



Digital Equipment Corporation

ENGINEERING SPECIFICATION

Date: March 12, 1998

Title: PCXRN-AR 32X ATAPI CD Rom Toshiba XM6202B Frost White Bezel

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REVISIONS

Table with 7 columns: REV, DESCRIPTION, CHG NO, ORIG, DATE, APPD BY, DATE. Row 1: A, Release to ECO Control, B.Bucca, 2/17/98, B. McLane, 2/17/98

Table with 6 columns: Engineer, Approved, Size, Code, Number, Rev. Values: B.Bucca, B. McLane, K, SP, PCXRN-AR-DBT, A. Includes footer 'Sheet 1 of 10'.



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General Description:

This specification defines the detailed requirements of a drive capable of reading CD-ROM disk 8 or 12 cm in diameter. This drive reads digital data at maximum 32 times (13.8-32 times Constant Angular Velocity) faster rotational speed and has an ATAPI (ATA Packet Interface).

Applicable Documents (per latest revision on date of order):

International Organization For Standardization Standards:

ISO DIS 7779 Acoustics: Measurement of Noise Emitted from Computer Business Equipment - Second draft proposal June, 1982

ISO 9000 Quality Management and Quality Assurance

Federal Communications Commission:

FCC Part 15, Docket 20780, Subpart J for class B equipment in an enclosure

Underwriter's Laboratories, Inc.

UL-STD-1950 Safety of information Technology Equipment with sub clauses 1-7 Applicable Appendix and Supplement B.

Canadian Standards Association:

CSA-STD-C22.2 No. 950 Safety of Information Technology Equipment including Electrical Business Equipment.

International Electro-technical Commission:

EN-60950 (IEC 950) Safety of Telecommunications Apparatus including Information Processing Equipment

C.I.S.P.R.22 Class B

Engineer	Approved	Size	Code	Number	Rev
<b>B. Bucca</b>	<b>B. McLane</b>	<b>K</b>	<b>SP</b>	<b>PCXRN-AR-DBT</b>	<b>A</b>
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The Council of European Communities:

89/366/EEC C E Mark

SFF Committee:

SFF-8020i Rev 2.6 ATAPI Specifications
SFF-8028i Rev 1.0 ATAPI Specifications

Toshiba Corporation:

79-860023-000 XM-6202B Product Specifications Manual

1.0 Drive Requirements:

This drive will comply to the product description in the supplier's product manual, for the Toshiba XM-6202B Product Specifications Manual and this specification.

2.0 Drive Performance:

The following parameters are the minimum requirements to meet this product specification.

B. Applicable Disk Format:

Red-Book, Yellow-Book, CD-ROM XA, CD-I Bridge (Photo-CD, Video CD), CD-I CD-I Ready, CD-G and Multi-session (Photo-CD, CD-EXTRA, CD-RW, CD-R)

C. Disk Capacity (Yellow Book):

User Data/Block 2,048 byte/block (mode 1)
User Data/Block 2,336byte/block (Mode 2)

D. Rotational Speed:

6-10X (max.10X) Approx. 2,000 to 3,000 rpm
13.8-32X (max.32X) Approx. 6,900 rpm

E. Transfer Rates:

Table with 5 columns: Engineer, Approved, Size, Code, Number, Rev. Values: B. Bucca, B. McLane, K, SP, PCXRN-AR-DBT, A. Includes footer 'Sheet 3 of 10'.



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Sustained Block Transfer Rate
Approx. 450-750 blocks/s (6-10X)
Approx. 1,035-2,400 blocks/s (13.8-32X)

Sustained Data Transfer Rate Mode 1
Approx. 900-1,500 K Bytes/s(6-10X)
Approx. 2,070-4,800 K Bytes/s(13.8-32X)

Sustained Data Transfer Rate Mode 2
Approx. 1,026-1,710 K Bytes/s(6-10X)
Approx. 2,359-5,472 K Bytes/s(13.8-32X)

Sustained PIO host transfer rate 16.67 byte/sec (PIO Mode 4)
Single word DMA transfer mode-2 8.33 Mbytes/s
Multiple word DMA transfer mode-2 16.7 Mbytes/s

