X3T9.2/90-179

Accredited Standards Committee
*X3, Information Processing Systems**

DOC: X3/90-2530 X, S

Date: October 25, 1990
Proj: 587

Action Requested

TO: *Members, X3 -- For Balloting*
Members, SPARC
Officers of X3/TCs, SCs and SPARC SGs

SUBJECT: Transmittal of X3LB 1629

Approval of the incorporation of the attached editorial changes into the first publication of X3.170-1990, Enhanced Small Device Interface (ESDI).

X3T9 has approved the attached editorial changes for inclusion in X3.170-1990, Enhanced Small Device Interface (ESDI) The standard was approved in November, 1989, and is in the final editing stages prior to its first publication.

Due to recent ANSI policies, we are requiring the technical committee and X3 to approve such changes to an approved standard. These policies and the resultant procedures are discussed in X3/90-2529.

X3T9 has approved the editorial changes by a vote of 19-0.

Please review the attached documentation and return your letter ballot by **NOON, November 29, 1990.**

Yours truly,

Joanne M. Flanagan
Secretary, X3

Enclosures: X3LB 1629 (P's and A's only)
Attachment

* Operating under the procedures of the American National Standards Institute
X3 Secretariat, Computer and Business Equipment Manufacturers Association (CBEMA)
311 First St NW, Suite 500, Washington DC 20001-2178
Telephone: 202-626-5738 or 5746 FAX: 202-638-4922 or 202-628-2829

Accredited Standards Committee
X3, INFORMATION PROCESSING SYSTEMS*

Doc. No.:
Date:
Project:
Ref. Doc.:
Reply to:

September 5, 1990

Mr. Jean-Paul Emard
CBEMA
311 First Street, NW
Suite 500
Washington, DC 20001

Dear Jean-Paul:

This is with regard to editorial changes to dpANS X3.170-1990, Enhanced Small Device Interface (ESDI). The changes involve the deletion of Table 28 and the revision of section 7.12. A copy of a letter to Harvey Rosenfeld is attached that explains these changes in more detail.

X3T9 reviewed these changes at their August 24, 1990 meeting and approved the following motion by a vote of 19 yes and 0 no.

> "That X3T9 advise the X3 Secretariat that the ESDI editing changes to delete Table 28 and to revise section 7.12 are editorial and make no substantive changes to the document."

In addition, X3T9 has received a request from Magtron, Inc. (copy attached) to have their newly formed corporation added to the list of vendors in Table 22 located on page 48. X3T9 request that Magtron be assigned the code number 22.

Thank you for your consideration in this matter.

Sincerely,

Del Shoemaker
Chair, X3T9

645

Accredited Standards Committee
X3, INFORMATION PROCESSING SYSTEMS*

Doc. No.:
Date:
Project:
Ref. Doc.:
Reply to:

FAX to: (212) 398-0023

July 17, 1990

Mr. Harvey Rosenfeld
ANSI
1430 Broadway
New York, NY 10018

Subject: ESDI (BSR X3.170) Editorial Changes

Dear Harvey,

I have reviewed the effect of deleting Table 28 and adding the second paragraph to Section 7.12 with Larry Lamers. (I was unable to reach Dal Allan today as he is out of the office.) I believe these changes are purely editorial clarifications and make no technical changes. The rationale for these changes is as follows:

In section 7.12 the former table (Table 28: Diagnostic Parameter Bits) has been deleted and the remaining tables in the document renumbered. The document now contains one less table than prior revisions.

This table was deemed to be redundant with Figure 17 in section 7.1 after the terminology in section 7.12 was clarified. In the prior revision, paragraph 4 of 7.12 referred to a "diagnostic parameter" (shown as bits 7-0 of the Command Data Word in the old Table 28). This term was confusing in that "Command Subscript" is used elsewhere in the document for bits 7-0 of the Command Data Word as defined in Figure 17. This change brings the terminology used in paragraph 3, "Command Modifier", and in paragraph 4, "Command Subscript", into agreement with the terminology defined in Figure 17. Hence Table 28 was no longer needed.

The second paragraph of section 7.12 was added. This paragraph was formed from the last sentence of paragraph 1 of the prior revision and a clarification on how the status of the Initiate Diagnostics is returned. This is the same procedure used for other commands, however re-stating the procedure here is beneficial to readers of the document.

Thank you for your diligence pointing out a potential problem.

Sincerely,

John Lohmeyer, Chairman X3T9.2

cc: Dal Allan, ESDI Technical Editor (FAX: 408-867-2115)
Lawrence Lamers, X3T9.2 Secretary (FAX: 408-434-6469)
Del Shoemaker, X3T9 Chairman (FAX: 202-383-5024)

function shall ignore this command.

Drives that implement less than three values of offset shall respond to unimplemented offset commands as a legal offset function.

