The following identifies all the changes since Rev 3 was created, and includes editorial items caught in the translation to Japanese (supplied to me by the delegation from Japan at the ISO SC13 meeting in Copenhagen).

5.2 Control Signals Drivers and Receivers.
The drivers have the following ......
The signals are driven with an open collector output stage capable of sinking at least 40mA when asserted with maximum voltage of 6V or 0.5V measured at the driver. When the line driver is negated the driver transistor is off and collector leakage current is a maximum of 250uA.

5.4.1 Write Gate Termination.
This line shall be protected ......

*1 Part of terminator pack in last drive of the daisy chain.
*2 Permanently located in the drive. Voltage drop shall be <0.75V with a Forward Current of <=1mA.

FIGURE 3: WRITE GATE TERMINATION

TABLE 6: SUMMARY OF DEFINED COMMANDS FOR ALL DEVICES

<table>
<thead>
<tr>
<th>Command</th>
<th>Optical Disk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnetic Disk</td>
<td>Track Offset</td>
</tr>
<tr>
<td>Seek</td>
<td></td>
</tr>
<tr>
<td>Init Diagnostics</td>
<td>Init Diagnostics</td>
</tr>
<tr>
<td>Set BS/Net Selector</td>
<td>Reserved</td>
</tr>
<tr>
<td>Set BS/Net Selector</td>
<td>Set BS/Net Selector</td>
</tr>
<tr>
<td>Set High Order Value</td>
<td>Set High Order Value</td>
</tr>
</tbody>
</table>

TABLE 7: MAGNETIC DISK COMMAND (CMC) DATA DEFINITION

<table>
<thead>
<tr>
<th>CMD</th>
<th>CMD Function</th>
<th>Modifier Applicable</th>
<th>Subscript Applicable</th>
<th>Parameter Applicable</th>
<th>Status/Config Data to Ctrl</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Seek</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1901</td>
<td>Set BS/Net Selector</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1001</td>
<td>Set Unfr'd Bytes/Scrpt</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1010</td>
<td>Set High Order Value</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

7.6.1.1.1 Synchronized Spindles.
In a synchronized spindle .......... ATTENTION shall be asserted whenever there is a change from the synchronized condition (bit 11=1) to the unsynchronized condition (bit 11=0).
### TABLE 19: OPTICAL DISK GENERAL CONFIGURATION RESPONSE BITS

<table>
<thead>
<tr>
<th>Command Modifier Bits 11-8</th>
<th>Subscript 7-0</th>
<th>Configuration Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0 0 0 1</td>
<td>4</td>
<td>General Configuration of Drive and Format</td>
</tr>
<tr>
<td>1</td>
<td>= Not Magnetic Disk</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>= Head Switch Time &gt; 15 usec</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>= Not NRZ</td>
<td></td>
</tr>
</tbody>
</table>

#### 7.18 Synchronized Drives.

The controller may use Set Configuration with synchronized drives to set the selected drive to act as master (7-0 = x'01') or as slave to another drive (7-0 = x'00').

**If set to Master Control (7-0 = x'03'), the drive shall generate the Master Sync signal and also respond to the Slave Sync signal received from another source.**

A synchronized drive may be set to unsynchronized operation (7-0 = x'02').

#### 7.18.3 Synchronized Sector Offset

When set to a offset value is other than zero, the drive shall offset its position by one quarter rotation beyond that of the master behind the Slave Sync signal. A drive designated as Master shall reject this command.

---

The ISG Bytes after Index/Sector Pulse field in Configuration Data Word 7 (for Command Modifier 0111) bits 15-8 is not used if subscripts 17-18 are implemented. This byte should be implemented to support controllers which do not implement subscripts 17-18.

---

ESDI Editing Changes between Rev 3 January 19 and Rev 3C October 20
TABLE 30: SET CONFIGURATION SOFT SWITCH PARAMETER BITS

<table>
<thead>
<tr>
<th>CMD Function</th>
<th>Switch No</th>
<th>Switch Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>12</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>P</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Set Synchronized Drive
- 11000000 = Slave
- 11000001 = Master
- 11000011 = Master Control
- 00000010 = Unsynchronize

Notched Drive Zone Number

8.1.1 Read Initialization Time.

The time lapse before READ GATE or ADDRESS MARK ENABLE can be asserted after
a head switch is (0.7 x ISG) or according to the value provided in Request
General Configuration subscripts (see Table 17). Drives not able to meet a
15 usec head switching time shall negate COMMAND COMPLETE upon a head
switch.

8.2.5 Write-to-Read Recovery Time.

The time lapse before READ GATE or ADDRESS MARK ENABLE can be asserted after
negating the WRITE GATE is defined by the subscripted value provided in
subscript 18 of Request General Configuration, or if subscripts are not
supported, the ISG Bytes after Index/Sector pulse in Configuration Data
Response word 7 (for Command Modifier 011).

