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

SFF Committee documentation may be purchased in hard copy or electronic form.
SFF Specifications are available at fission.dt.wdc.com/pub/standards/sff/spec

SFF Committee

SFF-8072 Specification for

80-pin Fibre Channel Tape Connector

Rev 1.2 November 12, 1999

Secretariat: SFF Committee

Abstract: This document specifies a connector and defines the signals and contact assignments for an FC-TAPE compliant tape drive of approximately the 5.25" form factor to connect to a backplane or interface card.

This document provides a common specification for systems manufacturers, system integrators, and suppliers of components in the referenced area. 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.

POINTS OF CONTACT:

Stewart Wyatt
Hewlett Packard
POB 15 #477
Boise, ID 83714

Ph: 208-396-3594
Fx: 208-396-3319Fx
Email: stewart_wyatt@hp.com

I. Dal Allan
Chairman SFF Committee
ENDL
14426 Black Walnut Court
Saratoga CA 95070
Ph: 408-867-6630
Fx: 408-867-2115
250-1752@mcimail.com

EXPRESSION OF SUPPORT BY MANUFACTURERS

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

Adaptec
AMP
Amphenol
Compaq
DDK Fujikura
ENDL
FCI/Berg
Fujitsu CPA
Hitachi Cable
Quantum
Robinson Nugent
Seagate
TI Japan
Toshiba America
Tyco AMP
Unisys
Yamagata Fujitsu

The following member companies of the SFF Committee voted to abstain on this industry specification.

DDK Electronics
Foxconn Int'l
Honda Connector
IBM
Matsushita
Maxtor
Molex
Montrose/CDT
Pioneer NewMedia
Sun Microsystems
Thomas & Betts
YC Cable

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 bodies such as EIA (Electronic Industries Association) or an ASC (Accredited Standards Committee). 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 during the ASC T10 weeks.

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.

Annual SFF Committee Membership Fee	$ 1,800.00
Annual SFF Committee Paper Documentation Fee	$ 300.00
Annual Surcharge for AIR MAIL to Overseas	$ 100.00
Annual Surcharge for Electronic Documentation	$ 360.00

Name: _____

Title: _____

Company: _____

Address: _____

_____

_____

Phone: _____

Fax: _____

Email: _____

Please register me as a Member of the SFF Committee for one year.

Paper documentation	$ 1,800
Electronic documentation	$ 2,160

Check Payable to SFF Committee for $_____ is Enclosed

Please invoice me $_____ on PO #: _____

MC/Visa/AmX_____ Expires_____

Please register me as an Observer on the SFF Committee for one year.

Paper documentation	$ 300 U.S.	$ 400 Overseas
Electronic documentation	$ 660 U.S.	$ 760 Overseas

Check Payable to SFF Committee for $_____ (POs Not Accepted)

MC/Visa/AmX_____ Expires_____

SFF Committee
14426 Black Walnut Ct
Saratoga CA 95070

408-867-6630
408-867-2115Fx
250-1752@mcimail.com

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 a mix of companies which are leaders across the industry.

TABLE OF CONTENTS

TABLES

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 a mix of companies which are leaders across the industry.

TABLE OF CONTENTS

TABLES

SFF Committee --

80-pin Fibre Channel Tape Connector

1. Scope

In an effort to broaden the applications for small form factor disk drives, an ad hoc industry group of companies representing system integrators, peripheral suppliers, and component suppliers decided to address the issues involved.

The purpose of this specification is to define the signals and contact assignments for an FC-TAPE compliant tape drive of approximately the 5.25" form factor to connect to a backplane or interface card.

This specification leverages SFF-8045 and SFF-8067, which use a 40-pin connector designed for 3.5" form factor disk drives, but lacks adequate power supply capability for larger form factor tape drive applications.

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 contains the signal definitions

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 this Specification.