Data Buffer Capacity 256 K Bytes

F. Access Times:

Average Random Access Time 83 ms Typ (13.8-32X) 95 ms Typ (6-10X)
Average Random Seek Time 78 ms Typ (13.8-32X) 90 ms Typ (6-10X)
Average Full Stroke Access Time 135 ms Typ (13.8-32X) 170 ms Typ (6-10X)

G. Spin up Time (Focus Search Time and Disc Motor Start up Time)

Typical 4.5s (32X Mode)
Max. 6.5s (32X Mode)

Table with 5 columns: Engineer, Approved, Size, Code, Number, Rev. Values include B. Bucca, B. McLane, K, SP, PCXRN-AR-DBT, A. Includes footer 'Sheet 4 of 10'.

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1.0 Physical Specifications:

2.1 Mechanical Dimensions (See Figure 1):

Height (Max)	41.5 mm (1.633 Inches)
Width (Max)	146 mm (5.748 Inches)
Depth (Max)	193 mm (7.598 Inches) (Excluding Bezel)
Weight (Max)	0.98 Kg (2.16 Pounds)

Figure 1: Typical Drive Mounting Dimensions

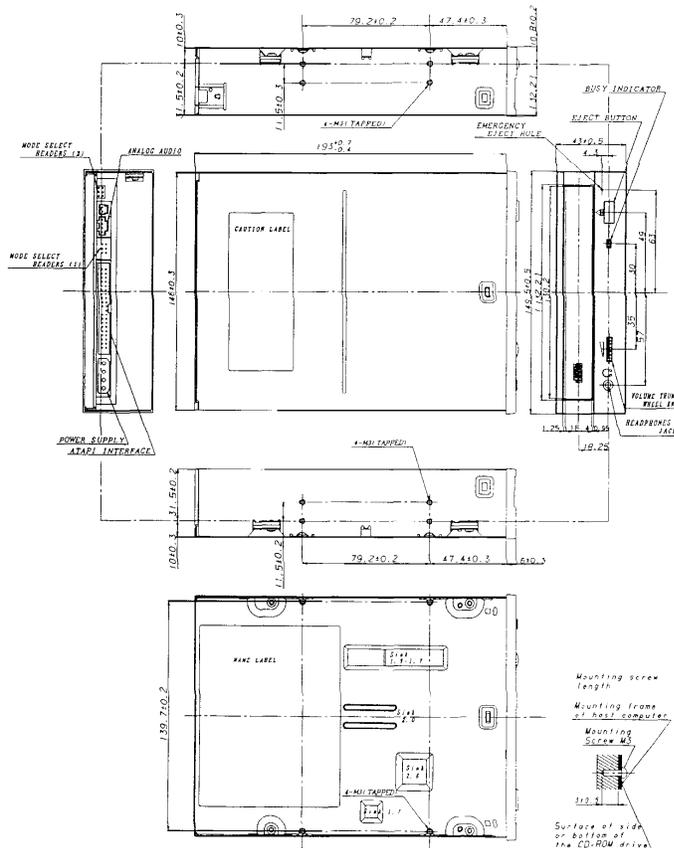


Figure 2 External Dimensions (Units:mm)

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Title: PCXRN-AR 32X ATAPI CDROM Toshiba XM6202B Frost White Bezel**3.2 Drive Mounting:**Slant Angle: The drive is to be mounted within Horizontal  $\pm 20^\circ$ , Vertical  $+0^\circ/-10^\circ$  (side to side)  $\pm 10^\circ$  (front to rear).Mounting: M3 X 3mm  $\pm 0.5$  in length screws are recommended. Mounting screw torque should be 5-10 lb.-inch.**4.0 Power Requirements:**Supply Voltage Requirement: The voltages required to operate the drive are +5VDC  $\pm 5\%$ , and +12VDC  $\pm 5\%$ .