8.3.2 Intersector Gap (ISG).

The minimum

- Drive required write-to-read recovery time (the minimum time between
  negation of WRITE GATE and assertion of READ GATE or ADDRESS MARK ENABLE
  which is specified in the "Write-to-Read Recovery Time" subscript, or
  if subscripts are not supported, by the "ISG Bytes after Index/Sector" in
  Configuration Data Response. See 7.7.1.8).

8.3.3.1 PLO Sync Field.

These bytes are required by the drive to allow the drive's read-data phase-
locked oscillator to become phase and frequency synchronized with the data
bits recorded on the media. The controller shall send a bit string of zeros
during this time.

8.3.3.5 ADR Pad - (ID Pad).

The ID Pad (two bytes minimum) shall be written by the controller and are
required by the drive to ensure proper recording and recovery of the last
bits of the address field check code: ADR Check Bytes. These pad bytes shall be
zeros.

8.4.4 Intersector Gap (ISG) Speed Tolerance and Format Speed Tolerance Gap.

The ISG is included in the format to allow for all those items discussed in
8.3.2. In addition it shall also account for any required intersector speed
tolerance. It required

There may also be an additional ISG at the a Format Speed Tolerance Gap which
extends the ISG at the end of the track if required. This gap is written
during a format and is used as a filler and to allow for speed

\[ + \text{Inter Sector Gap} \]
\[ + \text{PLO Sync Bytes} \]
\[ + \text{Sync Pattern} \]
\[ * \text{Nbyte Format Speed Tolerance Gap} + \]

FIGURE 21: FIXED SECTOR OPTICAL FORMAT

9.2.2 Detection and Resynchronization.

In normal operation, the ATTENTION

It is also possible for the ATTENTION line to be asserted (Figure 42:
Communications Fault) when the controller is attempting to communicate with
the drive (i.e. when the controller attempts to send the Read Request Status
Command to the drive to determine the cause of another fault detected in the
drive such as a Write Fault, Seek Fault, etc).

9.3.3.5 Bit 11: Rotational Speed Tolerance is \( k \geq 0.5\% \) and \( < 1.0\% \).

Typically, this bit is 

If Bit 11 = 0, the rotational speed plus clock rate tolerance is \( k \geq 0.5\%

9.3.1.6 Bit 10: Transfer Rate \( \geq 10 \text{ MHz}, \leq 15 \text{ MHz} \).

9.3.1.8 Bit 8: Transfer rate \( k = 5 \text{ MHz} \).

ESDI Editing Changes between Rev 3 January 19 and Rev 3C October 20
9.3.1.9 Bit 7: Removable Cartridge Drive.
If Bit 7 is a 1, the disk drive ...........

When checking for ...........
........... If removable media is present, head 0 should be on the removable media drive. (The number of heads, both fixed and removable, is contained in the "Number of Heads" HAAH+ Specific Configuration response (for Command Modifier 0011).

9.5.1.5 Bit 11: Reserved Spindle is Synchronized.
This bit shall always be set to indicate that a drive capable of being synchronized is synchronized. Upon a change from the synchronized to the unsynchronized condition, the drive shall assert ATTENTION.

[This has been incorrect for months - it should have been updated when we added Synchronized Spindles to the Section 7]

Annex K: Synchronized Spindles.
(informative)

The synchronization of spindles ...........

There can only be one master drive at a time in a configuration. The MASTER SYNC signal from the slave drive selected to be a master may be turned around by the controller to become SLAVE SYNC, or the controller may direct the master drive designated as Master to turn around MASTER SYNC internally to become the SLAVE SYNC for the other drives. MASTER SYNC (only one SYNC signal is generated). MASTER SYNC is generated by the drive designated as the master designated as Master at least once per rotation, but may optionally be at a higher frequency.

SLAVE SYNC received by a drive is used as the synchronization signal to lock the spindles in step. The time to achieve synchronization varies, and is indicated by the slave drive asserting READY.

NOTE: A drive nominated as master Master Control does not synchronize to its MASTER SYNC signal but to the SLAVE SYNC received. (to avoid any anomalies that may arise if the controller introduces any delays)

In the event that a drive previously synchronized loses synchronization, but is otherwise operational, it does not negate READY.

<table>
<thead>
<tr>
<th>CMD Function</th>
<th>Switch No</th>
<th>Switch Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>
| x10100000 0000 = Slave | x10100000 0001 = Master | x11100000 0011 = Master Control | 0000 0010 = Unsynchronize

If a drive is set to Slave it does not generate MASTER SYNC, and it is responsible to synchronize its index to the SLAVE SYNC signal for the slaves.

If a drive is set to Master it generates MASTER SYNC and transmits it as the SLAVE SYNC signal to the slaves.

If a drive is set to Master Control it generates MASTER SYNC and transmits it as a signal. The output may be used by the controller to generate SLAVE SYNC to the slaves.

If a drive is set to Unsynchronized it ignores SLAVE SYNC.