TO: T10 Membership, ADI Working Group
FROM: Rod Wideman, ADIC; rod.wideman@adic.com
DATE: June 18, 2003
SUBJECT: ADI ADC Proposed Tape Alert Changes (document T10/03-212r2)

Revision History
Rev2

- Incorporated editorial comments from Michael Banther

Rev1

- Removed wording that specified RMC device server behavior
- Clarified meaning of behavior across port logins
- Moved description of behavior across power cycles to body text, converted to "shall"
- Moved reset state table to model section
- Changed title of reset conditions to reflect additional conditions beyond a power cycle
- Added definitions in body text of "start of next media load" and "after service resolution"
- Added additional reset conditions for a few state flags

Rev0

- Initial draft

Introduction
This document proposes changing the Tape Alert flags as reported by the ADC device server to reflect states instead of events. This change affects multiple sections within ADC.

Overview of Proposed Changes

- Define section 4.2.6 to cover model of flags reflecting states instead of events, application client is responsible for tracking which states it has seen, independence of ADC state flags from RMC device server.
- Change the description in VHF Data for the TAFS field to indicate TAF changed (zero to one, one to zero).
- Rename to "TapeAlert flag" to "TapeAlert state flag" to differentiate between legacy and new.
- Change the TapeAlert Response log page to reflect states instead of events. Indicate that the state flags are not consumed upon retrieval.
- Add modified version of TapeAlert table into TapeAlert Response log page that has column to describe clearing effects (events such as load of medium, receipt of command, etc.).

Proposed Changes

[This section all new]
4.2.6 Tape Alert application client interface
The ADC device server supports a modified version of TapeAlert specified in SSC-2. As supported by the ADC device server, the TapeAlert flags represent states, and the state flags are not reset to zero upon retrieval of the TapeAlert Response log page. Instead, the state flags are reset to zero upon a

change of the condition involved with the state (see table 5). The ADC device server also provides a mechanism to notify an ADC application client whenever a state flag changes value (see 6.1.2.1).

This approach facilitates accurate reporting of the conditions encountered by the DTD and allows the automation to manage the information directly. The ADC device server does not maintain unique TapeAlert information for each application client, and the state flags are not affected by port logins.

As such, the application client is responsible for determining which flags have changed state upon subsequent retrieval of the TapeAlert Response log page, which requires the application client to maintain at least one previously retrieved TapeAlert Response log page in order to detect differences. The application client may maintain a state change history as desired.

In conjunction with the VHF Data (see 6.1.2.1), the TapeAlert state flags are a primary source of information about the DTD, and should be used to obtain DTD status information. Application clients may retrieve TapeAlert state flags at any time; application clients should retrieve TapeAlert state flags when the ADC device server sets the TapeAlert Flags Changed (TAFC) field in the VHF data.

The ADC device server shall maintain the TapeAlert state flags independent of the TapeAlert flags maintained by the RMC device server. Retrieving the state flags from the ADC device server shall not reset the state flags maintained by the ADC device server and shall not reset the TapeAlert flags maintained by the RMC device server. Retrieving TapeAlert flags from the RMC device server shall not reset the state flags maintained by the ADC device server.

The TapeAlert state flags shall be cleared upon a power cycle of the data transfer device. The state flags will be reported as new states following the power cycle as conditions warrant. In addition to a power cycle, other conditions and events that reset state flags are described in table 5.

Table 5 – Additional TapeAlert state flag reset conditions

Flag	Name	Additional reset condition
01h	Read warning	Start of next media load
02h	Write warning	Start of next media load
03h	Hard error	Start of next media load
04h	Media	Start of next media load
05h	Read failure	Start of next media load
06h	Write failure	Start of next media load
07h	Media life	Start of next media load
08h	Not data grade	Start of next media load
09h	Write protect	Start of next media load or removal of write protect
0Ah	No removal	After media removal allowed
0Bh	Cleaning media	Start of next media load
0Ch	Unsupported format	Start of next media load or format change
0Dh	Recoverable mechanical cartridge failure	Start of next media load
0Eh	Unrecoverable mechanical cartridge failure	After service resolution
0Fh	Memory chip in cartridge failure	Start of next media load
10h	Forced eject	Start of next media load
11h	Read only format	Start of next media load or format change
12h	Tape directory corrupted on load	Start of next media load
13h	Nearing media life	Start of next media load
14h	Clean now	After successful cleaning or cause resolved
15h	Clean periodic	After successful cleaning
16h	Expired cleaning media	Start of next media load
17h	Invalid cleaning tape	Start of next media load
18h	Retension requested	After successful retension

