MEMORANDUM

26 Jun 1987

To: John Lohmeyer, Chairman, X3T9.2

From: Bill Spence, Texas Instruments, Austin

Subject: Fourth pass at Download, etc., Command

At the X3T9.2 Plenary Meeting in Vancouver, 22-23 June, we discussed the microcode download protocol in the context of document no 87-7 Rev 2. The consensus achieved, as I understood it, was that the proposals of page 2, modified as per discussions at the meeting, and those proposals only, were agreed upon.

For the record, then, here is a cleaned-up version.
PROPOSALS:

In Snc. 7.2.3, WRITE BUFFER Command (p. 7-31), in byte 1 of the CDB, expand the
mode field to comprise 3 bits, 0-2.

In Snc. 7.2.3, WRITE BUFFER Command (p. 7-31), replace the first two paragraphs
and the table below the CDB with the following:

"The WRITE BUFFER command (Table 7__) is used in conjunction with the READ
BUFFER command as a diagnostic function for testing target memory and the SCSI
bus integrity. When used in a diagnostic mode, this command shall not alter
any medium of the target. Additional modes are provided for downloading exe-
cutable microcode and for downloading and saving executable microcode.

The function of this command and the meaning of the fields within the command
descriptor block depend on the contents of the mode field. The mode field is
defined as follows:

<table>
<thead>
<tr>
<th>DB(2)</th>
<th>DB(1)</th>
<th>DB(0)</th>
<th>Mode</th>
<th>Implementation Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Write combined header and data</td>
<td>Optional</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Vendor unique</td>
<td>Optional</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>Write data</td>
<td>Optional</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>Reserved</td>
<td>Optional</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>Download microcode</td>
<td>Reserved</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>Download microcode and save</td>
<td>Optional</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>Reserved</td>
<td>Optional</td>
</tr>
<tr>
<td>~</td>
<td>1</td>
<td>1</td>
<td>Reserved</td>
<td></td>
</tr>
</tbody>
</table>

In Snc. 7.2.3, WRITE BUFFER Command (pp. 7-31 & 7-32), make global replacements
as follows: Replace 00b by 000b, 01b by 001b, 10b by 010b, and 11b by 011b.

In Snc. 7.2.3, WRITE BUFFER Command (p. 7-32), append the following material at
the end of the present text:

"7.2.3.5. Download Microcode Mode (100b)

In this mode, vendor-unique executable microcode and/or control information
shall be transferred to the control memory space of the target. After a power
cycle or reset, the device operation shall revert to a vendor-unique condition.
The meanings of the buffer ID, buffer offset, and transfer length fields are
not specified by this standard and are not required to be zero-filled.

7.2.3.6. Download Microcode and Save Mode (101b)

This mode may be specified only in a command with the Link bit not set. If
this mode is specified in a command with the Link bit set, the target shall
return CHECK CONDITION status and shall set the sense key to ILLEGAL REQUEST.
In this mode, vendor-unique executable microcode and/or control information
shall be transferred to the control memory space of the target and, if the
download is completed successfully, also shall be saved in a non-volatile
memory space (semiconductor, disk, or other). The downloaded code shall then
be effective after each power cycle and reset until it is supplanted in another
Download Microcode and Save operation. The meanings of the buffer ID, buffer
offset, and transfer length fields are not specified by this standard and are
not required to be zero-filled.

7.2.3.7 Reserved Mode (110b and 111b)

This mode is reserved for future standardization."