



July 11, 1991

X3T9.2/91-64 REV 1

TO: X3T9.2 Committee

FROM: David Steele

SUBJ: Fast Single-Ended and Other Recommended Changes to
SCSI-3 Parallel Interface

5.1 Physical Description

Add to end of second paragraph - When mixing SCSI devices of different widths, care must be taken not to exceed the skew allowances provided by the Cable Skew Delay and Deskew Delay SCSI bus timing values. To accomplish this may require restricting SCSI device input capacitance, stub length, and cable length to less than the specified maximum allowable value and may also require close adherence to the cable recommendations made in section 5.2. The mixing of different width SCSI devices using the fast synchronous data transfer option is not recommended.

Modify third paragraph to read - Three driver/receiver alternatives are specified:

- (1) Single-ended ...
- (2) Differential ...
- (3) Fast single-ended drivers and receivers, which allow limited support of the fast synchronous data transfer option over a maximum cable length of 3 meters (primarily for connection within a cabinet).

Modify last sentence of fourth paragraph to read - Use of single-ended drivers and receivers with the fast synchronous data transfer option is recommended only for a restricted set of conditions.

5.2.3 Cable Requirements for Fast Synchronous Data Transfer

Modify characteristic impedance to read -
Characteristic Impedance: 80 to 100 ohms

Add new section -

5.2.3.1 Cable Requirements for Single-Ended Fast Synchronous Data Transfer

In single ended systems which use the fast synchronous data transfer option, cables shall conform to recommendations in 5.2, 5.2.1, and 5.2.3.

6.1 Single-Ended Alternative

Modify last sentence to read - Alternative 2 termination is recommended for better signal quality and is required for systems which use the fast synchronous data transfer option.

Add new section -

6.1.1.1 Fast Single-Ended Output Characteristics

In addition to conforming to the specifications in 6.1.1, single-ended systems which use the fast synchronous data transfer option shall have the following output characteristics when measured at the SCSI device's connector:

all signals;
Slew Rate \leq 0.5 volts/ns

REQ and ACK signals;
At a minimum, the ACK and REQ signals shall use three state drivers with the following electrical characteristics:

V_{OH} (High-level output voltage) = 2.5 to 5.25 volts dc at 4 mA sourcing (signal negation)

To minimize the power consumed in the terminators, it is recommended that V_{OH} not exceed 3.5 volts.

6.1.2 Single-Ended Input Characteristics

In order to support more than 8 SCSI devices on a cable, the I_{IL} and I_{IH} specification should be changed as follows:

I_{IL} (Low-level input current) = -20 to 0 uA at $V_I = 0.5$ volts dc
 I_{IH} (High-level input current) = 0 to 20 uA at $V_I = 2.7$ volts dc

Add new section -

6.1.2.1 Fast Single-Ended Input Characteristics

In addition to conforming to the specifications in 6.1.2, single-ended systems which use the fast synchronous data transfer option shall have the following electrical characteristics:

all signals;
Minimum input hysteresis = 0.3 volts dc

REQ and ACK signals;
The SCSI receiver shall not change logic state as a result of an input signal pulse of amplitude less than or equal to 1.0 volts and is of less than or equal to 5 ns in duration.

6.2 SCSI Bus

Add to first paragraph - When more than 8 SCSI devices are used on a cable, signal quality may be degraded. Maintaining acceptable signal quality may require restricting SCSI device input capacitance, stub length, and cable length to less than the specified maximum allowable value and may also require close adherence to the cable recombinations made in section 5.2. Putting more than 8 SCSI devices on a single-ended cable using the fast synchronous data transfer option is not recommended.

7 SCSI Parallel Bus timing

Modify Table 12: SCSI Bus Timing Values to add column for SE Fast Timing Value.

<u>Timing Description</u>	<u>Timing Value</u>	<u>Fast timing Value</u>	<u>SE Fast Timing Value</u>
Deskew Delay	45ns	20ns	10ns
Fast SE Data Settle Delay	NA	NA	20ns

Add new section -

7.16 Fast SE Data Settle Delay

The minimum time to wait for the bus to settle after changing the DATA BUS signals as called out in the protocol definitions.

8.1.6.2 Synchronous Data Transfer

Add to fifth paragraph following first sentence - In single-ended systems which use the fast synchronous data transfer option, the target shall first drive the DB(7-0,P) signals to their desired values, wait at least one fast SE data settle delay plus one deskew delay plus one cable skew delay, then assert the REQ signal.

Add to sixth paragraph following second sentence - In single-ended systems which use the fast synchronous data transfer option, the initiator shall first drive the DB(7-0,P) signals to their desired values, wait at least one fast SE data settle delay plus one deskew delay plus one cable skew delay, then assert the ACK signal.