- T10/1302 SPI-3 (SCSI Parallel Interface -3)
- T11/1315 FC-Tape (Tape and Tape Medium Changers)
- SFF-8045 40-pin SCA-2 Connector w/Parallel Selection
- SFF-8067 40-pin SCA-2 Connector w/Bidirectional ESI
- EIA-700A0AE SFF-8451 SCA-2 Unshielded Connections

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.
e = electronic	Used as a suffix to indicate an SFF Specification which has Expired but is still available in electronic form from SFF e.g. a specification has been incorporated into a draft or published standard which is only available in hard copy.
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 November 21, 1999
SFF-8000		SFF Committee Information
SFF-8001i	E	44-pin ATA (AT Attachment) Pinouts for SFF Drives
SFF-8002i	E	68-pin ATA (AT Attachment) for SFF Drives
SFF-8003	E	SCSI Pinouts for SFF Drives
SFF-8004	E	Small Form Factor 2.5" Drives
SFF-8005	E	Small Form Factor 1.8" Drives
SFF-8006	E	Small Form Factor 1.3" Drives
SFF-8007	E	2mm Connector Alternatives
SFF-8008	E	68-pin Embedded Interface for SFF Drives
SFF-8009	4.1	Unitized Connector for Cabled Drives
SFF-8010	E	Small Form Factor 15mm 1.8" Drives
SFF-8011i	E	ATA Timing Extensions for Local Bus
SFF-8012	2.3	4-Pin Power Connector Dimensions
SFF-8013	E	ATA Download Microcode Command
SFF-8014	C	Unitized Connector for Rack Mounted Drives
SFF-8015	E	SCA Connector for Rack Mounted SFF SCSI Drives
SFF-8016	C	Small Form Factor 10mm 2.5" Drives
SFF-8017	E	SCSI Wiring Rules for Mixed Cable Plants
SFF-8018	E	ATA Low Power Modes
SFF-8019	E	Identify Drive Data for ATA Disks up to 8 GB
INF-8020i	E	ATA Packet Interface for CD-ROMs
SFF-8028i	E	- Errata to SFF-8020 Rev 2.5
SFF-8029	E	- Errata to SFF-8020 Rev 1.2
SFF-8030	1.8	SFF Committee Charter
SFF-8031		Named Representatives of SFF Committee Members
SFF-8032	1.4	SFF Committee Principles of Operation

SFF-8033i	E	Improved ATA Timing Extensions to 16.6 MBs
SFF-8034i	E	High Speed Local Bus ATA Line Termination Issues
SFF-8035i	E	Self-Monitoring, Analysis and Reporting Technology
SFF-8036i	E	ATA Signal Integrity Issues
INF-8037i	E	Intel Small PCI SIG
INF-8038i	E	Intel Bus Master IDE ATA Specification
SFF-8039i	E	Phoenix EDD (Enhanced Disk Drive) Specification
SFF-8040	1.2	25-pin Asynchronous SCSI Pinout
SFF-8041	C	SCA-2 Connector Backend Configurations
SFF-8042	C	VHDCI Connector Backend Configurations
SFF-8043	E	40-pin MicroSCSI Pinout
SFF-8045	4.2	40-pin SCA-2 Connector w/Parallel Selection
SFF-8046	E	80-pin SCA-2 Connector for SCSI Disk Drives
SFF-8047	C	40-pin SCA-2 Connector w/Serial Selection
SFF-8048	C	80-pin SCA-2 Connector w/Parallel ESI
SFF-8049	E	80-conductor ATA Cable Assembly
INF-8050i	1.0	Bootable CD-ROM
INF-8051i	E	Small Form Factor 3" Drives
INF-8052i	E	ATA Interface for 3" Removable Devices
SFF-8053	5.4	GBIC (Gigabit Interface Converter)
INF-8055i	E	SMART Application Guide for ATA Interface
SFF-8056	C	50-pin 2mm Connector
SFF-8057	E	Unitized ATA 2-plus Connector
SFF-8058	E	Unitized ATA 3-in-1 Connector
SFF-8059	E	40-pin ATA Connector
SFF-8060	1.1	SFF Committee Patent Policy
SFF-8061	1.1	Emailing drawings over the SFF Reflector
SFF-8065	C	40-pin SCA-2 Connector w/High Voltage
SFF-8066	C	80-pin SCA-2 Connector w/High Voltage
SFF-8067	2.6	40-pin SCA-2 Connector w/Bidirectional ESI
INF-8068i	1.0	Guidelines to Import Drawings into SFF Specs
SFF-8069	E	Fax-Access Instructions
INF-8070i	1.2	ATAPI for Rewritable Removable Media
SFF-8072	1.2	80-pin SCA-2 for Fibre Channel Tape Applications
SFF-8073	-	20-pin SCA-2 for GBIC Applications
SFF-8080	E	ATAPI for CD-Recordable Media
SFF-8090	3.6	ATAPI for DVD (Digital Video Data)
SFF-8200e	1.1	2 1/2" drive form factors (all of 82xx family)
SFF-8201e	1.3	2 1/2" drive form factor dimensions
SFF-8212e	1.2	2 1/2" drive w/SFF-8001 44-pin ATA Connector
SFF-8300e	1.1	3 1/2" drive form factors (all of 83xx family)
SFF-8301e	1.2	3 1/2" drive form factor dimensions
SFF-8302e	1.1	3 1/2" Cabled Connector locations
SFF-8332e	1.2	3 1/2" drive w/80-pin SFF-8015 SCA Connector
SFF-8337e	1.2	3 1/2" drive w/SCA-2 Connector
SFF-8342e	1.3	3 1/2" drive w/Serial Unitized Connector
SFF-8400	C	Very High Density Cable Interconnect
SFF-8410	12.1	High Speed Serial Testing for Copper Links