Flag	Name	Additional reset condition
19h	Dual-port interface error	After interface returns to operation
1Ah	Cooling fan failure	After service resolution
1Bh	Power supply failure	After service resolution
1Ch	Power consumption	After power consumption returns to within specification
1Dh	Drive maintenance	After service resolution
1Eh	Hardware A	After service resolution
1Fh	Hardware B	After service resolution
20h	Interface	After interface returns to operation
21h	Eject media	Start of next media load
22h	Down-load fail	Start of next firmware download
23h	Drive humidity	After humidity returns to within specification
24h	Drive temperature	After temperature returns to within specification
25h	Drive voltage	After voltage returns to within specification
26h	Predictive failure	After service resolution
27h	Diagnostics required	After service resolution
28h-2Eh	Obsolete	
2Fh-31h	Reserved	
32h	Lost statistics	Start of next media load
33h	Tape directory invalid at unload	Start of next media load
34h	Tape system area write failure	Start of next media load
35h	Tape system area read failure	Start of next media load
36h	No start of data	Start of next media load
37h	Loading failure	Start of next media load
38h	Unrecoverable unload failure	After service resolution
39h	Automation interface failure	After service resolution
3Ah	Firmware failure	After service resolution
3Bh–40h	Reserved	

Many of the state flags are reset at the start of next media load. Starting with no media present, this is defined to be coincident with entering the next load state upon transition from load state (a) (see table 1). The next load state entered will vary by DTD. If a load sequence is initiated from an unload hold point (unload state (e) or (f) in table 3), start of next media load is defined to be coincident with entering the next load state upon transition from load states (c) or (e) (see table 1).

Other state flags are reset following resolution through service intervention. Service resolution may involve support from the manufacturer or manual intervention by the user, and is beyond the scope of this specification.

[This section changed]
Section 6.1.2.1, table 11: Byte 11, bit 0 change "TAFS" to "TAFC". Change the field description:

[old text]
A value of one in the TapeAlert flag set (TAFS) field indicates that at least one TapeAlert flag has been set to one since the last retrieval of the TapeAlert flags. This field is reset to zero after retrieval of the TapeAlert Response log page. This field does not indicate when TapeAlert flags are reset to zero. It is

possible to not find any TapeAlert flags set to one 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.

NOTE 7 This field should be processed following the DINIT field. Pending TapeAlert flags may affect the reliability of the values returned in other fields.

[proposed text]
A value of one in the TapeAlert state flag changed (TAFC) field indicates that at least one TapeAlert state flag has changed from its previous value since the last retrieval of the TapeAlert state flags. The ADC device server resets this field to zero after retrieval of the TapeAlert Response log page. It is possible to not find any difference in the TapeAlert state flags upon retrieval if the state changed again between the time of reporting through this field and retrieving the actual state flags. This should not be considered an error.

NOTE 7 This field should be processed following the DINIT field. Pending TapeAlert state flags may affect the reliability of the values returned in other fields.

[This section changed]
6.1.3 TapeAlert Response log page

[old text]
Table 14 describes the TapeAlert Response log page. The parameter fields represent the various TapeAlert flags (see SSC-2 for a description of TapeAlert and a definition of the flags).

The TapeAlert flags shall be maintained independently by the ADC device server from the flags maintained by the RMC device server. Retrieving the flags from the ADC device server shall only reset those flags maintained by the ADC device server and shall not reset the flags maintained by the RMC device server. Retrieving flags from the RMC device server shall only reset those flags maintained by the RMC device server and shall not reset the flags maintained by the ADC device server.

[proposed text]
Table 14 describes the TapeAlert Response log page. The parameter fields represent the various TapeAlert state flags (see SSC-2 for a description of TapeAlert and a definition of the flags). See table 5 in clause 4.2.6 for a description of the corresponding TapeAlert state flags and the conditions that reset each state flag to zero.

[second paragraph removed (now available in 4.2.6)]