SFF Committee

SFF-8501

Specification for

Form Factor of 5.25" Disk Drives

Standardized as EIA-741 at Rev 1.1 June 4, 1995

This specification was submitted as a project to the Electronic Industries Alliance by being incorporated into SFF-8500, and was Expired at that time.

EIA standards can be purchased from http://global.ihs.com/

SFF specifications are available at http://www.snia.org/sff/specifications
or ftp://ftp.seagate.com/sff

This specification was developed by the SFF Committee prior to it becoming the SFF TA (Technology Affiliate) TWG (Technical Working Group) of SNIA (Storage Networking Industry Association).

The information below should be used instead of the equivalent herein.

POINTS OF CONTACT:

Chairman SFF TA TWG
Email: SFF-Chair@snia.org

If you are interested in participating in the activities of the SFF TWG, the membership application can be found at:
http://www.snia.org/sff/join

The complete list of SFF Specifications which have been completed or are currently being worked on can be found at:
http://www.snia.org/sff/specifications/SFF-8000.TXT

The operations which complement the SNIA's TWG Policies & Procedures to guide the SFF TWG can be found at:
http://www.snia.org/sff/specifications/SFF-8032.PDF

Suggestions for improvement of this specification will be welcome, they should be submitted to:
http://www.snia.org/feedback

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SFF Committee documentation may be purchased (see p4).
SFF Committee documents are available by FaxAccess at 408-741-1600

SFF Committee

SFF-8501 Specification for

Form Factor of 5.25" Disk Drives

Rev 1.1 June 4, 1995

Secretariat: SFF Committee

Abstract: This document defines the dimensions for 5.25" devices.

This document provides a common specification for systems manufacturers, system integrators, and suppliers of storage devices. This is an internal working document of the SFF Committee, an industry ad hoc group.

This document is made available for public review, and written comments are solicited from readers. Comments received by the members will be considered for inclusion in future revisions of this document.

Support: This document is supported by the identified member companies of the SFF Committee.

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Date of Printing: October 16, 1995

EXPRESSION OF SUPPORT BY MANUFACTURERS

The following member companies of the SFF Committee voted in favor of this industry specification.

3M
Adaptec
AMP
Cirrus Logic
ENDL
Honda Connector
IBM
Madison Cable
Maxtor
Methode
Quantum
Robinson Nugent
Seagate
Sigmax

The following member companies of the SFF Committee voted to forward this industry specification to an accredited standards body.

Methode

If you are not receiving the documentation of SFF Committee activities or are interested in becoming a member, the following signup information is reprinted here for your information.

SFF COMMITTEE

Annual SFF Committee Membership Fee	$ 1,800.00
Annual SFF Committee Documentation Fee	$ 300.00
Annual Surcharge for AIR MAIL to Overseas	$ 100.00

Funds received will be retained in escrow until earned.

Name: _____

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_____

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Please register me as the company representative on the SFF Committee ($1,800 fee includes documentation).

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SFF Committee 408-867-6630
14426 Black Walnut Ct Fx: 408-867-2115
Saratoga CA 95070 Email: 250-1752@mcimail.com

Bank Transfer Routing: Bank of America, Saratoga
121000358 04743 00743

If you are not receiving the documentation of SFF Committee activities or are interested in becoming a member, the following signup information is reprinted here for your information.

Membership includes voting privileges on SFF Specs under development.

CD_Access Electronic documentation contains:
- Minutes for the year-to-date plus all of last year
- Email traffic for the year-to-date plus all of last year
- The current revision of all the SFF Specifications, as well as any previous revisions distributed during the current year.

Meeting documentation contains:
- Minutes for the current meeting cycle.
- Copies of Specifications revised during the current meeting cycle.

Each electronic document mailing obsoletes the previous mailing of that year e.g. July replaces May. To build a complete set of archives of all SFF documentation, retain the last SFF CD_Access mailing of each year.

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Address: _____

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___ Voting Membership w/Meeting documentation $ 1,800

___ Non-voting Observer w/Electronic documentation $ 660 U.S.
$ 760 Overseas

___ Non-voting Observer w/Meeting documentation $ 300 U.S.
$ 400 Overseas

Check Payable to SFF Committee for $_____ is Enclosed

Please invoice me for $_____ on PO #: _____

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SFF Committee
14426 Black Walnut Ct
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Foreword

When 2 1/2" diameter disk drives were introduced, there was no commonality on external dimensions e.g. physical size, mounting locations, connector type, connector location, between vendors.

