ENDL

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Dear John,

Attached is a copy of the pages which were modified as a result of the comments received from Maxtor.

The changes made are marked in bold. As you can tell, there were no substantive changes made - mostly a case of improving the text to clarify the original intent.

Yours sincerely,

I. Dal Allan

7.18 Set Configuration (1110) (D-0).

This optional command should be rejected if it is not supported.

The Soft Switch Number provides up to 16 Identification values and the Soft Switch Parameter is a modifier. See Table 30.

Soft Switch modifiers are also used to configure disk drives capable of handling variable frequency recording, sometimes referred to as MCAV (Modified Constant Angular Velocity) or as Notched drives. The disk may be divided into zones of recording frequency that support a different number of sectors per track.

7.18.1 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'11'), the drive shall generate a signal as master and also respond as a slave to a signal received from another source.

A synchronized drive may be set to unsychronized operation (7-0 = x'80').

7.18.2 Notched Drives.

The controller may use Set Configuration to identify the zone to be worked with (the first zone is numbered as 1 and begins at cylinder 0).

When a drive has been set to operate with a zone, then all information reported is relative to that zone. To find the configuration of a notched drive the controller shall repeat the same procedure for each zone (as it would for a drive which does not support notches) until the command is rejected because there are no more zones.

The configuration information which may be zone-dependent is identified in Table 16, Table 17 and Table 18.

When set to Zone 0 the drive shall not respond as a notched drive but as a regular drive with only one recording frequency, that of the inner radius. If the drive is unable to respond in this way it shall reject the command.

7.18.3 Synchronized Sector Offset

When set to a value other than zero, the slave drive shall offset its synchronized position by the number specified e.g. if set to 64, the slave drive shall offset its position by one quarter rotation beyond behind that of the master. A drive designated as master shall reject this command.

7.18.4 Soft Switches.

Soft Switch modifiers are available for the vendor to use as a method of defining configuration information. The implementation of this feature provides users the advantage of reduced installation effort and vendors the advantage of being able to set up automatic testing procedures for different drive configurations.

As an example of the way in which this command may be used by a vendor, the dip switches could be numbered and parameter used to identify how the switches are to be set (1=On, 0=Off). This command would then override any physical position to which the switches are set.

It is recommended that the device be capable of retaining the switch configuration information between power cycles.

TABLE 30: SET CONFIGURATION SOFT SWITCH PARAMETER BITS

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	P
CMD Function				Switch No				Switch Parameter								
1	1	1	0	0	0	0	0	Vendor Unique								
					to											
				0	x	x	x									
				1	0	0	0	Reserved = 0								
					to											
				1	0	1	1									
				1	1	0	0	Set Synchronized Drive								
								x'00' = Slave								
								x'01' = Master								
								x'11' = Master Control								
								x'80' = Unsynchronize								
				1	1	0	1	Notched Drive Zone Number								
				1	1	1	0	Synchronized Sector Offset								
				1	1	1	1	Reserved = 0								

Example: If a magnetic disk drive is capable of supporting soft or hard sector operation according to the setting of Dipswitch 1 then the configuration may be described as follows:

| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | xxxx xx01 = Set Soft Sector |
| | | | | | | | | xxxx xx10 = Set Hard Sector |

7.19 (1111).

This opcode is reserved for Linking. In the event that any expansion of the command set is required in future revisions of this international standard, the Linking command would cause the drive to accept 17 additional bits of information before performing a designated function.

Annex K: Synchronized Spindles.
          (informative)

The synchronization of spindles between a number of drives may be used to facilitate additional functions such as fault tolerant arrays or higher transfer rate subsystems.

A generic implementation that permits a number of variations in configuring the subsystem is accomplished by using a separate cable, supplying additional Configuration Response data and supporting the Set Configuration command for programmed control.

There is no requirement that each drive implementation be plug-compatible to the extent that a multiple vendor drive subsystem operate. Mix and match of different manufacturers drives is unlikely because rpm, sync fields, sync bytes etc need to be virtually identical. However, if drives are designed to match the following recommendation, controllers can operate any bank of drives with a single implementation.

K.1 Signals.

The following signals are used on the separate cable which is daisy chained to each drive (it need not be connected to the controller).

```
        Disk          Signal   Ground
        Signals        Pin      Pin
        ----------     ------   ------
        GROUND                    1
  <--   MASTER SYNC      2
        Reserved         3
  -->   SLAVE SYNC       4 *
```
        * SLAVE SYNC may be a signal generated by the master drive.

There can only be one master drive at a time in a configuration. The MASTER SYNC signal from the slave selected to be a master may be turned around by the controller to become SLAVE SYNC, or the controller may direct the master drive to turn around MASTER SYNC internally to become the SLAVE SYNC for the other drives (only one SYNC signal is generated). MASTER SYNC is generated by the drive nominated as the 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 does not synchronize to its MASTER SYNC sign
  => al but to the SLAVE
  SYNC received (to avoid any problems that may arise if the controller introduc
  => es any delays).

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

K.2 Configuration Response.

The Synchronized Spindle Tolerance values define the range within which Indexes will lock up relative to each other (see also Table 17).

Command Modifier Bits 11-8	Subscript 7-0	Configuration Response
0 0 0 0	x	Values for Configuration of Drive and Format
	20	Synchronized Spindle Positive Tolerance (usecs)
	21	Synchronized Spindle Negative Tolerance (usecs)

K.3 Set Configuration.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	P
CMD Function				Switch No				Switch Parameter								
1	1	1	0	1	1	0	0	Set Synchronized Drive x'00' = Slave x'01' = Master x'11' = Master Control x'80' = Unsynchronized								

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

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

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

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

K.4 Electrical.

The drivers/receivers used are Open Collector (see 5.2). The driving distance of these parts is limited. In subsystems which contain more than 9 daisy chained units, multiple cables may be needed.

K.5 Connector.

Space is limited on small form factor drives so there may be variations in the type of connector used.

Some manufacturers with a connector used for diagnostics may assign the synchronizing signals to pins in the diagnostics connector.