

## Multiword DMA Description Proposal

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In view of the reflector traffic on Multiword DMA, I propose that the following be added to Clause 6 of ATA/ATAPI-5. I have modified it from rev 0 with the points that Hale raised on the reflector.

### 6.x Multiword DMA

Multiword DMA is a data transfer protocol used with the READ DMA, WRITE DMA, READ DMA QUEUED, WRITE DMA QUEUED, and PACKET commands. When a Multiword DMA transfer mode has been set via the SET FEATURES 03h subcommand, this data transfer protocol shall be used for the data transfers associated with these commands. Signal timing for this protocol is described in 10.2.3.

The DMARQ and DMACK- signals are used to signify when a Multiword DMA transfer is to be executed. The DMARQ and DMACK- signals are also used to flow control a Multiword DMA data transfer.

When a device is ready to transfer data associated with a Multiword DMA transfer, the device shall assert DMARQ. The host shall then respond by asserting DMACK-, negating CS0- and CS1-, and begin the data transfer by asserting, then negating, DIOW- or DIOR- for each word transferred. The host shall not assert DMACK- until DMARQ has been asserted by the device shall transfer data only when both DMARQ and DMACK- are asserted. Having asserted DMARQ and DMACK-, these signals shall remain asserted until at least one word of data has been transferred.

The device may pause the transfer for flow control purposes by negating DMARQ. The host shall negate DMACK- in response to the negation of DMARQ. The device may then reassert DMARQ to continue the data transfer when the device ready to transfer more data and DMACK- has been negated by the host.

The host may pause the transfer for flow control purposes by either pausing the assertion of DIOW- or DIOR- pulses or by negating DMACK-. The device may leave DMARQ asserted in this case. The host may then reassert DMACK- when DMARQ is asserted and begin asserting DIOW- or DIOR- pulses to continue the data transfer.

When the Multiword DMA data transfer is complete, the device shall negate DMARQ and the host shall negate DMACK- in response.