The first use of these disk drives was in specific applications such as laptop portable computers in which space was at a premium and time to market with the latest machine was an important factor. System integrators worked individually with vendors to develop the packaging. The result was wide diversity, and with space being such a major consideration in packaging, it was not possible to replace one vendor's drive with a competitive product.

The desire to reduce disk drive sizes to even smaller dimensions such as 1.8" and 1.3" made it likely that devices would become even more constrained in dimensions because of a possibility that such small devices could be inserted into a socket, not unlike the method of retaining semiconductor devices.

The problems faced by integrators, device suppliers, and component suppliers led to the formation of an industry ad hoc group to address the marketing and engineering considerations of the emerging new technology in disk drives. After two informal gatherings on the subject in the summer of 1990, the SFF Committee held its first meeting in August.

During the development of the form factor definitions, other activities were suggested because participants in the SFF Committee faced problems other than the physical form factors of disk drives. In November 1992, the members approved an expansion in charter to address any issues of general interest and concern to the storage industry. The SFF Committee became a forum for resolving industry issues that are either not addressed by the standards process or need an immediate solution.

At the same time, the principle was adopted of restricting the scope of an SFF project to a narrow area, so that the majority of documents would be small and the projects could be completed in a rapid timeframe. If proposals are made by a number of contributors, the participating members select the best concepts and uses them to develop specifications which address specific issues in emerging storage markets.

Those companies which have agreed to support a documented specification are identified in the first pages of each SFF Specification. Industry consensus is not an essential requirement to publish an SFF Specification because it is recognized that in an emerging product area, there is room for more than one approach. By making the documentation on competing proposals available, an integrator can examine the alternatives available and select the product that is felt to be most suitable.

Suggestions for improvement of this document will be welcome. They should be sent to the SFF Committee, 14426 Black Walnut Ct, Saratoga, CA 95070.

The development work on this specification was done by the SFF Committee, an industry group. The membership of the committee since its formation in 1990 has included the following organizations:

3M	Microsoft
Adaptec	Molex
AMP	MiniStor Peripherals
Apple Computer	Mitsumi
Areal Technology	Molex
Aztech Systems	National Semiconductor
Berg	NEC Deutschland
Burndy	Oak Technology
Cirrus Logic	Panasonic
Compaq Computer	Philips LMS
Conner Peripherals	PrairieTek
Dell Computer	Quantum
Digital Equipment	Rodime
Elastomeric Technologies	Samsung
Elco	Sanyo
ENDL	Seagate
Fujitsu Microelectronics	Silicon Systems
Hewlett Packard	Sony
IBM	Specialty Electronics
Integral Peripherals	Stocko Connectors
Intel	Sun Microsystems
Intellistor	TEAC America
JVC	Wearnes Technology
Maxtor	Western Digital
Methode Electronics	Zenith Data Systems

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SFF Committee --

Form Factor of 5.25" Disk Drives

1. Scope

The 85xx suite of specifications defines the configuration characteristics with 5.25" disk drives and CD-ROMs.

The purpose of the 85xx suite is to define the external characteristics of devices such that products from different vendors may be used in the same mounting configurations.

The set of specifications provide external dimensions, connectors, connector placement, mounting holes and interface pinouts to assist manufacturers and systems integrators.

- SFF-8500 contains general information regarding connector space, mounting considerations and measurement requirements.
- SFF-8501 defines the dimensions of 5.25" magnetic disk drives.
- SFF-8551 defines the dimensions of 5.25" CD-ROM drives.
- Other specifications in the 85xx family define the location of connectors.

In an effort to broaden the applications for storage products, an ad hoc industry group of companies representing system integrators, peripheral suppliers, and component suppliers decided to address issues which appear in the marketplace that affect many OEMs and vendors.

The SFF Committee was formed in August, 1990 and the first working document was introduced in January, 1991.

1.1 Description of Clauses

Clause 1 contains the Scope and Purpose.

Clause 2 contains Referenced and Related Standards and SFF Specifications.

Clause 3 contains the General Description.

Clause 4 contains the Glossary.

Clause 5 and successive Clauses (if any) contain detailed characteristics.

2. References

The SFF Committee activities support the requirements of the storage industry, and it is involved with several standards.

2.1 Industry Documents

The following interface standards are relevant to many SFF Specifications.

