**memorandum**

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T10/04-303r0

| To | From | Subject | Date |
|---|---|---|---|
| INCITS T10 Committee | Michael Banther, HP | ADC Redefinition of VHF Data DACC bit | 09 September, 2004 |

**Revision History**

Revision 0 – Initial proposal.

**Background**

In ADC letter ballot comment (03-385r4) HP-162, HP raised a concern with the definition of the DACC bit in the VHF Data Descriptor (ADCr06, 6.1.2.2). Subsequent edits have modified the text describing the DACC bit somewhat (ADCr06c, 6.1.2.2). However we remained concerned that the present definition does not match the intention of the working group. We believe that the mismatch will lead to developers unfamiliar with the working group discussions to implement the bit with behaviour unintended by the group.

**Analysis of the present text**

The present text (ADCr06c, 6.1.2.2) contains two sentences that define the meaning of the DACC bit values:

> *A data accessible (DACC) bit set to one indicates that the DT device has finished all processing for a load operation.*
>
> *A DACC bit set to zero indicates that the DT device has not finished all processing for a load operation.*

The text also contains a sentence that describes some possible responses of an RMC device server within a DT device to a TEST UNIT READY command when the ADC device server within that DT device reports DACC equal to one:

> *The DACC bit set to one may correspond to the RMC device server being able to respond to a TEST UNIT READY command with a status of GOOD, however when a cleaning or microcode image medium is loaded the RMC device server may respond to a TEST UNIT READY command with a CHECK CONDITON with the sense key set to NOT READY.*

Finally the text contains a sentence that states when the ADC device server will set the DACC bit to zero:

> *The DACC bit is set to zero at the beginning of the next unload operation when the DT device is no longer in the data accessible state.*

**Other relevant text**

Sub-clause 4.1.4 (ADCr06a) defines the states that may be reported in the very high frequency data log parameter in the DT Device Status log page during load and unload operations. This sub-clause includes two tables that mention the DACC bit. Table 1 indicates that DACC equals one in the Load Complete state (Load state i). Table 3 indicates that DACC equals one in the DT Device Ready state (Unload state a).

Table 1 defines the Load Complete state as stable, i.e., INXTN equals zero. It requires the Medium Present (MPRSNT), Medium Seated (MSTD), and Medium Threaded (MTHRD) bits, as well as DACC, to equal one, and it requires the Robotic Access Allowed (RAA) bit to equal zero. The text describing Load Complete states:

> *Load state (i) represents the completion of the load operation (e.g., the DT device being in the SCSI READY state, microcode image or cleaning medium loaded)*

Regarding VHF Data log parameters, Table 3 defines the DT Device Ready state as identical to the Load Complete state. The text describing DT Device Ready states:

> *Unload state (a) represents the initial DT device state prior to receiving a request to unload.*

**Deficiencies in the present text**

The name 'data accessible' implies that the DACC bit equals one when an application client can read data from the medium. The working group has stated that it wants DACC to equal one in two cases when an application client cannot read data from the medium:

a. During the movement of a cleaning medium over the heads, and
b. During autonomous reading by a DT device of a microcode image from an upgrade tape.

Stated a different way, prior to the most recent revision the text allows two readings of the meaning of the 'Load Complete' state. In one reading, the loading of a medium that inherently disallows the reading of data, such as cleaning and upgrade cartridges,

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results in the DT device never reaching the Load Complete state. Instead the DT device starts in DT Device Initialized, No Medium Present state and then works its way through the supported Load states up through and including Completing Load. It remains in Completing Load during the cleaning operation or whilst reading the microcode image, and it then works its way through the Unload states beginning with DT Device Rewinding concluding at an appropriate, stable Unload state. Even in the current text, the only statement that indicates a load operation on a cleaning or upgrade cartridge must reach Load Complete state comes in an example (in the definition of the Load Complete state, 4.1.4.1).

Without a definition of 'load operation', the phrase 'finished all processing for a load operation' doesn't state whether it applies only to a successful load operation or to every complete load operation.

The phrase 'finished all processing for a load operation' does not convey the restrictions required by the definition of the Load Complete state (ADCr06c, 4.1.4.1), i.e. DACC can equal one only when MPRSNT, MSTD, and MTHRD equal one.

**Proposed changes**

**3.1 Definitions**

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**3.1.x mounted:** the state of a volume (see SSC-3) when the device is physically capable of processing commands or internal operations that cause the movement of the medium. A volume is de-mounted when it is seating, threading, positioning to the usable area of the medium, unthreading, unseating, or when not attached to the device.

**4.1.4.1 Load states**

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**Table 1 — Load states**

| Load state | Very high frequency data log parameter field | | | | | |
|---|---|---|---|---|---|---|
| | INTXN | RAA | MPRSNT | MSTD | MTHRD | MOUNTED |
| a) DT device initialized, no medium present | 0 | 1 | 0 | 0 | 0 | 0 |
| b) Early detection of medium placement by DT device | 0 | 1 | 1 | 0 | 0 | 0 |
| c) Acknowledgement of medium control by DT device | 0 | 0 | 1 | 0 | 0 | 0 |
| d) Medium seating | 1 | 0 | 1 | 0 | 0 | 0 |
| e) Medium seated | 0 | 0 | 1 | 1 | 0 | 0 |
| f) Medium threading | 1 | 0 | 1 | 1 | 0 | 0 |
| g) Medium threaded | 0 | 0 | 1 | 1 | 1 | 0 |
| h) Completing load | 1 | 0 | 1 | 1 | 1 | 0 |
| i) Load complete (e.g., DT device ready) | 0 | 0 | 1 | 1 | 1 | 1 |

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Load state (i) represents completion of the load operation such that the volume is mounted.

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### 6.1.2.2 Very high frequency data log parameter

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A mounted (MOUNTED) bit set to one indicates that the DT device is in load state (i) (see 4.2.4.1). The MOUNTED bit set to one may correspond to the RMC device server being able to respond to a TEST UNIT READY command with a status of GOOD, however when a cleaning or microcode image medium is loaded the RMC device server may respond to a TEST UNIT READY command with a CHECK CONDITON with the sense key set to NOT READY. A MOUNTED bit set to zero indicates that the DT device is not in load state (i).