Maximum power supply ripple allowed: 100 mV P to P (+5V)

Maximum power supply spike allowed: 100 mV P to P (+5V)

**4.1 Drive Current Requirements: All values are typical except Spin-up Mode.**

Voltage	+5 V	+12 V
Stand-by (Laser off, Motor off)	0.09A	0A
Continuous Data Transfer	0.45A (32X)	0.45A (32X)
Continuous Audio Playback	0.35A (10X)	0.20A (10X)
Idle (Laser on, Motor on)	0.35A (10X)	0.20A (10X)
Average (20% Random Access)	0.45A (32X)	0.45A (32X)
Maximum (100% Random Access)	0.49A (32X)	0.45A (32X)
Peak in executing Access (10 to 300 ms)	1.3A (32X)	1.5A (32X)

**5.0 Acoustics: 45 dB (IHFA weighted at 1 meter)****6.0 Analog Out**

Output Level	0.75 V (rms. Typ)
Type	Unbalanced
Load Impedance	47K $\Omega$ min
Frequency Response	20Hz to 20kHz $\pm 3$ dB
Distortion	0.014% Typ (at 1 kHz with 20 kHz LPF)
Signal to Noise Ratio	83dB Typ (IEC 179 A-weighted)

**7.0 Headphone Output**

Output Level	0.8V (rms. Typ)
Level Adjust Controller	Continuous Type (Thumb Wheel Knob)
Load Impedance	100 $\Omega$ (Nominal)
Connector	3.5 mm dia Stereo Headphone Jack

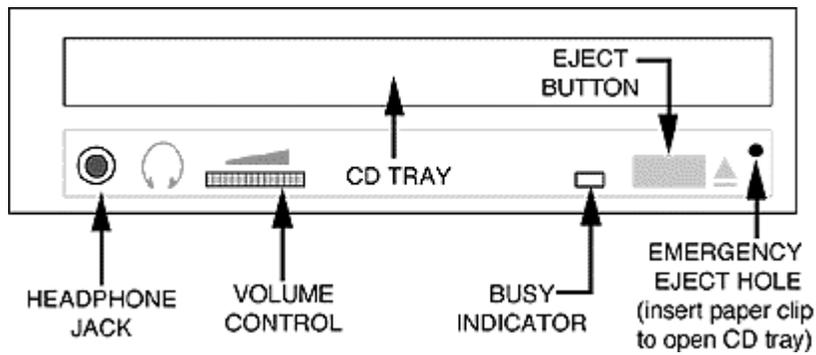
Engineer	Approved	Size	Code	Number	Rev
<b>B. Bucca</b>	<b>B. McLane</b>	<b>K</b>	<b>SP</b>	<b>PCXRN-AR-DBT</b>	<b>A</b>
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8.0 Front and Rear Views

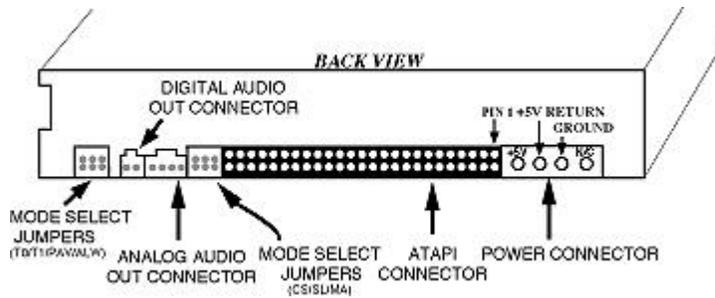
Figure 2. Front panel



Emergency Eject Hole

Insert Solid Bar (paper clip) to eject tray with power off.

Figure 3. Rear panel



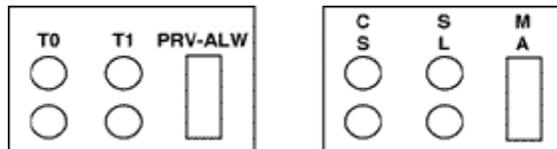
Engineer	Approved	Size	Code	Number	Rev
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9.0 Drive Jumper Ship Configuration      The following drive configuration will be set at the factory prior to shipment.