Seek or recalibrate commands restore offsets to zero. Simultaneous Data Strobe Offset, Track Offset, and Laser Power Adjust (optical only) are allowed by use of multiple commands.

TABLE 27 TRACK OFFSET COMMAND MODIFIER BITS

Command Modifier Bits 11-8	Function
0 0 0 x	Restore Offset to Zero
0 0 1 0	Positive Offset One
0 0 1 1	Negative Offset One
0 1 0 0	Positive Offset Two
0 1 0 1	Negative Offset Two
0 1 1 0	Positive Offset Three
0 1 1 1	Negative Offset Three
1 x x x	reserved = 0

Revised Text on next page. ALL subsequent tables renumbered

7.12 Initiate Diagnostics (1000) (D-O)

This optional command causes the drive to perform internal diagnostics. COMMAND COMPLETE indicates the completion of the diagnostics. ATTENTION with COMMAND COMPLETE indicates that a fault was encountered and status should be requested to determine the proper course of action.

The Command Modifier shall be zero to perform standard diagnostics. Alternatively, these bits may be used by the device to invoke alternate vendor diagnostics. See Table 28.

The alternate diagnostic routines shall be numbered in order beginning with x'01', and command reject issued when any unimplemented routines are requested. If the alternate diagnostics are not supported by the device, then the Command Modifier bits may be ignored.

The diagnostic parameter bits may be used to modify the routine per vendor specifications, but all routines shall execute when a default value of zero is present.

TABLE 28 DIAGNOSTIC PARAMETER BITS

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	P
CMD Function				Diagnostic No				Diagnostic Parameter								x

Table 25
Data Strobe Offset Command Modifiers

Command Modifier Bits 11-8	Function
0 0 0 x	Restore Offset to Zero
0 0 1 0	Early Offset One
0 0 1 1	Late Offset One
0 1 0 0	Early Offset Two
0 1 0 1	Late Offset Two
0 1 1 0	Early Offset Three
0 1 1 1	Late Offset Three
1 x x x	reserved for Disk

7.10.2 Optical (Data Recovery Offset). This optional command shall cause the drive to offset the data strobe in the direction and amount specified by the Command Modifier. See Table 26. Laser Power Adjust (Positive or Negative) shall cause the laser reading power to be changed from nominal power in either the positive or negative direction.

7.11 Track Offset (0111) (D-O). This optional command shall cause the drive to perform a track offset in the direction and amount specified by the Command Modifier as shown below in Table 27.

Disks which can offset their track position to recover data shall interpret the modifiers in a drive-specific manner. Disks which cannot provide the function shall ignore this command.

Drives that implement less than three values of offset shall respond to unimplemented offset commands as a legal offset function.

Seek or recalibrate commands restore offsets to zero. Simultaneous Data Strobe Offset, Track Offset, and Laser Power Adjust (optical only) are allowed by use of multiple commands.

Table 27
Track Offset Command Modifier Bits

Command Modifier Bits 11-8	Function
0 0 0 x	Restore Offset to Zero
0 0 1 0	Positive Offset One
0 0 1 1	Negative Offset One
0 1 0 0	Positive Offset Two
0 1 0 1	Negative Offset Two
0 1 1 0	Positive Offset Three
0 1 1 1	Negative Offset Three
1 x x x	reserved = 0

7.12 Initiate Diagnostics (1000) (D-O). This optional command shall cause the drive to perform internal diagnostics. COMMAND COMPLETE indicates the completion of the diagnostics.

If a diagnostic fails, ATTENTION and COMMAND COMPLETE shall be asserted to indicate that a fault was encountered. The status should use the Request Status and/or Request Vendor Unique Status commands to determine the proper course of action.

The Command Modifier shall be zero to perform standard diagnostics. Alternatively, these bits may be used by the device to invoke alternate vendor diagnostics.

The alternate diagnostic routines shall be numbered in order beginning with x'01', and command reject issued when any unimplemented routines are requested. If the alternate diagnostics are not supported by the device then the Command Modifier bits may be ignored.

The Command Subscript bits may be used to modify the routine per vendor specifications. The default routines specified by the vendor shall execute when a value of zero is present.

7.13 Set Unformatted Bytes/Sector (1001)(D-x) (optional). This optional command shall cause the drive to set the number of unformatted bytes per sector indicated in bits 11-0 (if implemented), plus the high-order 4 bits set by the Set High-Order Value command (if implemented). This command is valid only if the drive is configured to be in the hard-sector mode. This command is used only if the drive uses a settable counter for the number of bytes per sector and that counter is controllable from the interface.

The unformatted bytes per sector may be adjusted by the drive to meet the drive's requirements. If adjusted, the drive should attempt to retain the number of sectors per track desired by the controller (unformatted bytes per track divided by controller-requested unformatted bytes per sector) but may set a different number if format restrictions on the drive require this.

