

**X3T13/D96125R0**

## **Vendor Specific And Optional Proposal**

**To: X3T13 Technical committee**  
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**Date: 22 February 1996**  
**Subj: Proposal for changing some Vendor Specific and  
Optional items in ATA-4**

### **Introduction:**

Much concern has been expressed about the number of items that are designated "vendor specific" or "optional" in ATA-3. Users can not depend on these items to be consistent from vendor to vendor, from product to product from a particular vendor, or even to be implemented at all. Therefore, in many cases, "vendor specific" or "optional" designate items that are virtually meaningless to anyone using this specification. The following document reviews many of the occurrences of "vendor specific" and "optional" in ATA-3 and proposes changes for several of those items for inclusion in the ATA-4 draft specification. The goal of this proposal is that, where possible, items that are currently designated as vendor specific or optional should be redefined to be something non-vendor specific and non-optional upon which all can agree, or the items should be made to be obsolete or deleted from the specification.

### 1) Table 4 - Driver types and required pull-ups

In note 1 of this table there is a reference to "VS=vendor specific."

There are no "VS" items in the table. Therefore, this reference should be deleted.

### 2) 5.2.12 IORDY (I/O channel ready)

Paragraph 3: "The use of IORDY is required for PIO modes 3 and above and otherwise optional."

This sentence is unclear. Since this signal is typically implemented in hardware in the device and asserted as required regardless of mode, this sentence could be reworded to be, "A device shall utilize IORDY for PIO mode 3 and above, and may use IORDY for PIO mode 2 and below if the device requires extending the host transfer cycle at that mode. Hosts shall support IORDY."

### 3) 6.2.13 Status Register, Field/Bit Description, DRDY, b)

"If a device accepts commands other than EXECUTE DEVICE DIAGNOSTIC and INITIALIZE DEVICE PARAMETERS during the time the DRDY bit is equal to zero, the results are vendor specific."

At least the class of commands that may be accepted could be specified, e.g.: non-media access commands.

### 4) 6.2.13 Status Register, Field/Bit Description, DF

Sentence 2: "The internal status or internal conditions that causes this error to be indicated is vendor specific."

This bit should be made obsolete.

### 5) 6.2.13 Status Register, Field/Bit Description, CORR

Sentence 2: "The definition of what constitutes a correctable error is vendor specific."

This could be changed to: "A correctable data error requires additional time to process," or just be made obsolete.

### 6) 6.2.13 Status Register, Field/Bit Description, IDX

This bit should be made obsolete.

### 7) 7.2 Sector Addressing

Paragraph 1, sentence 2: "The mapping of logical sector addresses to the actual physical location of the data sector on the media is vendor specific."

This is absolutely true and won't change, but should there be some explanation about the history of why this is or an example of how this works?

**8) 7.3 Power management feature set**

Paragraph 2: "Additional vendor specific commands and functions are allowed."

This sentence is true for almost every function and feature in the specification. This sentence should be deleted.

**9) 7.3.2 Power management commands**

Paragraph 3, sentence 4: "The [power management] mode selected by the device [after receiving a reset] is based on the type of reset received and on [a] vendor specific implementation."

The specification should say: "A device shall return to the mode it was in before receiving the reset, unless the device was in the sleep mode. If the device was in the sleep mode when receiving a reset, it should return to the standby mode."

**10) 7.3.4. Idle mode transition**

"The transition to Idle mode is vendor specific and may occur as a result of an IDLE or IDLE IMMEDIATE command, or in vendor specific way."

With the exception of what is reported in the task file upon a CHECK POWER MODE command, the condition of a device being in the idle mode as it is defined in the specification is transparent to the host. This should be changed to: "If a device accepts the IDLE and IDLE IMMEDIATE commands, the device shall transition to the Idle mode after receipt of the command."

**11) 7.5 Security mode feature set**

A line should be included here like the Power Management Feature Set: "A device that implements the Security Mode Feature Set shall implement the following minimum set of functions:"

**12) 7.6.1 Attributes****13) 7.6.2 Attribute Thresholds****14) 7.6.3 Attribute Values****15) 7.6.4 Threshold Exceeded Condition**

The definitions for 12), 13), 14) and 15) listed above are rife with "vendor specific" -- to the point that inclusion of these definitions is confusing not enlightening.