SFF-8411	-	High Speed Serial Testing for Backplanes
SFF-8412	-	HSS Requirements for Duplex Optical Links D
SFF-8420	10.1	HSSDC-1 Shielded Connections
SFF-8430	4.1	MT-RJ Duplex Optical Connections
SFF-8441	14.1	VHDCI Shielded Configurations
SFF-8451	10.1	HSS (High Speed Serial) SCA-2 Connections
SFF-8480	2.1	HSS (High Speed Serial) DB9 Connections
SFF-8500e	1.1	5 1/4" drive form factors (all of 85xx family)
SFF-8501e	1.1	5 1/4" drive form factor dimensions
SFF-8508e	1.1	5 1/4" ATAPI CD-ROM w/audio connectors
SFF-8551	2.0	5 1/4" CD-ROM 1" High form factor
SFF-8572	-	5 1/4" Tape form factor
SFF-8610	C	SDX (Storage Device Architecture)

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 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

The increasing size of SFF Specifications has made FaxAccess impractical to obtain large documents. Document subscribers and members are automatically updated every two months with the latest specifications. Specifications are available by FTP at fission.dt.wdc.com/pub/standards/sff/spec

Electronic copies of documents are also made available via CD_Access, a service which provides copies of all the specifications plus SFF reflector traffic. CDs are mailed every 2 months as part of the document service, and provide the letter ballot and paper copies of what was distributed at the meeting as well as the meeting minutes.

3. General Description

This SFF specification leverages SFF-8045 and SFF-8067, which use a 40-pin connector designed for 3.5" form factor disk drives, but lacks adequate power supply capability for larger form factor tape drive applications.

The 80-pin connector is the SPI-3 'nonshielded alternate 4 connector' which is specified in EIA-700A0AE and SFF-8451. If a SCSI disk drive is connected to a position which was designed for a Fibre Channel tape drive, the SCSI disk drive will be probably be damaged because of the additional power voltages of SFF-8072. The protection against mixing the two applications is the form factor difference. This standard is to be used exclusively with products that are of the 5 1/4" form factor while the SCSI connector has only been implemented in 3 1/2" products.

The 12V power supply capability was augmented by using the 3.3V contact positions which have not been implemented by either Fibre Channel or SCSI disk drives. Additional 12V power supply capability was provided by assigning power and ground to a set of pins that are used for signals in the SCSI connector. Use of these pins will cause damage if the SCSI and Fibre Channel applications are mixed.

Unless noted otherwise, all the SFF-8067 signals have been included in the same relative position as they occur in the 40-pin connector.

An interface has been included to allow a tape drive to communicate with a library controller using RS-422 and various control signals.

4. Definitions and Conventions

4.1 Definitions

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

4.1.1 Backplane: The components of the enclosure that mechanically support the SCA connector and create or route the required signals and power to the SCA connector from the enclosure. The backplane may be a true multi-device backplane, a paddle card inserted in a host computer, a paddle card attached to an appropriately designed cable, or any component with similar capabilities.