After setting a new value for Unformatted Bytes per Sector, the controller shall re-request the Unformatted Bytes per Sector and Sectors per Track Configuration Responses to verify that the drive is set to the expected values.

7.14 Set High-Order Value (1010) (D-O) (Optional). This optional command shall be issued to set the high-order 4 bits of commands which may be limited by the 12-bit address that can be defined in a single command. This command does not initiate any head movement. A subsequent Seek Address (0000) command is needed.

永晉資訊股份有限公司
MagTron Inc.

ADDRESS:
NO. 15-3, KAO SHAN LI, NAN KAO SHAN TING,
YANGMEI, TAOYUAN, 32618 TAIWAN, R. O. C.
TEL: 886-3-4751100(REP.) FAX: 886-3-478-0941

August 22, 1990

Mr. Del Shoemaker
Digital Equipment
1331 Pennsylvania Ave. #600
Washington, DC 20004
U.S.A.

Dear Mr. Shoemaker,

Magtron is currently manufacturing ESDI drives.. I am interested in getting an ESDI vendor identification code for Magtron.

Magtron, was founded in Oct. 1988, a Taiwan based company. Pacific Magtron, U.S. Branch Office of Magtron, is located in sunnyvale, Calif. Our current products, brochure enclosed, are originally licensed from CAST and made numerous changes on the drive. We assemble drive here in Taiwan & put on our marks on the drive too. We also designed new drives which still under development.

Please send me the appropriate application form for ESDI vendor ID code. I'll appreciate for your fast response.

Sincerely yours,

Felix Sheu
Director
Research & Develop Dept.
Magtron Inc.

Enclosure

Bigger Drives For Bigger Jobs.

The MagTron MT-4100 Series

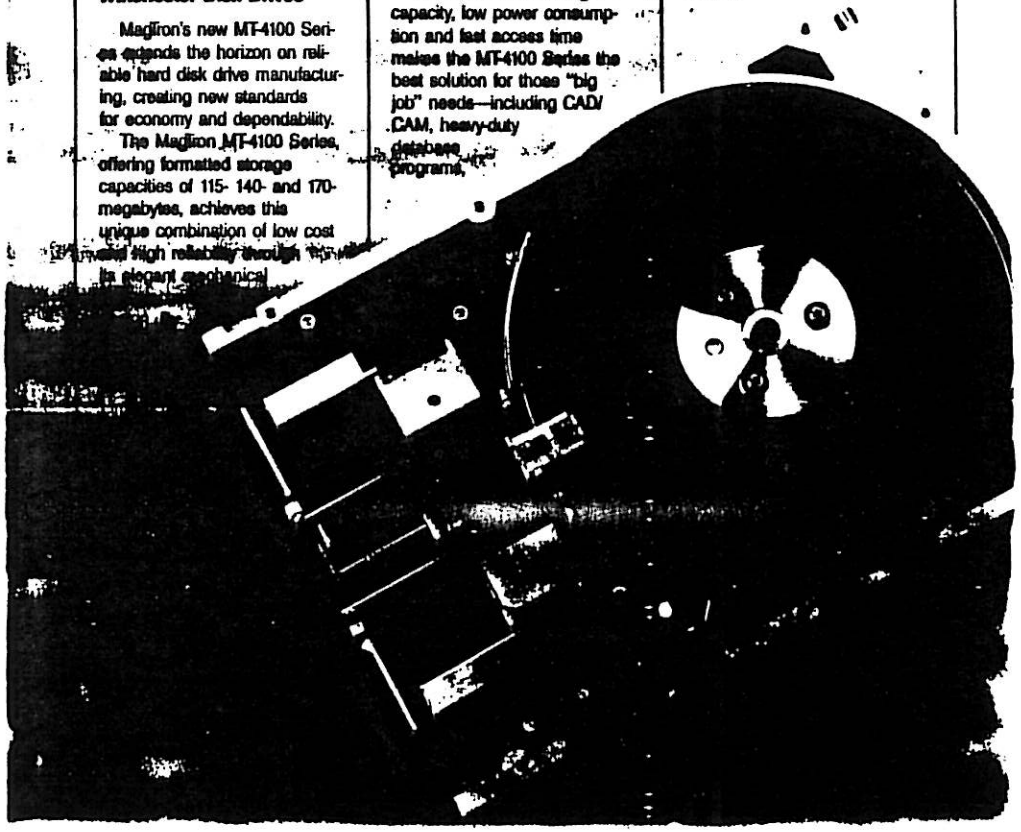
115, 140 and 170 Megabyte 5¼" Intelligent Winchester Disk Drives

MagTron's new MT-4100 Series expands the horizon on reliable hard disk drive manufacturing, creating new standards for economy and dependability.

