

## Fibre Channel CJTPAT modified for SAS

The table below lists in detail the modified CJTPAT described in a previous paper, taking into account scrambling and CRC. The modified CJTPAT is a concatenation of two runs of the CJTPAT within a SSP protocol frame. The first run is the original CJTPAT which provides the desired phase jumps with negative (-) starting Running Disparity (RD). The second run of the CJTPAT was modified (RD inverted) to provide the desired phase jumps with positive (+) starting RD.

The table shows that the modified CJTPAT contains the high-density to low-density transitions per the original CJTPAT in both starting RDs and the pattern is consistent with regard to the RD (ending RD = starting RD) so that it can be continuously repeated.

The table lists the pattern in Dword format. A description of the columns of the table follows.

Column 1: The 8B pattern which, after 8B/10B encoding, results in the desired bit pattern on the SAS interface ("desired 8B pattern").

Column 2: The 8B pattern after scrambling. This is the pattern that has to be supplied to the TX scrambler so that the output of the TX scrambler provides the desired 8B pattern to the TX 8B/10B encoder. The last entry in this column is the CRC calculated over the scrambled 8B pattern.

Column 3: The output of the TX scrambler resulting from scrambling the scrambled 8B pattern. As can be seen, the resulting 8B pattern that will be supplied to the TX 8B/10B encoder is indeed the desired 8B pattern. Note that the CRC calculated on the scrambled 8B data gets scrambled as well.

Column 4: The 10B pattern resulting from 8B/10B encoding the output of the TX scrambler (column 3) with positive (+) starting RD, with SOF and EOF primitives. The desired "phase jumps" of the CJTPAT are highlighted. The ending RD is the same as the starting RD.

Column 5: The 10B pattern resulting from 8B/10B encoding the output of the TX scrambler (column 3) with negative (-) starting RD, with SOF and EOF primitives. The desired "phase jumps" of the CJTPAT are highlighted. The ending RD is the same as the starting RD.

The column titled "RD" shows the Running Disparity (RD) at the end of each Dword transmission.

	1	2	3	4				5					
	8B desired "on-the-line"	Scrambled 8B + CRC	Scrambled (Scrambled 8B+CRC)	10B modified CJTPAT with + starting RD				RD	10B modified CJTPAT with - starting RD				RD
SOF				1100000101	1100110100	1101010001	1110001100	-	0011111010	0011001011	0010101110	0001110011	+
	7e7e7e7e	bcac08f3	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	6158cd16	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	db763d12	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	4a2cad2a	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	f42beb7c	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	c564c065	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	8428c943	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	2d887565	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	8efee23f	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	0a01bd34	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	c0f82cef	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	0411d9c8	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	4f1d98a8	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	8e488072	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	608d9457	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	954a58ea	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+
	7e7e7e7e	2dfb4569	7e7e7e7e	01111100011	1000011100	01111100011	1000011100	-	1000011100	01111100011	1000011100	01111100011	+



	7e7e7e7e	2e12c62b	7e7e7e7e	0111100011	1000011100	0111100011	1000011100	-	1000011100	0111100011	1000011100	0111100011	+
	7e7e7e7e	258e4ee6	7e7e7e7e	0111100011	1000011100	0111100011	1000011100	-	1000011100	0111100011	1000011100	0111100011	+
	7e7e7e7e	38aac8cd	7e7e7e7e	0111100011	1000011100	0111100011	1000011100	-	1000011100	0111100011	1000011100	0111100011	+
	7e7e7e7e	7b65e06f	7e7e7e7e	0111100011	1000011100	0111100011	1000011100	-	1000011100	0111100011	1000011100	0111100011	+
	7e7e7e7e	7f22bb28	7e7e7e7e	0111100011	1000011100	0111100011	1000011100	-	1000011100	0111100011	1000011100	0111100011	+
	7e7e7e6b	9c6e4b84	7e7e7e6b	0111100011	1000011100	<b>0111100011</b>	<b>1101000011</b>	+	1000011100	0111100011	1000011100	1101001100	-
	7e544a4a	2834073f	7e544a4a	<b>1000011100</b>	<b>0010110101</b>	0101010101	0101010101	-	0111100011	0010110101	0101010101	0101010101	+
	4a4a4a4a	643c2d16	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	4d5e3cba	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	e5bacda1	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	5128914b	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	692c5526	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	b23dfa6d	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	bfa9c3e8	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	a48d7c5b	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	064eb1d9	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	a29d4578	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	f5ba761e	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4a4a4a4a	a90a764b	4a4a4a4a	0101010101	0101010101	0101010101	0101010101	-	0101010101	0101010101	0101010101	0101010101	+
	4abeb57e	6a447f00	4abeb57e	<b>0101010101</b>	<b>0111101010</b>	<b>1010101010</b>	<b>1000011100</b>	-	0101010101	1000011100	1010101010	0111100011	+
CRC		24113ab8	bd537f34	1011101010	1100100101	0101001100	0010111001	-	0100011010	1100100101	1010110011	0010111001	+
EOF				0011111010	0011001011	1001001110	0010011101	+	1100000101	1100110100	0110110001	1101100010	-