TO: T10 Membership, ADI Working Group
FROM: Rod Wideman, ADIC; rod.wideman@adic.com
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SUBJECT: ADI Very High Frequency Log Page (document T10/02-489r0)

This document proposes an update to the Very High Frequency log page that was originally described in T10/02-097r1 and T10/02-180r0 and voted for inclusion in ADC (project T10/1558-D). The update is based on development of a state transition model, as put forth in T10/02-257r1, as well as previous changes agreed to as documented in meeting minutes of the ADI working group.

Very High Frequency Data Log Page

The goal of this log page is to define the most critical information that is needed the most frequently during normal operation such that it can be as concise and condensed as possible for performance. It returns a single log parameter, the Very High Frequency Data. Values returned reflect the last known since the drive having become initialized. In addition to indication of drive initialization, reliance on returned values should take into consideration conditions indicated by changes in Tape Alert flag status, and process those first as needed.

The Very High Frequency Data log page is shown in Figure 1.

Bit / Byte	7	6	5	4	3	2	1	0
0	Reserved		Page Code = ?					
1	Reserved							
2	Page Length = 08h							
3								
4	Parameter Code = 0000h (single parameter)							
5								
6	DU=0	DS=1	TSD=0	ETC=0	TMC=0		LBIN=1	LP=1
7	Parameter Length = 04h							
8	Very High Frequency Data Log Parameter							
11								

Figure 1 Very High Frequency Data Log Page

The Very High Frequency Data log parameter is shown in Figure 2.

Bit / Byte	7	6	5	4	3	2	1	0
0	Rsvd	Rsvd	MAM Accessible	Compress	Write Protect	Clean Requested	Clean Required	Drive Initialized
1	In Transition	Rsvd	Robotic Access Allowed	Media Present	Hold Point	Media Seated	Media Threaded	Data Accessible
2	Tape Motion Status							
3	Rsvd	Rsvd	Rsvd	Rsvd	Rsvd	Recovery Requested	Interface Changed	TapeAlert Set

Figure 2 Very High Frequency Data Log Parameter

The fields are described below.

BYTE 0:
MAM Accessible – A value of 1 indicates that the media is located within the drive at a position where the Media Auxiliary Memory can be accessed. A value of 0 indicates that the MAM cannot be accessed. This field would only be valid for drives and media that support MAM. If supported, this field should only be set to 1 in conjunction with Media Present. This field may reflect a unique position within the drive that occurs prior to fully seating or threading the media. When set to 1, the drive should also support commands to access the MAM.

Compress – A value of 1 indicates that the drive currently has data compression enabled; a value of 0 indicates that it is not.

Write Protect – A value of 1 indicates that any currently present media is physically write protected; a value of 0 indicates that it is not. This field is only valid if Media Present is 1, and should be set to 0 when no media is present in the drive. "Physically write protected" refers to any mechanism used within the media shell itself to write protect the media, such as sliding windows or tabs, and not logical states of write protection issued by commands to the drive.

Clean Requested – A value of 1 indicates that the drive has requested a head cleaning; a value of 0 indicates that no cleaning is requested.

Clean Required – A value of 1 indicates that a head cleaning operation must be done before a data cartridge can be loaded, such that normal operation may not be possible. A value of 0 indicates that urgent cleaning is not required. This field shall take priority over Clean Requested. It shall not be considered an error for both fields to be set to 1 however.

Drive Initialized – A value of 1 indicates that the drive is ready for operation and that it is ready to support returning valid Very High Frequency data; a value of 0 indicates drive initialization is required or incomplete. This field should be monitored for a value of 1 before relying on any other fields in the Very High Frequency Data parameter.

BYTE 1:
In Transition – This field governs the remaining fields within this byte to indicate the stability of the values returned and whether activity relative to state transitions is taking place. A value of 1 indicates that the state currently reflected by the remaining fields in this byte is in transition, as the drive is attempting to go to another state. A value of 0 indicates that the drive is in the state reflected by the remaining fields in this byte and is making no attempt to leave this state.

Robotic Access Allowed – A value of 1 indicates that the library may move media to or from the drive. A value of 0 indicates that the library should not move media to or from the drive. The drive should indicate that access is allowed by the robotics if it is reasonably certain that media can be successfully inserted into or removed from the drive. This field is not intended to reflect the value of any Prevent/Allow Media Removal command settings, nor the ability of the library to issue commands to the drive.

Media Present – A value of 1 indicates that the drive detects the presence of media; a value of 0 indicates that the drive does not detect any media present. This would typically be a direct reflection of some type of hardware sensor.

Hold Point – A value of 1 indicates that the media is at an intermediate mechanical position fully within the drive, under control of the drive, but not yet ejected or seated. This is primarily reached following the completion of an unload sequence, prior to reaching the final ejected position. It may also be a position used during a load sequence that affords access to MAM or as a final staging point prior to seating the cartridge. A value of 0 indicates that the media is not at hold point.

Media Seated – A value of 1 indicates that the media is mechanically seated within the loading mechanism. This means that the physical loading process has completed. A value of 0 indicates that the media is not seated, and that further mechanical motion remains in order to complete the loading process (exclusive of tape threading).

Media Threaded – A value of 1 indicates that the media has been threaded by the drive, such that tape motion operations are possible. This may or may not correspond to the drive responding "Ready" to a SCSI Test Unit Ready command, as additional processing may be required by the drive after threading to achieve a SCSI "Ready" state.

Data Accessible – A value of 1 indicates that the drive has finished all processing for a load operation. It corresponds to the drive being able to respond "Ready" to a SCSI Test Unit Ready command. It is reset to 0 at the beginning of the next unload operation when the drive is no longer in the Ready state.

BYTE 2:
Tape Motion Status – This field describes the current activity of the tape itself as follows:

- 00h No tape motion in progress
- 01h Cleaning operation in progress
- 02h Firmware upgrade in progress
- 03h Tape is being loaded
- 04h Tape is being unloaded
- 05h Tape in motion
- 06h Reading
- 07h Writing
- 08h Locating
- 09h Rewinding
- 0Ah-7Fh Reserved
- 80h-FFh Vendor Unique status

BYTE 3:
Recovery Requested – A value of 1 indicates that the drive has a recovery procedure to recommend or request via the Requested Recovery log page. A value of 0 indicates that it does not. This field will remain set to 1 until no further recoveries are requested.

Interface Changed – A value of 1 indicates that interface status has changed since the last retrieval of the Interface Status log page. This field is reset to 0 after retrieval of the Interface Status log page.

TapeAlert Set – A value of 1 indicates that at least one TapeAlert flag has been set to 1 since the last retrieval of the TapeAlert flags. This field is reset to 0 after retrieval of the TapeAlert flags. This field does not indicate when TapeAlert flags are reset to 0. It is possible to not find any TapeAlert flags set to 1 upon retrieval if the condition changed between the time of reporting through this field and retrieving the actual flags. This should not be considered an error.

This field should be processed second, following the Drive Initialized field. Pending TapeAlert flags may affect the reliability of the values returned in other fields.

[Discussion item – We have said that TA flags retrieved through the ADI will not clear them for the primary interface (SSC device server), and vice versa. This is fine and consistent with using both an ADC and SSC device server model. However, if the flags are retrieved via ADI by making the request to the SSC device server, should they be cleared? I say yes, based on the notion that the separate device models provides flag preservation, and not the physical interface.]