP Write Mask								
70-1093	ALP Linkage Report								

Table 2. Mode Sense ALP Control mode page – T10000C

ALP Errata Sheet

Byte	Bit								
	7	6	5	4	3	2	1	0	
0	PS (0)	SPF (1)	Page Code (11h)						
1	Subpage Code (E0h)								
2 - 3	Page Length (0902h)								
4	Reserved			LINKS	W_MSK	L_MSK	ALP_T	ALP_C	
5	Reserved								
6-133	ALP Write Mask								
134 - 2181	ALP Linkage Report								
2182 - 2309	ALP Lock Mask								

LINKS

Linkage Report Valid

0 = ALP Linkage Report data is not valid

1 = ALP Linkage Report data is valid

W_MSK

Write Mask valid

0 = Write Mask is not valid

1 = Write Mask is valid

L_MSK

Lock Mask valid

0 = Lock mask is not valid

1 = Lock mask is valid

ALP_T

ALP Tape

0 = Loaded tape is not an ALP tape

1 = Loaded tape is an ALP tape

ALP_C

ALP Capable

0 = Drive is not capable of ALP

1 = Drive is capable of ALP

ALP Write Mask

Bit map for ALPs 0-511(T10000B) or 0-1023 (T10000C). ALP 0 is bit 7, byte 6

ALP Errata Sheet

0b = ALP write not allowed

1b = ALP write allowed

ALP Linkage Report

Two bytes are used to report the linkage of each ALP. Bytes 70-71(T10000B) or bytes 134-135 (T10000C) report linkage of ALP 0.

XXXXh = This ALP is forward linked to ALP XXXXh

FFFCh = ALP blank

FFFDh = ALP link unknown

FFFEh = ALP not used

FFFFh = ALP not linked

ALP Lock Mask

Bit map for ALPs 0-1023. ALP 0 is bit 7, byte 2182

0b = ALP not locked

1b = ALP locked

3.4 Mode Select Command

The following changes apply to Mode Select data.

3.4.1 ALP Control Mode Page

Mode select page 11h, subpage E0h controls ALP operations.

Table 3. Mode Select ALP Control mode page – T10000B

Byte	Bit								
	7	6	5	4	3	2	1	0	
0	PS (0)	SPF (1)	Page Code (11h)						
1	Subpage Code (E0h)								
2 - 3	Page Length (0442h)								
4	Reserved			LINKS	W_MSK	RSVD	ALP_T	ALP_C	
5	Reserved								
6-69	ALP Write Mask								
70-1093	ALP Linkage Report								

Table 4. Mode Select ALP Control mode page – T10000C

Byte	Bit								
	7	6	5	4	3	2	1	0	
0	PS (0)	SPF (1)	Page Code (11h)						

ALP Errata Sheet

1	Subpage Code (E0h)				
2 - 3	Page Length (0902h)				
4	Reserved	LINKS	W_MSK	L_MSK	ALP_T ALP_C
5	Reserved				
6-133	ALP Write Mask				
134 - 2181	ALP Linkage Report				
2182 - 2309	ALP Lock Mask				

LINKS

Linkage Report Valid

0 = ALP Linkage Report data is not valid

W_MSK

Write Mask

0 = Write mask not valid

1 = Write mask valid

L_MSK

Lock Mask valid

0 = Lock mask is not valid

1 = Lock mask is valid

ALP_T

ALP Tape

0 = Make tape a non ALP tape (not allowed on T10000C)

1 = Make tape an ALP tape

ALP_C

ALP Capable (this field is ignored)

ALP Write Mask

Bit map for ALPs 0-511(T10000B) or 0-1023 (T10000C). ALP 0 is bit 7, byte 6

0b = Write not allowed in ALP

1b = Write allowed in ALP

ALP Linkage Report

Two bytes are used to report the linkage of each ALP. Bytes 70-71(T10000B) or bytes 134-135 (T10000C) report linkage of ALP 0.

