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December 20, 2001

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To: Mark 5 Development Group

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Subject: Mark 5A Track Mapping

As described in Mark 5 Memo #5, the Mark 5A System will support two fan-out modes, to spread the data from 8 or 16 formatter 'track' outputs to 32 bit streams. This capability will provide 100% disc utilization when recording 8 or 16 'tracks' of data. The System will also support a fan-in mode, for recording all 64 Mark-IV tracks on Mark 5 disks at 1 Gb/s. This memo defines the mapping of VLBA or Mark IV tracks into FPDP bit streams.

Both the Mark 4 and the VLBA formatters can be configured to de-multiplex (fan-out) a single sampler sign or magnitude bit stream to 4 tape tracks. The BBC channel-to-formatter track-assignment conventions adopted by the VLBA for these fan-out modes are given in Tables 10-13 of Mark IV Memo #230. Table 10 of that memo shows one 2-bit channel ('CHAN a') fanned out to even tracks 2-16. For compatibility with this convention, in the 8-track mode, the Mark 5A input board will fan VLBA even tracks 2-16 into 32 bit streams, as shown in Table 1 on the next page. The 16-track mode will fan even tracks 2-32 into 32 bit streams, as shown in Table 2.

This track mapping requires that when using the 8-track mode, the data must be on even VLBA tracks 2-16 (VLBA group 0), and when using Mark 5A 16-track mode, the data to be recorded must be on even VLBA tracks (VLBA groups 0 and 2). When playing back 8-track or 16-track data to a Station Unit, the Mark 5A Output Board will duplicate the data on the unused tracks, as shown in Tables 1 and 2. In all modes except the 64-track mode, the stack 1 output data will be duplicated on stack 2.

In the 64-track mode, the Mark IV tracks will be fanned-in (time-multiplexed) to 32 FPDP bit streams, for recording on Mark 5 Disks at 1 Gb/s, as shown in Table 3. Tracks 2 from both head stack 1 and head stack 2 are multiplexed, in alternate bit order starting with track 2 stack 1 to FPDP bit stream 0, etc. Tracks 33 from both head stacks are similarly multiplexed to FPDP bit stream 31.

|  |    |    |    |    |    |    |    |    |
|--|----|----|----|----|----|----|----|----|
| Input Track                                | 2  | 4  | 6  | 8  | 10 | 12 | 14 | 16 |
| FPDP<br>Bit Stream                         | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
|  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
|  | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|  | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Output<br>Tracks<br>on both<br>head stacks | 2  | 4  | 6  | 8  | 10 | 12 | 14 | 16 |
|  | 3  | 5  | 7  | 9  | 11 | 13 | 15 | 17 |
|  | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
|  | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 |

Table 1. Mapping for 8-track mode

|  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Input Track                                | 2  | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
| FPDP<br>Bit Stream                         | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
|  | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Output<br>Tracks<br>on both<br>head stacks | 2  | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
|  | 3  | 5  | 7  | 9  | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 |

Table 2. Mapping for 16-track mode

|                        |      |
|------------------------|------|
| Mark IV Stack 1 Tracks | 2-33 |
| Mark IV Stack 2 Tracks | 2-33 |
| FPDP Bit Streams       | 0-31 |

Table 3. Mapping for 64-track mode