Therefore, these sections should be deleted.

**16) 7.6.5 SMART commands**

This section should be updated to delete references to the deleted definitions and the commands that are recommended to be made obsolete. This section could be updated to read:

The SMART commands use a single command code and are differentiated by the value placed in the Features register. See Clause 8.31.

If the SMART feature set is implemented, the following commands shall be implemented.

- SMART ENABLE OPERATIONS
- SMART DISABLE OPERATIONS
- SMART RETURN STATUS
- SMART ENABLE/DISABLE ATTRIBUTE AUTOSAVE

#### **17) 7.6.6 SMART operation with power management modes**

This section should be updated to reflect the wording of the latest SFF-8035 document.

#### **18) 8.2 DOOR LOCK**

#### **19) 8.3 DOOR UNLOCK**

#### **20) 8.12 MEDIA EJECT**

These commands are part of the optional Removable Media Feature Set.

This command set should be described -- like the other optional feature sets -- in Section 7.4. If all removable media devices implement all three of these commands then it should be specified that they are mandatory if the command set is implemented

#### **21) 8.4 DOWNLOAD MICROCODE**

This command is defined as optional.

There will probably always be some devices that won't implement this command. However, a bit should be defined in the IDENTIFY DEVICE data that could inform the host if the command was implemented on a given device.

#### **22) 8.5 EXECUTE DEVICE DIAGNOSTIC**

255 possible values are given for diagnostic codes (see Table 8). All but 01h and 81h are listed as vendor specific: Device 0 passed and Device 1 passed or not present, and Device 0 passed and Device 1 failed.

Other diagnostic codes could be associated with other conditions, e.g.: Device 0 failed and Device 1 passed. Any remaining "vendor specific" diagnostic codes should be made "obsolete".

#### **23) 8.6 FORMAT TRACK**

This command should be made obsolete.

#### **24) IDENTIFY DEVICE, Table 9**

The following in the IDENTIFY DEVICE information should be converted from "Vendor specific" or "Vendor specific (obsolete)" to "Obsolete".

Word 0, bits 1-5 and 8-14  
Word 4

Word 5  
 Words 7-9  
 Word 20  
 Word 21  
 Word 47, bits 15-8  
 Word 49, bits 7-0  
 Word 51, bits 7-0  
 Word 52, bits 7-0

**25) 8.7.13 Word 23-26: Firmware revision**

“If word 23 of this field is 0000h, then the firmware revision is not specified and the definition of the remaining words of this field are vendor specific.”

There should only be two choices here. Either the device has its firmware revision in this field or the field is all zeros.

**26) 8.7.17.1 Standby timer support**

Sentence 3: “If bit 13 [of Word 49] is cleared to zero, the timer values utilized are vendor specific.”

This conflicts with the statement under INPUTS for the IDLE command: “The value in the Sector Count register ... *shall* determine the time period ... [the italics are mine].” Therefore the value of zero in this field should not be allowed. If devices implement the Power Management Feature Set, then they should implement the timer as specified.

**27) 8.7.22, .23, and .24, Notes 9, 10 and 11**

References to ATA-1 should be deleted in ATA-4.

**28) 8.8 IDENTIFY DEVICE DMA**

There will probably always be some devices that won't implement this command. However, a bit should be defined in the IDENTIFY DEVICE data that could inform the host if the command was implemented on a given device.

**29) 8.13 NOP**

This command should be made obsolete.

**30) 8.14 READ BUFFER**

There will probably always be some devices that won't implement this command. However, a bit should be defined in the IDENTIFY DEVICE data that could inform the host if the command was implemented on a given device.

**31) 8.15, 8.18, 8.19, 8.35 and 8.38, READ and WRITE commands with retries**

The last sentence in each of these command descriptions is: "Error recovery performed by the device either with or without retries is vendor specific."

Unless we can define the difference in the levels of error correction, the commands with retries should be made obsolete. The command codes could be given the same meaning as the command codes for the commands without retries. It is interesting to note that there are not commands with and without retries for the READ and WRITE MULTIPLE commands.

