Tech Info Library

SCSI Hard Disk Drives: Interleave Information (11/94)

Revised: 11/9/94
Security: Everyone

SCSI Hard Disk Drives: Interleave Information (11/94)

==========

Article Created: 2 March 1987
Article Reviewed/Updated: 09 November 1994

TOPIC ----------

This article pertains to the interleave of Apple external SCSI hard drives of all sizes.

DISCUSSION ----------

To initilaize a SCSI hard disk drive you want to use on a Macintosh:

1. Always use Apple HD SC Setup.

2. Always initialize from the type of Macintosh the drive will be connected to. For example, if you wish to connect a Apple HD40 SC to a Macintosh Plus, initialize that hard disk with a Macintosh Plus.

If you want more than one type of Macintosh to access the SCSI hard disk, always initialize it from the slowest system for the best average performance. You must do this because, with Apple HD SC Setup, different types of Macintosh computers require a SCSI hard disk with a different interleave.

Computer	Interleave	relative speed
Macintosh II and later	1:1	fast
Macintosh SE	2:1	medium
Macintosh Plus	3:1	slow
Apple II	3:1	slow

Interleave is the ratio of consecutive sectors a CPU can read from or write to. This means that a Macintosh II is fast enough to read from or write to every consecutive sector, a Macintosh SE can only read every other sector, and the Macintosh Plus is only fast enough to read one in every three sectors. An Apple

II also has an interleave of 3:1. The Apple II can support a 3:1 interleave because the SCSI card has a 8K RAM buffer enabling it to buffer data until the CPU is ready for it.

Delays occur when you connect a "slower" Macintosh to a hard disk initialized on a "faster" Macintosh. For example, a hard disk intialized from a Macintosh II has more data on every consecutive sector than a Macintosh Plus can consecutively read, necessitating a full revolution of the platter before the Macintosh Plus can access the sectors it knows it missed. There's a delay of the revolution of only one or two sectors when a "fast" Macintosh accesses a hard disk intialized from a "slower" Macintosh.

For the change in interleave ratio between the Macintosh Plus and the Macintosh SE, there are three reasons: improved performance, hardware handshaking, and changes in SCSI firmware. First, the Macintosh SE performs more quickly, even though it uses the Macintosh Plus' 68000 processor running at the same speed. The Macintosh SE has a change in hardware design that allows the video circuitry 1 long word access to the RAM for every 3 made by the processor, as opposed to the 1 video access for every 1 made by the processor on previous Macintoshes. Next, hardware handshaking was implemented, allowing cleaner and faster communication between the Macintosh SE and the drive. Finally, the SCSI firmware was cleaned up and optimized for the SE. Previous bugs and patches caused the SCSI driver to not perform as quickly as it should.

Article Change History:
09 Nov 1994 - Reviewed for technical accuracy, revised formatting.

Support Information Services

Tech Info Library Article Number:2154