The MagTron MT-4100 Series, offering formatted storage capacities of 115- 140- and 170-megabytes, achieves this unique combination of low cost and high reliability through its elegant mechanical electronics have been incorporated onto a single printed circuit board by utilizing a full complement of custom-

This combination of high capacity, low power consumption and fast access time makes the MT-4100 Series the best solution for those "big job" needs—including CAD/CAM, heavy-duty database programs,

LAN servers and multi-user/multi-tasking applications—that play such an important role in today's increasingly market.



MagTron MT-4100 Series

FEATURES / BENEFITS

FEATURES	BENEFITS
■ Thin film Read/Write heads	■ Improve data margins
■ High efficiency linear carriage system	■ Improves repeatability in head positioning and greater off-track margins; gives low power dissipation in HDA
■ Voice coil actuator	■ Provides fast access time and minimum settling times
■ Closed loop servo systems & embedded sector servo	■ Offer repeatability for positioning & precise speed control
■ Ventilated spindle system	■ Eliminates temperature inducert errors and allows for operation over a wide temperature range
■ Head preamps located on carriage in HDA	■ Reduces noise sensitivity & improves signal to noise ratio
■ Automatic actuator lock & dedicated landing zone for heads on power down	■ Prevent damage to data during shipping & handling
■ Inner and outer guard bands	■ Detect data area automatically
■ Prerecorded electrical information on dedicated servo surface	■ Features automatic re-zero
■ Automatic seek termination	■ Eliminates possible head/carriage damage
■ High performance standard interface: ESDI or SCSI	■ Enables easy integration

SPECIFICATIONS

Model	MT-4115	MT-4140	MT-4170
Performance Specifications:			
Capacity Unformatted			
Per Drive (M Bytes)	138	172	207
Per Surface (M Bytes)	34.6	34.6	34.6
Per Track (Bytes)	21,600	21,600	21,600
Capacity Formatted			
• Per Drive (M Bytes)	115	140	170
Per Surface (M Bytes)	28.6	28.6	28.6
Per Track (Bytes)	17,920	17,920	17,920
Per Sector (Bytes)	512	512	512
Transfer Rate (M bits/sec)	10	10	10
Access Time (m sec incl. setting)			
Average	25	25	25
Track to Track	5	5	5
Maximum	55	55	55
Functional Specifications:			
Rotational Speed (RPM)	3600	3600	3600
Average Latency (m sec)	8.33	8.33	8.33
Recording Density (BPI)	21,074	21,074	21,074
Flux Change Per Inch	14,050	14,050	14,050
Track Density (TPI)	1480	1480	1480
Track Per Surface	1600	1600	1600
Data Tracks	1597	1597	1597
Defect Map Tracks	2	2	2
Data Heads	4	5	6
Servo Heads	1	1	1
Discs	3	3	4
Recording Code	2,7 RLL	2,7 RLL	2,7 RLL
Drive Interface:	ESDI/SCSI	ESDI/SCSI	ESDI/SCSI

• The formatted capacity above was calculated with no spare sectors assigned.

Physical Specifications:

Environmental Limits (operating)	
Ambient Temperature	50°F to 115°F (10°C to 46°C)
Gradient	less than 18°F (10°C)/hour
Relative Humidity	8% to 80%, no condensation
Wet Bulb, Maximum	78.8°F (26°C)
Altitude	−200 ft. to 10,000 ft. (−60 to 3,000 meters)
Vibration	.010" disp. (p-p), 2-22Hz, 25G, 22-500Hz
Shock	1G max, 11 msec
Environmental Limits (non-operating)	
Ambient Temperature	−40°F to 140°F (−40°C to 60°C)
Gradient	less than 18°F (10°C)/hour
Relative Humidity	5% to 95%, no condensation
Wet Bulb, Maximum	78.8°F (26°C)
Altitude	−200 ft. to 40,000 ft. (−60 to 12,000 meters)
Vibration	.040" disp. (p-p), 2-22Hz, 1.0G, 22-500Hz
Shock	30G max, 11 msec
Transport	42" max. packaged drop
Power Requirements	
DC Voltage	+12 VDC ± 5%, 1.1 AMP Nom., 3.5 AMP Start + 5 VDC ± 5%, 1.1 AMP Nom. (SCSI), 0.7 AMP Nom. (ESDI).
Power Dissipation	21 watts typical
Mechanical Dimensions	
Height	1.625 in.
Width	5.750 in.
Depth	8.000 in.
Weight	4 lb.

Reliability Specifications:

MTBF	30,000 POH, typical usage
Preventive Maintenance	non required
Adjustments	non required
MTTR	15 minutes
Component Design Life	5 years
Errors Rates	
Soft read errors	1 per 10^{10} bits read
Hard read errors	1 per 10^{12} bits read
Seek errors	1 per 10^{6} seeks

• Specifications are subject to be changed without notice

MagTron Inc.
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