**32) 8.16 READ LONG**

This is so filled with vendor specific elements that we ought to make good on the threat in Note 21 and make this command be obsolete.

**33) 8.20 RECALIBRATE**

If we can't agree on at least some of the functions for this command it should be made obsolete.

**34) 8.27 SEEK**

The ERROR OUTPUTS and DESCRIPTION are both vendor specific.

We should agree on specifically what this command does or make it be obsolete.

**35) 8.28 SET FEATURES**

DESCRIPTION, Paragraph 2: "At power on, or after a hardware reset, the default setting of the functions specified by the subcommands are vendor specific."

A place to report the default settings should be allocated in the IDENTIFY DEVICE information for any commands that we decide to keep in ATA-4.

**36) 8.28.1 Enable/disable write cache**

These subcommands should be made mandatory and work so that they completely enable and disable write cache. When the subcommand to disable write cache is issued, the device should flush cache to non-volatile memory before posting command complete.

**37) 8.28.3 Enable/disable automatic defect reassignment**

This subcommand should be made obsolete.

**38) 8.28.4 Enable/disable retries**

This subcommand should be made obsolete.

**39) 8.28.5 Vendor specific data appended**

“Subcommand code 44h allows the host to set the number of data bytes appended to the data transfer on READ LONG and WRITE LONG commands to the value set in the Sector Count register. Subcommand code BBh sets the number of data bytes appended to the data transfer on READ LONG and WRITE LONG commands to four bytes.”

When we obsolete READ & WRITE LONG we can obsolete these subcommands, as well.

**40) 8.28.6 Set cache segments****41) 8.28.7 Enable/disable read look-ahead**

These commands should be made obsolete.

**42) 8.28.8 Enable/disable reverting to defaults (optional)**

“Subcommand codes CCh and 66h allow the host to enable or disable the device from reverting to power on default values. A setting of 66h allows settings of greater than 80h which may have been modified since power on to remain at the same setting after a software reset.”

This subcommand should be made obsolete.

**43) 8.28.9 Enable/disable ECC (optional)**

In today’s devices, much of this is handled in hardware and is not able to be disabled. If the intent is to minimize performance impact, this could be redefined as disabling any non-hardware ECC that might impact performance (though this is vague). Otherwise this should be made obsolete.

**44) 8.28.10 Set device current (optional)****45) 8.28.11 Set maximum prefetch**

These subcommand should be made obsolete.

**46) 8.30 SLEEP**

DESCRIPTION, Paragraph 2: “Because some host systems may not read the Status register and clear the interrupt, a device may automatically deassert INTRQ and enter Sleep mode after a vendor specific time period of not less than 2 s.”

This should be rephrased to be “...after a time period of not less than 2 s.”

**47) 8.31.4 SMART READ ATTRIBUTE THRESHOLDS****48) 8.31.5 SMART READ ATTRIBUTE VALUES****49) 8.31.7 SMART SAVE ATTRIBUTE VALUES**

The commands listed above contain so many vendor specific items that inclusion of these commands is confusing not enlightening. Therefore, these commands should be made obsolete.

**50) 8.34 WRITE BUFFER**

There will probably always be some devices that won't implement this command. However, a bit should be defined in the IDENTIFY DEVICE data that could inform the host if the command was implemented on a given device.

**51) 8.36 WRITE LONG**

This is so filled with vendor specific elements that we ought to make good on the threat in Note 22 and make this command be obsolete.

**52) 8.39 WRITE VERIFY**

There will probably always be some devices that won't implement this command. However, there should be a bit defined in the IDENTIFY DEVICE data that could inform the host if the command was implemented on a given device.

**53) 9.1.1 Power on and hardware resets - device 1****54) 9.2.2 Software resets - device 1**

Sentence 3 in item j) in 9.1.1 and item i) in 9.2.2: "Device 1 shall clear the BSY bit, optionally assert PDIAG-..."

I think what is meant here is: "Device 1 shall clear the BSY bit, assert PDIAG- if device 1 has passed its diagnostics..." or possible "Device 1 shall clear the BSY bit, assert PDIAG- as required..."