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Date: 7 May 92  
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To: X3T9.2 Membership  
Subj: Transceiver skew recommendations

I received a memo from John Goldie (National Semiconductor) which pointed out the following:

1. We can't guarantee all data and handshake transceivers are operating within 5 degrees C of one another until an 11-signal chip comes out for 8-bit SCSI (or a 20-signal chip for 16-bit SCSI).
2. There can be significant power dissipation differences from package to package, depending on which signals are active.

Therefore, the 6ns skew desired of these parts will probably not be achievable over the entire temperature range. At the last meeting we took 5ns out of the skew budget for the cable plant. However, I believe this needs to be renegotiated. The maximum skew budget that the best silicon available can tolerate is 30ns, which means the entire cable plant (skew plus distortion) must be no greater than 8ns:

|                             |      |                     |
|-----------------------------|------|---------------------|
| TX foil delays:             | 1ns  |                     |
| External transmitter delay: | 10ns |                     |
| -----                       |      | TX Connector        |
| Cable plant                 | 8ns  |                     |
| -----                       |      | RX Connector        |
| External receiver delay:    | 10ns |                     |
| RX foil delays              | 1ns  |                     |
|                             |      | <b>Total = 30ns</b> |

### Summary and Recommendations:

1. TX chip values must be 30ns larger than RX chip values in order to operate differentially at Fast SCSI speeds with 25m of cable.
2. 30ns is achievable by at least two silicon vendors, but not achievable by at least two others. The **recommended** chip specs which meet the 30ns budget should be documented as:

TX chip setup = 35ns<sup>33</sup>      RX chip setup = 5ns  
TX chip hold = 45ns      RX chip hold = 15ns

3. At the connector, the TX and RX chip times must differ by no more than 8ns (cable delay + distortion). The **required** connector specs should therefore be:

TX setup = 24ns      RX setup = 16ns  
TX hold = 34ns      RX hold = 26ns