

Appendix B

SPES Counter Conversion Table

8-bit		18-bit Compressed		Uncompressed	
dec	hex	cnt	Value msb	dec	Value hex
0	(0)	0	0	0	(0)
1	(1)	0	1	1	(1)
2	(2)	0	2	2	(2)
3	(3)	0	3	3	(3)
4	(4)	0	4	4	(4)
5	(5)	0	5	5	(5)
6	(6)	0	6	6	(6)
7	(7)	0	7	7	(7)
8	(8)	0	8	8	(8)
9	(9)	0	9	9	(9)
10	(a)	0	10	10	(a)
11	(b)	0	11	11	(b)
12	(c)	0	12	12	(c)
13	(d)	0	13	13	(d)
14	(e)	0	14	14	(e)
15	(f)	0	15	15	(f)
16	(10)	1	0	16	(10)
17	(11)	1	1	17	(11)
18	(12)	1	2	18	(12)
19	(13)	1	3	19	(13)
20	(14)	1	4	20	(14)
21	(15)	1	5	21	(15)
22	(16)	1	6	22	(16)
23	(17)	1	7	23	(17)
24	(18)	1	8	24	(18)
25	(19)	1	9	25	(19)
26	(1a)	1	10	26	(1a)
27	(1b)	1	11	27	(1b)
28	(1c)	1	12	28	(1c)
29	(1d)	1	13	29	(1d)
30	(1e)	1	14	30	(1e)
31	(1f)	1	15	31	(1f)
32	(20)	2	0	32-33	(20-21)
33	(21)	2	1	34-35	(22-23)
34	(22)	2	2	36-37	(24-25)
35	(23)	2	3	38-39	(26-27)
36	(24)	2	4	40-41	(28-29)
37	(25)	2	5	42-43	(2a-2b)
38	(26)	2	6	44-45	(2c-2d)
39	(27)	2	7	46-47	(2e-2f)
40	(28)	2	8	48-49	(30-31)

8-bit			18-bit Compressed	Uncompressed		
dec	hex	cnt	Value msb	dec	Value hex	
41	(29)	2	9	50-51	(32-33)	
42	(2a)	2	10	52-53	(34-35)	
43	(2b)	2	11	54-55	(36-37)	
44	(2c)	2	12	56-57	(38-39)	
45	(2d)	2	13	58-59	(3a-3b)	
46	(2e)	2	14	60-61	(3c-3d)	
47	(2f)	2	15	62-63	(3e-3f)	
48	(30)	3	0	64-67	(40-43)	
49	(31)	3	1	68-71	(44-47)	
50	(32)	3	2	72-75	(48-4b)	
51	(33)	3	3	76-79	(4c-4f)	
52	(34)	3	4	80-83	(50-53)	
53	(35)	3	5	84-87	(54-57)	
54	(36)	3	6	88-91	(58-5b)	
55	(37)	3	7	92-95	(5c-5f)	
56	(38)	3	8	96-99	(60-63)	
57	(39)	3	9	100-103	(64-67)	
58	(3a)	3	10	104-107	(68-6b)	
59	(3b)	3	11	108-111	(6c-6f)	
60	(3c)	3	12	112-115	(70-73)	
61	(3d)	3	13	116-119	(74-77)	
62	(3e)	3	14	120-123	(78-7b)	
63	(3f)	3	15	124-127	(7c-7f)	
64	(40)	4	0	128-135	(80-87)	
65	(41)	4	1	136-143	(88-8f)	
66	(42)	4	2	144-151	(90-97)	
67	(43)	4	3	152-159	(98-9f)	
68	(44)	4	4	160-167	(a0-a7)	
69	(45)	4	5	168-175	(a8-af)	
70	(46)	4	6	176-183	(b0-b7)	
71	(47)	4	7	184-191	(b8-bf)	
72	(48)	4	8	192-199	(c0-c7)	
73	(49)	4	9	200-207	(c8-cf)	
74	(4a)	4	10	208-215	(d0-d7)	
75	(4b)	4	11	216-223	(d8-df)	
76	(4c)	4	12	224-231	(e0-e7)	
77	(4d)	4	13	232-239	(e8-ef)	
78	(4e)	4	14	240-247	(f0-f7)	
79	(4f)	4	15	248-255	(f8-ff)	
80	(50)	5	0	256-271	(100-10f)	
81	(51)	5	1	272-287	(110-11f)	
82	(52)	5	2	288-303	(120-12f)	
83	(53)	5	3	304-319	(130-13f)	
84	(54)	5	4	320-335	(140-14f)	
85	(55)	5	5	336-351	(150-15f)	
86	(56)	5	6	352-367	(160-16f)	