- X3.131R-1994 SCSI-2 Small Computer System Interface
- X3T9.2/0855 SPI (SCSI-3 Parallel Interface)
- X3.221-199x ATA (AT Attachment)
- X3T10/0948 ATA-2 (ATA Extensions)

2.2 SFF Specifications

There are several projects active within the SFF Committee. At the date of printing document numbers had been assigned to the following projects. The status of Specifications is dependent on committee activities.

F = Forwarded	The document has been approved by the members for forwarding to a formal standards body.
P = Published	The document has been balloted by members and is available as a published SFF Specification.
A = Approved	The document has been approved by ballot of the members and is in preparation as an SFF Specification.
C = Canceled	The project was canceled, and no Specification was Published.
D = Development	The document is under development at SFF.
E = Expired	The document has been published as an SFF Specification, and the members voted against re-publishing it when it came up for annual review.
i = Information	The document has no SFF project activity in progress, but it defines features in developing industry standards. The document was provided by a company, editor of an accredited standard in development, or an individual. It is provided for broad review (comments to the author are encouraged).
s = submitted	The document is a proposal to the members for consideration to become an SFF Specification.

Spec #	Rev	List of Specifications as of October 16, 1995
SFF-8000		SFF Committee Information
SFF-8001i	E	44-pin ATA (AT Attachment) Pinouts for SFF Drives
SFF-8002i	2.1	68-pin ATA (AT Attachment) for SFF Drives
SFF-8003	1.1	SCSI Pinouts for SFF Drives
SFF-8004	1.1	Small Form Factor 2.5" Drives
SFF-8005	2.5	Small Form Factor 1.8" Drives
SFF-8006	2.0	Small Form Factor 1.3" Drives
SFF-8007	0.1	2mm Connector Alternatives
SFF-8008	2.3	68-pin Embedded Interface for SFF Drives
SFF-8009	3.1	Unitized Connector for Cabled Drives
SFF-8010	1.0	Small Form Factor 15mm 1.8" Drives
SFF-8011i	2.0	ATA Timing Extensions for Local Bus
SFF-8012	1.0	Power Connector Pin Dimensions
SFF-8013	0.1	ATA Download Microcode Command
SFF-8014	C	Unitized Connector for Rack Mounted Drives
SFF-8015	3.7	SCA Connector for Rack Mounted SFF SCSI Drives
SFF-8016	C	Small Form Factor 10mm 2.5" Drives
SFF-8017	1.7	SCSI Wiring Rules for Mixed Cable Plants
SFF-8018	0.1	ATA Low Power Modes
SFF-8019	2.0	Identify Drive Data for ATA Disks up to 8 GB
SFF-8020i	2.5	ATA Packet Interface for CD-ROMs
SFF-8028i		- Errata to SFF-8020 Rev 2.5
SFF-8029	1.4	- Errata to SFF-8020 Rev 1.2

SFF-8030	1.7	SFF Committee Charter
SFF-8031		Named Representatives of SFF Committee Members
SFF-8032	1.2	SFF Committee Principles of Operation
SFF-8033i	1.0	Improved ATA Timing Extensions to 16.6 MBs
SFF-8034i	3.0	High Speed Local Bus ATA Line Termination Issues
SFF-8035i	1.0	Self-Monitoring, Analysis and Reporting Technology
SFF-8036i	1.1	ATA Signal Integrity Issues
SFF-8037i	1.0	Intel Small PCI SIG
SFF-8038i	1.0	Intel Bus Master IDE ATA Specification
SFF-8039i	1.0	Phoenix EDD (Enhanced Disk Drive) Specification
SFF-8040	1.2	25-pin Asynchronous SCSI External Connector
SFF-8041	1.0	SCA-2 Connector Backend Configurations
SFF-8042	x.x	VHDCI Connector Backend Configurations
SFF-8045	3.2	40-pin SCA-2 Connector w/Parallel Selection
SFF-8046	2.2	80-pin SCA-2 Connector for SCSI Disk Drives
SFF-8047	3.2	40-pin SCA-2 Connector w/Serial Selection
SFF-8048	1.1	80-pin SCA-2 Connector w/Parallel ESI
SFF-8200	1.1	2 1/2" drive form factors (all of 82xx family)
SFF-8201	1.2	2 1/2" drive form factor dimensions
SFF-8212	1.2	2 1/2" drive w/SFF-8001 44-pin ATA Connector
SFF-8300	1.1	3 1/2" drive form factors (all of 83xx family)
SFF-8301	1.2	3 1/2" drive form factor dimensions
SFF-8302	1.1	3 1/2" Cabled Connector locations
SFF-8332	1.2	3 1/2" drive w/80-pin SFF-8015 SCA Connector
SFF-8337	1.2	3 1/2" drive w/SCA-2 Connector
SFF-8342	1.2	3 1/2" drive w/Serial Unitized Connector
SFF-8400	0.1	Very High Density Cable Interconnect
SFF-8500	1.1	5 1/4" drive form factors (all of 85xx family)
SFF-8501	1.1	5 1/4" drive form factor dimensions
SFF-8508	1.1	5 1/4" ATAPI CD-ROM w/audio connectors
SFF-8551	1.2	5 1/4" CD-ROM 1" High form factor