Device Jumper Configuration      Jumper across MA terminals  
 Mode Select Configuration.      Jumper across PRV/ALW terminals

Figure 4 Jumper Blocks

10.0

Interface Connectors:

The recommended connectors and their numbers are shown below:

10.1 40 Pin Connector      3M 3417-7000 or equivalent  
 Strain Relief      3M 3448-2040 or equivalent  
 Flat Cable (Standard 28 AWG)      3M 3365-40 or equivalent  
 Flat Cable (Standard 28 AWG)      3M 3517-40 (shielded) or equivalent

**Note:** The Maximum cable length is 45.7 cm(18 in), to key the IDE mating connector you must plug the hole at pin 20

10.2 DC Power Connector

4-pin power connector      AMP P/N 84069-1 or equivalent  
 Loose-piece contacts      AMP P/N 61173-4 or equivalent  
 Strip contacts      AMP P/N 350078-4 or equivalent  
 3- pin connector      Molex P/N 39-00-0033 or equivalent  
 Strip contacts      Molex P/N 39-00-0023 or equivalent  
 Loose-piece contacts      Molex P/N 39-00-00341 or equivalent

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## 11.0 AT Interface connector pin assignments:

## 11.1 In the following table:

- indicates active low signal.

Direction (Dir) is with respect to the drive.

IN indicates input to the drive.

OUT indicates output from the drive.

I/O indicates the signal is bi-directional

Reserved pins/ground do not have direction

PDIAG- and DASP- are used for communication between the Master and Slave drives.

Pin	Signal	Dir	Pin	Signal	Dir
1	RESET-	IN	2	Ground	-
3	Data Bit 7	I/O	4	Data Bit 8	I/O
5	Data Bit 6	I/O	6	Data Bit 9	I/O
7	Data Bit 5	I/O	8	Data Bit 10	I/O
9	Data Bit 4	I/O	10	Data Bit 11	I/O
11	Data Bit 3	I/O	12	Data Bit 12	I/O
13	Data Bit 2	I/O	14	Data Bit 13	I/O
15	Data Bit 1	I/O	16	Data Bit 14	I/O
17	Data Bit 0	I/O	18	Data Bit 15	I/O
19	Ground	-	20	Key	No Pin
21	DMARQ	OUT	22	Ground	-
23	DIOW-	IN	24	Ground	-
25	DIOR-	IN	26	Ground	-
27	IORDY	OUT	28	CSEL	-
29	DACK1-	IN	30	Ground	-
31	INTRQ	OUT	32	IOCS16-	OUT
33	DA1	IN	34	PDIAG-	I/O
35	DA0	IN	36	DA2	IN
37	CS1FX-	IN	38	CS3FX-	IN
39	DASP-	I/O	40	Ground	-

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12.0 Reliability:

13.1 Error Rate

Hard Read Error Rate (Byte Error Rate) Allowing 5 Retries

Mode 1: 10 to the 15<sup>th</sup> Max

Mode 2 10 to the 12<sup>th</sup> Max

Seek Error Rate Allowing 5 Retries 10 to the 6<sup>th</sup>

14.2 MTBF:

The disk drive shall demonstrate 200,000 hours MTBF as measured by the Ongoing Reliability Test and schedule defined by the Basic Order Agreement.

12.3 Environmental Conditions

Operating Temperature	5°C to 50°C
Storage Temperature	-10°C to 60°C
Shipping Temperature	-40°C to 65°C
Operating Temperature Gradient	11°C/hour (max)
Storage Temperature Gradient	20°C/hour (max)
Shipping Temperature Gradient	20°C/hour (max)
Operating Humidity	8% to 80% (wet bulb 27°C max)
Storage Humidity	5% to 95% (wet bulb 27°C max)
Shipping Humidity	5% to 95%

Note: In all of the above conditions there must be no condensation

12.4 Vibration

Operating (13.8-32X)	No hard error 5 to 500 Hz 2.45 m/s <sup>2</sup> (0.25G) (0-P) (excluding resonance points)
Non operating	No damage 5 to 10 Hz 5mm (P-P) 10 to 500Hz 9.8 m/s <sup>2</sup> (1G) (0-P)
Shipping	No damage 10 to 25 Hz 9.8 m/s <sup>2</sup> (1G) (0-P) XYZ/30 min each

12.5 Shock

Operating (13.8-32X)	No hard error 14.7 m/s <sup>2</sup> (1.5G) Horizontal 7.8 m/s <sup>2</sup> (0.8G) Vertical Data read recoverable 98 m/s <sup>2</sup> (10G)
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Note: Both conditions Half sine wave 11ms/10s interval

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