8-bit		18-bit Compressed		Uncompressed	
dec	hex	cnt	Value msb	dec	Value hex
87	(57)	5	7	368-383	(170-17f)
88	(58)	5	8	384-399	(180-18f)
89	(59)	5	9	400-415	(190-19f)
90	(5a)	5	10	416-431	(1a0-1af)
91	(5b)	5	11	432-447	(1b0-1bf)
92	(5c)	5	12	448-463	(1c0-1cf)
93	(5d)	5	13	464-479	(1d0-1df)
94	(5e)	5	14	480-495	(1e0-1ef)
95	(5f)	5	15	496-511	(1f0-1ff)
96	(60)	6	0	512-543	(200-21f)
97	(61)	6	1	544-575	(220-23f)
98	(62)	6	2	576-607	(240-25f)
99	(63)	6	3	608-639	(260-27f)
100	(64)	6	4	640-671	(280-29f)
101	(65)	6	5	672-703	(2a0-2bf)
102	(66)	6	6	704-735	(2c0-2df)
103	(67)	6	7	736-767	(2e0-2ff)
104	(68)	6	8	768-799	(300-31f)
105	(69)	6	9	800-831	(320-33f)
106	(6a)	6	10	832-863	(340-35f)
107	(6b)	6	11	864-895	(360-37f)
108	(6c)	6	12	896-927	(380-39f)
109	(6d)	6	13	928-959	(3a0-3bf)
110	(6e)	6	14	960-991	(3c0-3df)
111	(6f)	6	15	992-1023	(3e0-3ff)
112	(70)	7	0	1024-1087	(400-43f)
113	(71)	7	1	1088-1151	(440-47f)
114	(72)	7	2	1152-1215	(480-4bf)
115	(73)	7	3	1216-1279	(4c0-4ff)
116	(74)	7	4	1280-1343	(500-53f)
117	(75)	7	5	1344-1407	(540-57f)
118	(76)	7	6	1408-1471	(580-5bf)
119	(77)	7	7	1472-1535	(5c0-5ff)
120	(78)	7	8	1536-1599	(600-63f)
121	(79)	7	9	1600-1663	(640-67f)
122	(7a)	7	10	1664-1727	(680-6bf)
123	(7b)	7	11	1728-1791	(6c0-6ff)
124	(7c)	7	12	1792-1855	(700-73f)
125	(7d)	7	13	1856-1919	(740-77f)
126	(7e)	7	14	1920-1983	(780-7bf)
127	(7f)	7	15	1984-2047	(7c0-7ff)
128	(80)	8	0	2048-2175	(800-87f)
129	(81)	8	1	2176-2303	(880-8ff)
130	(82)	8	2	2304-2431	(900-97f)
131	(83)	8	3	2432-2559	(980-9ff)
132	(84)	8	4	2560-2687	(a00-a7f)

$$\begin{matrix} \swarrow \\ \varepsilon \\ \searrow \\ D \end{matrix}$$

$$(D+1) \cdot 2^{S-1} \leq N \leq (D+1) 2^{S-1} + 2^{S-1} - 1$$

8-bit		18-bit Compressed		Uncompressed	
dec	hex	cnt	Value msb	dec	Value hex
133	(85)	8	5	2688-2815	(a80-aff)
134	(86)	8	6	2816-2943	(b00-b7f)
135	(87)	8	7	2944-3071	(b80-bff)
136	(88)	8	8	3072-3199	(c00-c7f)
137	(89)	8	9	3200-3327	(c80-cff)
138	(8a)	8	10	3328-3455	(d00-d7f)
139	(8b)	8	11	3456-3583	(d80-dff)
140	(8c)	8	12	3584-3711	(e00-e7f)
141	(8d)	8	13	3712-3839	(e80-ef)
142	(8e)	8	14	3840-3967	(f00-f7f)
143	(8f)	8	15	3968-4095	(f80-fff)
144	(90)	9	0	4096-4351	(1000-10ff)
145	(91)	9	1	4352-4607	(1100-11ff)
146	(92)	9	2	4608-4863	(1200-12ff)
147	(93)	9	3	4864-5119	(1300-13ff)
148	(94)	9	4	5120-5375	(1400-14ff)
149	(95)	9	5	5376-5631	(1500-15ff)
150	(96)	9	6	5632-5887	(1600-16ff)
151	(97)	9	7	5888-6143	(1700-17ff)
152	(98)	9	8	6144-6399	(1800-18ff)
153	(99)	9	9	6400-6655	(1900-19ff)
154	(9a)	9	10	6656-6911	(1a00-1aff)
155	(9b)	9	11	6912-7167	(1b00-1bff)
156	(9c)	9	12	7168-7423	(1c00-1cff)
157	(9d)	9	13	7424-7679	(1d00-1dff)
158	(9e)	9	14	7680-7935	(1e00-1eff)
159	(9f)	9	15	7936-8191	(1f00-1fff)
160	(a0)	10	0	8192-8703	(2000-21ff)
161	(a1)	10	1	8704-9215	(2200-23ff)
162	(a2)	10	2	9216-9727	(2400-25ff)
163	(a3)	10	3	9728-10239	(2600-27ff)
164	(a4)	10	4	10240-10751	(2800-29ff)
165	(a5)	10	5	10752-11263	(2a00-2bff)
166	(a6)	10	6	11264-11775	(2c00-2dff)
167	(a7)	10	7	11776-12287	(2e00-2fff)
168	(a8)	10	8	12288-12799	(3000-31ff)
169	(a9)	10	9	12800-13311	(3200-33ff)
170	(aa)	10	10	13312-13823	(3400-35ff)
171	(ab)	10	11	13824-14335	(3600-37ff)
172	(ac)	10	12	14336-14847	(3800-39ff)
173	(ad)	10	13	14848-15359	(3a00-3bff)
174	(ae)	10	14	15360-15871	(3c00-3dff)
175	(af)	10	15	15872-16383	(3e00-3fff)
176	(b0)	11	0	16384-17407	(4000-43ff)
177	(b1)	11	1	17408-18431	(4400-47ff)

