TO: T10 Membership, ADI Working Group
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SUBJECT: ADI ADC State Transition Table Informative (document T10/03-042r0)

Introduction

This document is a follow-up to T10/02-257r1 that presents a state diagram example showing the values of the fields in the Very High Frequency polling frame. Discussion of that document resulted in an action item to show the *In Transition* field in the table, as well as develop narrative text to present the information suitable for inclusion in ADC. This proposal addresses that action item.

The proposed text would be placed in the *Automation drive interface device model* section, which is section 4.2 in the current ADC draft revision (0.2) (final section numbering is subject to change as the ADC draft continues development).

Discussion: Would this be better suited in the VHF Log Page instead? That would avoid having to explain what the state fields are, and avoid a forward reference (which seems awkward). I'm partial to that placement instead, but I recall the original discussion placing this in the device model section.

4.2.1.1   Very High Frequency State Fields Example

Table 1 and Table 2 together present an example Load and Unload sequence to show how the state fields might be reported in the Very High Frequency data during those operations. Automation devices rely on this information to coordinate handling of the media into and out of the drive, as well as to provide activity status back to users of the system. Many states in the sequences do not change while a transition or series of transitions is taking place, since the state they represent is not affected.

Table 1 Very High Frequency State Fields Load Example

Load Sequence Event	In Transition	Robotic Access Allowed	Media Present	Hold Point	Media Seated	Media Threaded	Data Accessible
01) Drive initialized, no media present	0	1	0	0	0	0	0
02) Initial media placement into drive	0	1	1[a]	0	0	0	0
03) After media "push" by automation	0	0	1	0[a]	0	0	0
04) Initial mechanical load by drive	1	0	1	0[a]	0	0	0
05) After initial mechanical drive load	0	0	1	1[a]	0	0	0
06) Final mechanical load by drive (seating)	1	0	1	0	0	0	0
07) After final mechanical drive load (seated)	0	0	1	0	1	0	0
08) Media threading	1	0	1	0	1	0	0
09) Media threaded	0	0	1	0	1	1	0
10) Load complete (drive ready)	0	0	1	0	1	1	1
11) *Various drive usage activity (reads, writes)*	0	0	1	0	1	1	1
[a] Could be 0 or 1 depending on drive capability. Preferred value shown.							

The load sequence begins with the drive initialized, no media present and robotic access allowed (1). The automation device then places media into the drive, which ideally is recognized by the drive as early as possible (2). After the initial placement, the automation device typically pushes the media into the drive, until the drive can take over the loading process (3). When the drive takes over the loading process, it

continues to draw the media in until reaching the farthest point inside (4, 5). After reaching this point, the drive then concludes the media movement by seating the media on some type of physical registration feature, as well as the tape reel gear(s) (6,7). Depending on the drive technology, one or more of the previous steps may be combined or eliminated, due to whether the drive provides any assistance for media loading.

Once seated, the media is threaded to prepare it for access by the read/write head (8,9). Any remaining actions taken by the drive are then completed, and the load sequence is complete, with the drive in the data accessible state (SCSI Ready) (10). One loaded, the media is then used by the application (11).

Table 2 Very High Frequency State Fields Unload Example

Unload Sequence Event	In Transition	Robotic Access Allowed	Media Present	Hold Point	Media Seated	Media Threaded	Data Accessible
01) *Various drive usage activity (reads, writes)*	0	0	1	0	1	1	1
02) Drive receives unload command, starts rewind and unthread	1	0	1	0	1	1	0
03) Media unthreaded	0	0	1	0	1	0	0
04) Initial mechanical unload by drive (unseating)	1	0	1	0	0	0	0
05) After initial mechanical drive unload (unseated)	0	0	1	0	0	0	0
06) Secondary mechanical unload by drive (to hold point)	1	0	1	0	0	0	0
07) Drive unloaded to hold point	0	0	1	1	0	0	0
08) Request to eject from automation, final mechanical drive unload	1	0	1	0	0	0	0
09) Media in ejected position	0	1	1[a]	0	0	0	0
10) Media retrieved from drive by automation, drive empty	0	1	0	0	0	0	0
[a] Could be 0 or 1 depending on drive capability. Preferred value shown.							

The unload sequence is prefaced with the drive loaded, and the application finishing its use of the media (1). It then begins when the drive receives a command to unload, and starts to rewind and then unthread the media (2, 3). Once the media is unthreaded, the drive begins the process of physically moving the media out, first by unseating it from its registration and tape reel engagement points (4,5). Once the media is unseated, the drive carries the media to a holding point that is still within the confines of the drive, so as to not interfere with any passing automation device (6,7). When the media is at the hold point, the automation device will request that the drive release the media to the ejected position (8,9). The automation device may position itself in front of the drive before making this request. With the media in the ejected position, the automation device can now retrieve it, leaving the drive empty and ready to begin the next load sequence.