XXXXh = This ALP is forward linked to ALP XXXXh

FFFCh = ALP blank

FFFDh = ALP link unknown

ALP Errata Sheet

FFFEh = ALP not used
FFFFh = ALP not linked

ALP Lock Mask

Bit map for ALPs 0-1023. ALP 0 is bit 7, byte 2182

0b = ALP not locked
1b = ALP locked

ALP Errata Sheet

3.5 Format Medium Command

Add "Format Medium 04h SSC-3" to - Table Supported SCSI Commands.

3.5.1 Format Medium Command

This vendor unique Format Medium command is used to start a new ALP logical volume. The command must be issued only after positioning the tape to the beginning of an ALP. After this Format Medium command is processed, writes will start a block id 0.

Table 5. Format Medium Command

Byte	Bit							
	7	6	5	4	3	2	1	0
0	Page Code (04h)							
1	Reserved						Verify	Immed
2	Reserved				Format			
3-4	Transfer Length							
5	RSVD	ALP	Control Byte					

Verify

0 = Do not verify format operation

Immed

Immediate

0 = Return status after format completes

Format

8h = Vendor unique - start new ALP logical volume

Transfer Length

0000h = No data is transferred for format medium command

ALP

1 = Start new ALP logical volume

3.6 Locate Command

ALP Errata Sheet

This vendor unique version of the Locate command is used to locate to the start of an ALP.

Table 6. Locate Command

Byte	Bit							
	7	6	5	4	3	2	1	0
0	Page Code (2Bh)							
1	Reserved					BT	CP	Immed
2	Reserved							
3-6	Block Address							
7	Reserved or ALP MSB							
8	ALP LSB							
9	RSVD	ALP	Control Byte					

BT

Block Address Type

- 0 = SCSI Logical block address
- 1 = Vendor specific (ignored)

CP

Change Partition

- 0 = Ignore partition field
- 1 = Change partition (required for ALP locate)

Immed

Immediate

- 0 = Return status after locate is complete (required for ALP locate)
- 1 = Return status when locate started

Block Address

Logical block address position (must be zero for ALP locate)

Partition

ALP index - vendor unique

ALP

Locate ALP

- 0 = normal locate block id
- 1 = vendor unique ALP locate

3.7 Read Position Command

This vendor unique version of the Read Position command is used to read to the current ALP index.

ALP Errata Sheet

Table 7. Read Position Command

Byte	Bit							
	7	6	5	4	3	2	1	0
0	Page Code (34h)							
1	Reserved					TCLP	LONG	BT
2-6	Reserved							
7-8	Allocation Length							
9	PPI	ALP	Control Byte					

TCLP

Total Current Logical Position

0 = Return first and last block location

LONG

Long Format

0 = Return 20 bytes of data

1 = Return 32 bytes of data (PPI only)

BT

Block address Type

0 = SCSI logical block address

1 = Vendor specific (ignored)

Allocation Length

0000h = 20 bytes returned (PPI returns 32 bytes)

PPI

Physical Position Indicator

0 = Normal read position

1 = Read physical position indicator data

ALP

ALP vendor unique read position

0 = Normal read position

1 = Read ALP index

Table 8. Read Position Data

Byte	Bit
------	-----

ALP Errata Sheet

	7	6	5	4	3	2	1	0
0	BOP	EOP	BCU	BYCU	RSVD	BPU	PERR	RSVD
1	Partition or ALP Index MSB							
2	Reserved or ALP Index LSB							
4-7	First Block Location							
8-11	Last Block Location							
12	Reserved							
13-15	Number of Blocks in Buffer							
16-19	Number of Bytes in Buffer							

Partition

Partition Number

00h = Only partition supported (regular read position)

ALP Index

Current ALP index – two bytes (ALP only)

3.8 Request Sense Command

The Request Sense command table of Sense Key with ASC and ASCQ requires the following additions;

3.8.1 Sense Key with ASC and ASCQ

Key	12	13	Description
5	30	05	Cannot write – incompatible format
5	3B	0C	Position past beginning of partition
5	3C	00	Command sequence error

*** END OF DOCUMENT ***