2.3 Sources

Copies of ANSI standards or proposed ANSI standards may be purchased from Global Engineering.

15 Inverness Way East	800-854-7179 or 303-792-2181
Englewood	303-792-2192Fx
CO 80112-5704	

Copies of SFF Specifications are available by FaxAccess or by joining the SFF Committee as an Observer or Member.

14426 Black Walnut Ct	408-867-6630x303
Saratoga	408-867-2115Fx
CA 95070	FaxAccess: 408-741-1600

FaxAccess is a computer-operated service capable of faxing copies of documents selected from a menu. Anyone ordering documents over FaxAccess must be using the handset of a fax machine, as the documents are transmitted over the same line as the caller dialed in on to make the selection(s).

3. General Description

The application environment for small form factor disks is any computer connecting to one or more disks in a restricted packaging environment.

The purpose of an SFF Specification is to provide information that will assist vendors to design products that can fit the same packaging envelope.

Small form factor disks are widely-used where low power and small size are important configuration parameters.

4. Definitions and Conventions

4.1 Definitions

For the purpose of SFF Specifications, the following definitions apply:

4.1.1 IDE (Integrated Drive Electronics): IDE describes a device with built in ATA protocol electronics.

4.1.2 Optional: This term describes features which are not required by the SFF Specification. However, if any feature defined by the SFF Specification is implemented, it shall be done in the same way as defined by the Specification. Describing a feature as optional in the text is done to assist the reader. If there is a conflict between text and tables on a feature described as optional, the table shall be accepted as being correct.

4.1.3 PC Card-ATA: This term describes an application specification for the implementation of ATA-like devices compatible with host systems implementing PCMCIA Type III slots.

4.1.4 Reserved: Where this term is used for bits, bytes, fields and code values; the bits, bytes, fields and code values are set aside for future standardization. The default value shall be zero. The originator is required to define a Reserved field or bit as zero, but the receiver should not check Reserved fields or bits for zero.

4.2 Conventions

Certain terms used herein are the proper names of signals. These are printed in uppercase to avoid possible confusion with other uses of the same words; e.g., ATTENTION. Any lower-case uses of these words have the normal American-English meaning.

A number of conditions, commands, sequence parameters, events, English text, states or similar terms are printed with the first letter of each word in uppercase and the rest lower-case; e.g., In, Out, Request Status. Any lower-case uses of these words have the normal American-English meaning.

The American convention of numbering is used i.e., the thousands and higher multiples are separated by a comma and a period is used as the decimal point. This is equivalent to the ISO convention of a space and comma.

American:	0.6	ISO:	0,6
	1,000		1 000
	1,323,462.9		1 323 462,9

5. 5.25" Magnetic Disk Drives Form Factors

This specification defines the configuration characteristics associated with 5.25" magnetic disk drives.

Table 5-1 defines the dimensions of the drive represented in Figure 5-1. References offset to the left in the dimensions column are variables, and those to the right are tolerances.

EDITORS NOTE: The figure needs to be modified to be in line with SFF labeling practics i.e. labeling Different heights as A1 and A2 and A3 deviates from SFF Style because the table clearly shows that A1 is a variable. If the other dimensions are renamed, the table will be adjusted accordingly.

