PC-MIP Link Receiver Board (LRB) and Link Transmitter Board (LTB)
Required Design Updates

September 26, 2000
E. Hazen

This note lists features of the LRB/LTB which were omitted in the first prototypes, and a rough priority for implementing them.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Status</th>
<th>Priority</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamming Error Correction</td>
<td>Not implemented</td>
<td>1</td>
<td>LTB may be okay</td>
</tr>
<tr>
<td>Block Counting</td>
<td>Not working</td>
<td>1</td>
<td>See note [1]</td>
</tr>
<tr>
<td>Merge Mode</td>
<td>Not tested</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Protocol Error Handling</td>
<td>Not implemented</td>
<td>1</td>
<td>See note [2]</td>
</tr>
<tr>
<td>Monitoring Counters</td>
<td>Not implemented</td>
<td>2</td>
<td>See note [3]</td>
</tr>
<tr>
<td>FIFO flag actions</td>
<td>Not implemented</td>
<td>2</td>
<td>See note [4]</td>
</tr>
</tbody>
</table>

Notes:

1. Essentially this is an up-down counter for each channel.
   a. Count UP on receipt of complete block (Header, Data, Trailer)
   b. Count DOWN on read-out over PCI of complete block
   c. Provide a status register with the current count
   d. Provide a status signal when at least 1 block is present

2. Check for (Header, Data, Trailer) block structure. If an error is seen:
   a. Increment an error counter
   b. Set a status bit to show the error
   c. Insert missing header or trailer to make a complete block

3. Provide several counters for monitoring link operation:
   a. Count of words received
   b. Count of corrected and uncorrected link data errors
   c. Count of protocol errors (see note 2)
   Each counter requires in addition a storage register. On “update status” command, copy counter values to storage registers. “Update status” may be performed:
      - on command by PCI
      - when specific bit is set in header of data block received

4. Several actions may be taken on the FIFO flags:
   a. If FIFO is full:
      - Set error bit in status register
      - Increment a monitoring counter
   b. If FIFO is “almost full”:
      - Set error bit in status register
- Increment a monitoring counter
- Stop storing “DATA” words (continue to store Header, Trailer)