4.1.2 Drive: The peripheral that plugs into the backplane or adapter card using the SCA-2 connector. The peripheral may be any device of any type that meets one of the standard 5 1/4" form factors and establishes its connection to the FC-AL through a standard 80 position SCA-2 connector.

4.1.3 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.

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.

4.1.5 VU (Vendor Unique): This term is used to describe bits, bytes, fields, pins, signals, code values and features which are not described in this SFF Specification, and may be used in a way that varies between vendors.

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. Signals

Unless described below, all signals are defined in SFF-8067.

5.1 Signal Assignments

The signal pinout is shown in Table 5-1.

TABLE 5-1 FIBRE CHANNEL TAPE SIGNAL ASSIGNMENTS

80-pin SFF-8072 Connector Contact and Signal Name	Driven by Backplane/Drive		80-pin SFF-8072 Connector Contact and Signal Name
1 12V CHARGE *1 (L)	B	B	(L) *1 12V GROUND 41
2 12 VOLTS *1 (S)	B	B	(L) *1 12V GROUND 42
3 12 VOLTS *1 (S)	B	B	(L) *1 12V GROUND 43
4 12 VOLTS *1 (S)	B	D	(S) *6 MATED 2 44
5 12 VOLTS *2 (S)	B	B	(L) *4 12V GROUND 45
6 12 VOLTS *2 (S)	B	B	(L) *3 12V GROUND 46
7 12 VOLTS *5 (S)	B	D	(S) *7 -DRIVE_ATN 47
8 12 VOLTS *5 (S)	B	B	(S) *7 -LIB_RST 48
9 12 VOLTS *5 (S)	B	B	(S) *7 -LIB_SEN 49
10 12 VOLTS *5 (S)	B	D	(S) *7 -LIB_DRV_SEN 50
11 12V GROUND *5 (S)	B	D	(S) *7 +LIB_TX 51
12 12V GROUND *5 (S)	B	D	(S) *7 -LIB_TX 52
13 12V GROUND *5 (S)	B	B	(S) *7 -LIB_RX 53
14 12V GROUND *5 (S)	B	B	(S) *7 +LIB_RX 54
15 12V GROUND *5 (S)	B		(S) reserved 55
16 -ENBL BYP CH1 (S)	D	B	(S) *4 5V GROUND 56
17 -PARALLEL ESI (S)	D	B	(S) +PORT 1_IN 57
18 READY LED (S)	D	B	(S) - PORT 1_IN 58
19 POWER CONTROL (S)	B	B	(S) *4 5V GROUND 59
20 -ENBL BYP CH2 (S)	D	B	(S) +PORT 2_IN 60
21 SEL_6 / -DSK_WR (S)	B/D	B	(S) -PORT 2_IN 61
22 SEL_5 / -DSK_RD (S)	B/D	B	(S) *4 5V GROUND 62
23 SEL_4 / -INCL_ACK (S)	B	D	(S) +PORT 1_OUT 63
24 SEL_3 / D(3 (S)	B/D	D	(S) -PORT 1_OUT 64
25 FAULT LED (S)	D	B	(S) *4 5V GROUND 65
26 DEVICE CONT 2 (S)	B	D	(S) +PORT 2_OUT 66
27 DEVICE CONT 1 (S)	B	D	(S) -PORT 2_OUT 67
28 5 VOLTS *4 (S)	B	B	(S) *4 5V GROUND 68
29 5 VOLTS *4 (S)	B	B/D	(S) SEL_2 / D(2 69
30 5 VOLTS *4 (S)	B	B/D	(S) SEL_1 / D(1 70
31 5 VOLTS *4 (S)	B	B/D	(S) SEL_0 / D(0 71
32 5 VOLTS *4 (S)	B	B	(S) DEVICE CONT 0 72
33 5 VOLTS *4 (S)	B	B	(S) *4 5V GROUND 73
34 5 VOLTS *1 (S)	B	B	(S) *6 MATED 1 74
35 5 VOLTS *1 (S)	B	B	(L) *1 5V GROUND 75
36 5V CHARGE *1 (L)	B	B	(L) *1 5V GROUND 76
37 reserved (L)			(L) reserved 77
38 RMT_START *6 (L)	B	B	(L) *6 DLYD_START 78
39 5V GROUND *4 (L)	B	B	(L) *4 5V GROUND 79
40 5V GROUND *4 (L)	B	B	(L) *4 5V GROUND 80