TABLE 5-1 5.25" DISK DRIVE DIMENSIONS

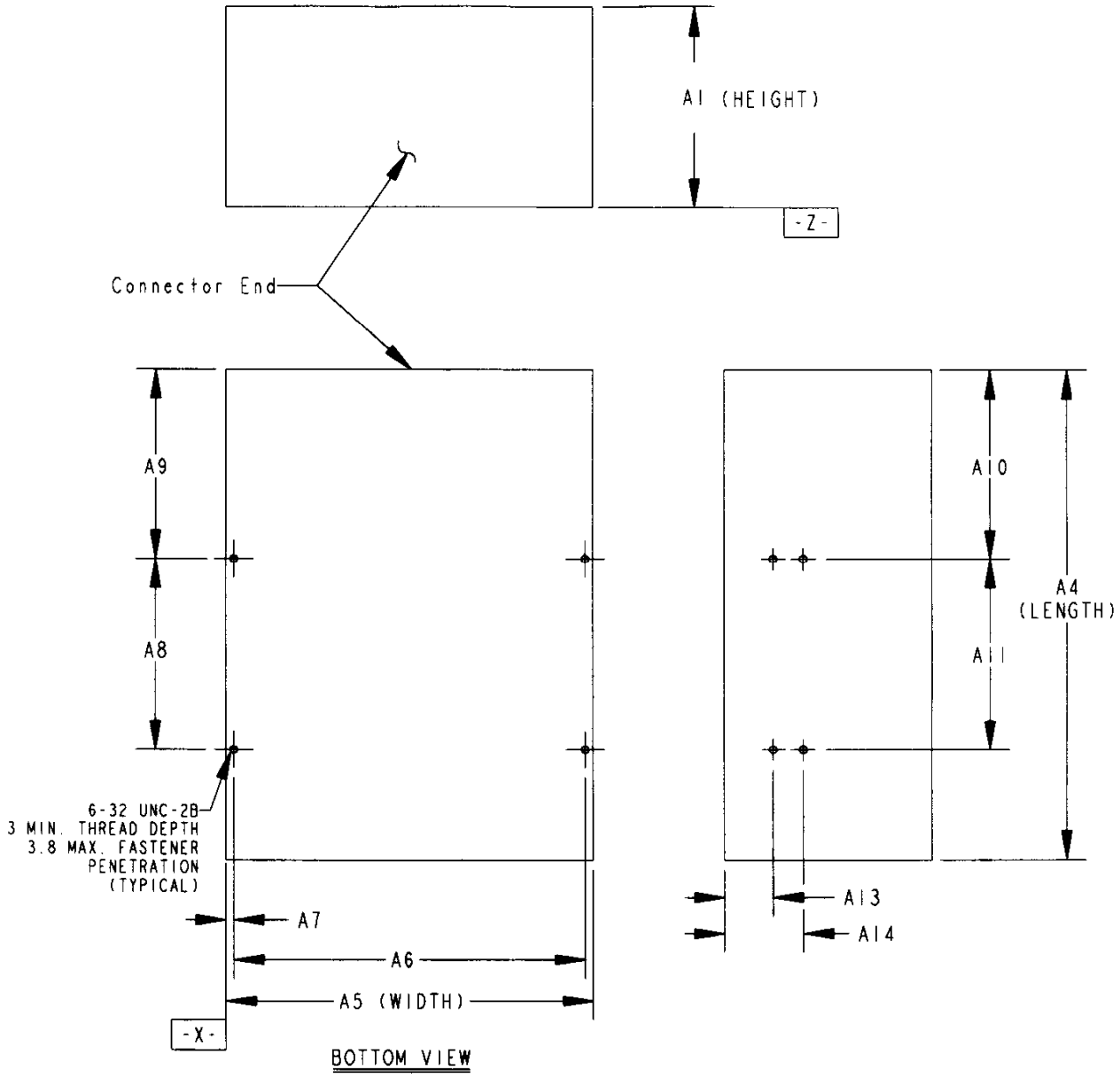
Dimension	Millimeters	Inches
A 1	82.55 *	3.250 *
A 1	*	.000 *
A 1	*	.000 *
A 4	204.72	8.060
A 5	146.05	5.750
A 6	139.70	5.500
A 7	3.05	.120
A 8	79.24	3.120
A 9	80.30	3.161
A10	80.20	3.157
A11	79.24	3.120
A12		.000
A13	9.91	.390
A14	21.84	.860

* = maximum

NOTE: Tolerances are +/-0.25mm (0.010").

In Specifications under review, the figures are not integrated with the text but follow behind its transmittal. Space has been left here so the figure can be pasted in the proper position.

FIGURE 5-1 FORM FACTOR OF 5.25" DISK DRIVE



SFF-8501 Form Factor of 5 1/4" Disk Drive