8-bit		18-bit Compressed		Uncompressed	
dec	hex	cnt	Value msb	dec	Value hex
178	(b2)	11	2	18432-19455	(4800-4bff)
179	(b3)	11	3	19456-20479	(4c00-4fff)
180	(b4)	11	4	20480-21503	(5000-53ff)
181	(b5)	11	5	21504-22527	(5400-57ff)
182	(b6)	11	6	22528-23551	(5800-5bff)
183	(b7)	11	7	23552-24575	(5c00-5fff)
184	(b8)	11	8	24576-25599	(6000-63ff)
185	(b9)	11	9	25600-26623	(6400-67ff)
186	(ba)	11	10	26624-27647	(6800-6bff)
187	(bb)	11	11	27648-28671	(6c00-6fff)
188	(bc)	11	12	28672-29695	(7000-73ff)
189	(bd)	11	13	29696-30719	(7400-77ff)
190	(be)	11	14	30720-31743	(7800-7bff)
191	(bf)	11	15	31744-32767	(7c00-7fff)
192	(c0)	12	0	32768-34815	(8000-87ff)
193	(c1)	12	1	34816-36863	(8800-8fff)
194	(c2)	12	2	36864-38911	(9000-97ff)
195	(c3)	12	3	38912-40959	(9800-9fff)
196	(c4)	12	4	40960-43007	(a000-a7ff)
197	(c5)	12	5	43008-45055	(a800-afff)
198	(c6)	12	6	45056-47103	(b000-b7ff)
199	(c7)	12	7	47104-49151	(b800-bfff)
200	(c8)	12	8	49152-51199	(c000-c7ff)
201	(c9)	12	9	51200-53247	(c800-cfff)
202	(ca)	12	10	53248-55295	(d000-d7ff)
203	(cb)	12	11	55296-57343	(d800-dfff)
204	(cc)	12	12	57344-59391	(e000-e7ff)
205	(cd)	12	13	59392-61439	(e800-efff)
206	(ce)	12	14	61440-63487	(f000-f7ff)
207	(cf)	12	15	63488-65535	(f800-ffff)
208	(d0)	13	0	65536-69631	(10000-10fff)
209	(d1)	13	1	69632-73727	(11000-11fff)
210	(d2)	13	2	73728-77823	(12000-12fff)
211	(d3)	13	3	77824-81919	(13000-13fff)
212	(d4)	13	4	81920-86015	(14000-14fff)
213	(d5)	13	5	86016-90111	(15000-15fff)
214	(d6)	13	6	90112-94207	(16000-16fff)
215	(d7)	13	7	94208-98303	(17000-17fff)
216	(d8)	13	8	98304-102399	(18000-18fff)
217	(d9)	13	9	102400-106495	(19000-19fff)
218	(da)	13	10	106496-110591	(1a000-1afff)
219	(db)	13	11	110592-114687	(1b000-1bfff)
220	(dc)	13	12	114688-118783	(1c000-1cfff)
221	(dd)	13	13	118784-122879	(1d000-1dfff)
222	(de)	13	14	122880-126975	(1e000-1efff)
223	(df)	13	15	126976-131071	(1f000-1ffff)

8-bit		18-bit Compressed		Uncompressed	
dec	hex	cnt	Value msb	dec	Value hex
224	(e0)	14	0	131072–139263	(20000–21fff)
225	(e1)	14	1	139264–147455	(22000–23fff)
226	(e2)	14	2	147456–155647	(24000–25fff)
227	(e3)	14	3	155648–163839	(26000–27fff)
228	(e4)	14	4	163840–172031	(28000–29fff)
229	(e5)	14	5	172032–180223	(2a000–2bfff)
230	(e6)	14	6	180224–188415	(2c000–2dfff)
231	(e7)	14	7	188416–196607	(2e000–2ffff)
232	(e8)	14	8	196608–204799	(30000–31fff)
233	(e9)	14	9	204800–212991	(32000–33fff)
234	(ea)	14	10	212992–221183	(34000–35fff)
235	(eb)	14	11	221184–229375	(36000–37fff)
236	(ec)	14	12	229376–237567	(38000–39fff)
237	(ed)	14	13	237568–245759	(3a000–3bfff)
238	(ee)	14	14	245760–253951	(3c000–3dfff)
239	(ef)	14	15	253952–262143	(3e000–3ffff)