*1 See 5.2 *4 See 5.5 *5 See 5.6 *7 See 5.8
*2 See 5.3 *3 See 5.4 *6 See 5.7
Guide pins: Connected to GROUND (5V) on backplane and device.
L = Long backplane pin length S = Short backplane pin length

5.2 Power Pins

The location of these power supply pins match the SCSI SPI unshielded alternative 4 connector assignments.

5.3 3.3V Pins

The SCSI alternative connector positions for 3.3V has been changed to 12V to provide additional power supply capability.

5.4 DIFFSNS

Pin 46 is assigned to be a 12V GROUND. In the SCSI LVD/MSE contact assignment, this pin is the DIFFSNS. If a SCSI HVD or LVD drive is accidentally plugged into a Fibre Channel slot, this assignment will cause the differential drivers to be disabled.

5.5 Additional 5 Volt Power

These pins are used to provide additional power supply capability to meet the needs of Fibre Channel tape drives which will typically be of a larger form factor and have greater power supply requirements than the disk drives that the SFF-8067 or SPI-3 alternate 4 specifications allowed. These assignments are made using positions that are used for signals in the SCSI standard. The 5 Volts power pins exceeds the maximum input voltage rating defined in SPI-3 for LVD inputs and SE inputs with active negation.

5.6 Additional 12 Volt Power

These pins are used to provide additional 12 Volt power capability to meet the needs of Fibre Channel tape drives. These positions are used for signals in the SCSI standard. Using these pins for 12 Volt power will cause damage if the interface types are mixed.

5.7 Mated Pin Condition

The -DRIVE PRESENT, START_1/MATED and START_2/MATED signals described in SFF-8067 are being replaced with the MATED_1, MATED_2, RMT_START and DLYD_START signals defined in the SPI-3 alternate 4 connector which are defined in Annex C of SPI-3.

While the RMT_START and DLYD_START signals are in the same position as defined in the SPI-3 alternate 4 contact assignments, the position of the MATED_1 and MATED_2 contacts have been reversed. This prevents a SCSI or Fibre Channel drive from coming ready when plugged into the incorrect backplane. Fibre Channel drives compliant with FC-AL-2 should not enable their transmitters until they have properly mated to prevent damage when inserted into a SCSI backplane.

5.8 Library Signals

The library signals define a connection to a library interface as shown in Table 5-2.

TABLE 5-2 LIBRARY CONNECTION SIGNALS

Signal Name	Signal Description	Driven By
-DRIVE_ATN	Set low by the drive when it wants attention from the library controller.	Drive
-LIB_RST	Hard reset. Optional capability for the library controller to reset the drive.	Library

-LIB_SEN	If held low by the library, the drive will not appear on Fibre Channel until commanded to.	Library
-LIB_DRV_SEN	Tied low on drive, so library can detect if the drive is present.	Drive
+LIB_TX -LIB_TX	RS-422 transmit.	Drive
-LIB_RX +LIB_RX	RS-422 receive.	Library

The characteristics of the signals are defined in Table 5-3, Table 5-4 and Table 5-5.

TABLE 5-3 OUTPUT CHARACTERISTICS OF LIBRARY CONNECTION SIGNALS

State	Current Drive Available	Output Voltage
HIGH	-100 uA < IOH < 100uA	0 < VOH < 5.25V
LOW	IOL > 2 mA	0 < VOL < 0.5V

TABLE 5-4 INPUT CHARACTERISTICS OF LIBRARY CONNECTION SIGNALS

State	Current	VOLTAGE
OPEN	-20 uA < IIH < 20 uA	2.2V < VIH < 5.25V
GROUND	IOL > 2 mA	-0.5V < VIL < 0.7V

TABLE 5-5 RS-422 ABSOLUTE MAXIMUM RATINGS

RECEIVER INPUT VOLTAGE	-7.5V to 12.5V
DRIVER OUTPUT VOLTAGE	-7.5V to 12.5V