SFF Committee

SFF-8508 Specification for

ATAPI CD-ROM with Audio Connectors

EXPIRED

This specification has been incorporated as a standard of the Electronic Industries Association, and can be purchased through Global Engineering (303-792-2181) in hard copy form as EIA-741.

The SFF practice of making Expired Specifications unavailable has been modified for cases where the information is unavailable in an electronic format.

EIA standards and draft standards are not available electronically, so the SFF is continuing to provide this revision of the specification. Be aware that if any changes were made during the EIA approvals process, they are not reflected in this copy.

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

SFF Committee

SFF-8508 Specification for

ATAPI CD-ROM with Audio Connectors

Rev 1.1   June 5, 1995

Secretariat: SFF Committee

Abstract: This document defines the dimensions for 3.5" magnetic disk drives.

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
                   Sigmax
                   Western Digital

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

                   Methode

If you are not a member of the SFF Committee, but you are interested in participating, the following principles have been reprinted here for your information.

PRINCIPLES OF THE SFF COMMITTEE

The SFF Committee is an ad hoc group formed to address storage industry needs in a prompt manner. When formed in 1990, the original goals were limited to defining de facto mechanical envelopes within which disk drives can be developed to fit compact computer and other small products.

Adopting a common industry size simplifies the integration of small drives (2 1/2" or less) into such systems. Board-board connectors carrying power and signals, and their position relative to the envelope are critical parameters in a product that has no cables to provide packaging leeway for the integrator.

In November 1992, the SFF Committee objectives were broadened to encompass other areas which needed similar attention, such as pinouts for interface applications, and form factor issues on larger disk drives. SFF is a forum for resolving industry issues that are either not addressed by the standards process or need an immediate solution.

Documents created by the SFF Committee are expected to be submitted to accredited standards bodies such as EIA (Electronic Industries Association) or ASC (Accredited Standards Committee) X3T9. They may be accepted for separate standards, or incorporated into other standards activities.

The principles of operation for the SFF Committee are not unlike those of an accredited standards committee. There are 3 levels of participation:

- Attending the meetings is open to all, but taking part in discussions is limited to member companies, or those invited by member companies
- The minutes and copies of material which are discussed during meetings are distributed only to those who sign up to receive documentation.
- The individuals who represent member companies of the SFF Committee receive documentation and vote on issues that arise. Votes are not taken during meetings, only guidance on directions. All voting is by letter ballot, which ensures all members an equal opportunity to be heard.

Material presented at SFF Committee meetings becomes public domain. There are no restrictions on the open mailing of material presented at committee meetings. In order to reduce disagreements and misunderstandings, copies must be provided for all agenda items that are discussed. Copies of the material presented, or revisions if completed in time, are included in the documentation mailings.

The sites for SFF Committee meetings rotate based on which member companies volunteer to host the meetings. Meetings have typically been held on the first day of the X3T9 Working Group weeks (the third week of odd months).

The funds received from the annual membership fees are placed in escrow, and are used to reimburse ENDL for the services to manage the SFF Committee.

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.

    Name: _____ Title: _____

  Company: _____

  Address: _____

         _____

    Phone: _____ Fax: _____

    Email: _____

    Please register me with the SFF Committee for one year.

    ___ Voting Membership w/Electronic documentation $ 2,160

    ___ 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 #: _____

    MC/Visa/AmX_____ Expires_____

      SFF Committee   408-867-6630
      14426 Black Walnut Ct   408-867-2115Fx
      Saratoga CA 95070   endlcom@acm.org

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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FIGURES

TABLES

    SFF Committee --

    ATAPI CD-ROM with Audio Connectors

1. Scope

The 83xx suite of specifications defines the configuration characteristics
associated with 3.5" disk drives.

The purpose of the 83xx suite is to define the external characteristics of
drives 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 in the
systems integration of small form factor disk drives.

 - SFF-8300 contains general information regarding connector space, mounting
   considerations and measurement requirements.
 - SFF-8301 defines the dimensions of 3.5" disk drives.
 - Other specifications in the 83xx family define the location of connectors
   on 3.5" disk drives.

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
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 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

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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
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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.

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        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. Location of Cabled Connectors on ATAPI CD-ROMs

This specification defines the configuration characteristics associated with
the location of connetors on ATAPI (ATA Packet Interface) CD-ROMs.

The connectors, including audio, are located in the same relative position.

The connectors are located at the rear of the drive, as specified in SFF-8551.
Retaining the same relative location simplifies cabling for the integrator.
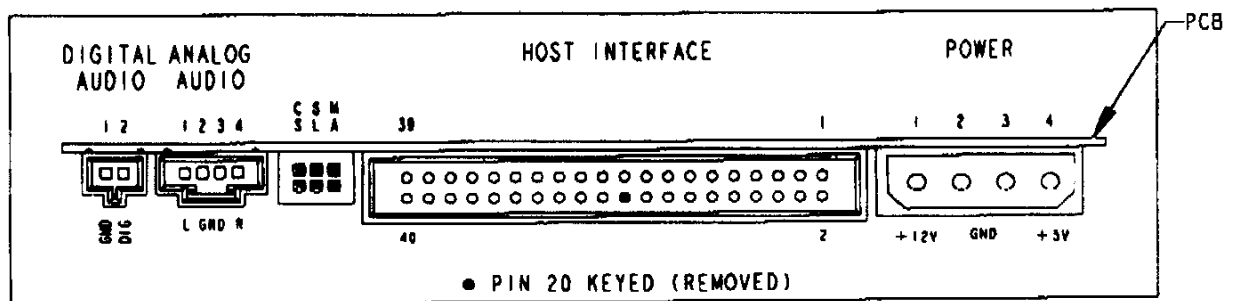
No matter whether the unpolarized connectors are located on the top as in
Figure 5-1, or bottom as in Figure 5-2, of the circuit board, they always have
the same orientation. This is not required for the polarized connectors.

FIGURE 5-1 CONNECTORS MOUNTED ON TOP OF PCB

FIGURE 5-2 CONNECTORS MOUNTED ON BOTTOM OF PCB
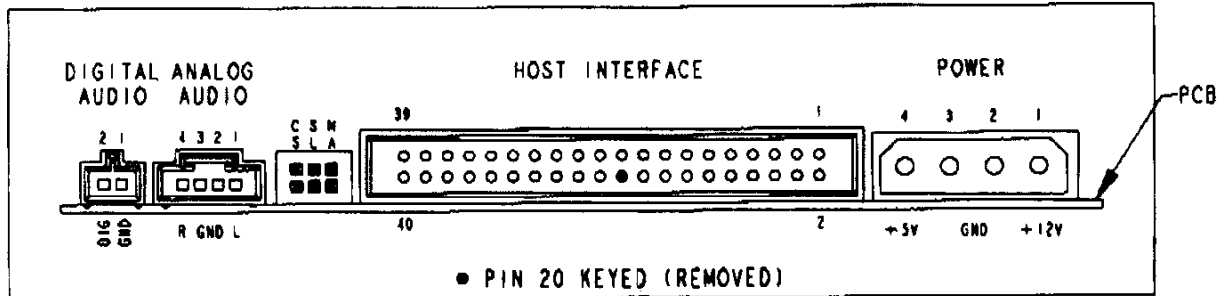
CONNECTORS ON TOP OF PCB

CONNECTORS ON BOTTOM OF PCB

CONNECTOR END

SFF-8508 ATAPI CD-ROM Connectors