

MAPPING FUNCTION

```

  . _ . _ . _ . _ . 2^L is the number of lines in the map = MAP[4,3,2]
  :   MAP             :
  : _ . _ . _ . _ . : 2^W is the number of sprites/line in the map = MAP[1,0]

```

$$\text{MAP} = 4 * (9 - L) + 5 - W$$

```

D C B A 9 8 7 6 5 4 3 2 1 0    ... Input address bits
| | | | | | | | | | | | |
| |L| >= 9 8 7 6 5 4 3 2 2 |
L+W < D| | | | | | | | | | | |
X-|-|-|-X-X-|-|-|-|-|-|-|-D    ... Output address bits
|C| | | | \ \ \ \ | | | | | |
| X-|-|-X-X-X-|-|-|-|-|-|-|-C
| |B| | | \ \ \ \ \ | | | | |
| | X-|-X-X-X-X-X-|-|-|-|-|-BL = {2,3,4,5,6,7,8,9}
| | |A| | \ \ \ \ \ \ | | | |
| | | X-|-X-X-X-X-X-|-|-|-|-AW = {2,3,4,5}
| | | |9| | \ \ \ \ \ \ | | | |
| | | | X-|-X-X-X-X-X-|-|-|-9L+W =< 13 ; MAPPING ON
| | | | |8| | \ \ \ \ \ \ | | | |
| | | | | X-|-X-X-X-X-X-|-|-8MAP = 0,0 ; MAPPING OFF
| | | | | |7| | \ \ \ \ \ \ | | | |
| | | | | | X-|-X-X-X-X-X-|-7
| | | | | | |6| | \ \ \ \ \ \ | | | |
| | | | | | | X-|-X-X-X-X-X-6
| | | | | | | |5| | \ \ \ \ \ \ \_ 5 = W
W >= 5 - X-X-X-X-X-X-X-X-|-X-|-X-X-X-|-5
| \ \ \ \ \ \ \ \ \ \ \ \ \ |4| | \ \ \ \ \_ 4
4 - X-X-X-X-X-X-X-X-|-X-|-X-X-|-4
| \ \ \ \ \ \ \ \ \ \ \ \ \ | \ \ | \ \ \ \_ 3
3 --- X-X-X-X-X-X-X-X-|-X-|-X-|-3 < -----+
| \ \ \ \ \ \ \ \ \ \ \ \ \ | \ \ | \ \_ 2
2 ----- X-X-X-X-X-X-X-X-|-X-|-|-2 |

```


MAP[m,n]			L =										W =					L >=					W >=				
4,2	1,0	L	W	2	3	4	5	6	7	8	9	2	3	4	5	2	3	4	5	6	7	8	9	2	3	4	5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	9	4	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1
0	2	9	3	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
0	3	9	2	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
1	0	8	5	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	0	1	1	1
1	1	8	4	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1
1	2	8	3	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	1	1	1	1	1	0	1	1	0
1	3	8	2	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1	1	1	1	1	1	0	1	0	0
2	0	7	5	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	1	1	1
2	1	7	4	0	0	0	0	0	1	0	0	0	0	1	0	1	1	1	1	1	1	1	0	0	1	1	1
2	2	7	3	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	1	1	1	1	0	0	1	1	0
2	3	7	2	0	0	0	0	0	1	0	0	1	0	0	0	1	1	1	1	1	1	1	0	0	1	0	0
3	0	6	5	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1
3	1	6	4	0	0	0	0	1	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	1	1	1
3	2	6	3	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	1	1	1	0	0	0	1	1	0
3	3	6	2	0	0	0	0	1	0	0	0	1	0	0	0	1	1	1	1	1	1	0	0	0	1	0	0
4	0	5	5	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1
4	1	5	4	0	0	0	1	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	1	1	1
4	2	5	3	0	0	0	1	0	0	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0	1	1	0
4	3	5	2	0	0	0	1	0	0	0	0	1	0	0	0	1	1	1	1	0	0	0	0	0	1	0	0
5	0	4	5	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1	1
5	1	4	4	0	0	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	1	1	1
5	2	4	3	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	1	1	0
5	3	4	2	0	0	1	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0
6	0	3	5	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	1
6	1	3	4	0	1	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	1	1	1
6	2	3	3	0	1	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	1	1	0
6	3	3	2	0	1	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0
7	0	2	5	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1
7	1	2	4	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	1	1	1
7	2	2	3	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	1	1	0
7	3	2	2	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0

MAP[m,n]					L+W <												
4,2	1,0	L	W	L+W	4	5	6	7	8	9	A	B	C	D			
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
0	1	9	4	D	0	0	0	0	0	0	0	0	0	0	0	0	0
0	2	9	3	C	0	0	0	0	0	0	0	0	0	0	1		
0	3	9	2	B	0	0	0	0	0	0	0	0	0	1	1		
1	0	8	5	D	0	0	0	0	0	0	0	0	0	0	0		
1	1	8	4	C	0	0	0	0	0	0	0	0	0	0	1		
1	2	8	3	B	0	0	0	0	0	0	0	0	0	1	1		
1	3	8	2	A	0	0	0	0	0	0	0	1	1	1			
2	0	7	5	C	0	0	0	0	0	0	0	0	0	1			
2	1	7	4	B	0	0	0	0	0	0	0	0	1	1			
2	2	7	3	A	0	0	0	0	0	0	0	1	1	1			
2	3	7	2	9	0	0	0	0	0	0	1	1	1	1			
3	0	6	5	B	0	0	0	0	0	0	0	0	1	1			
3	1	6	4	A	0	0	0	0	0	0	0	1	1	1			
3	2	6	3	9	0	0	0	0	0	0	1	1	1	1			
3	3	6	2	8	0	0	0	0	0	1	1	1	1	1			
4	0	5	5	A	0	0	0	0	0	0	0	1	1	1			
4	1	5	4	9	0	0	0	0	0	0	1	1	1	1			
4	2	5	3	8	0	0	0	0	0	1	1	1	1	1			
4	3	5	2	7	0	0	0	0	1	1	1	1	1	1			
5	0	4	5	9	0	0	0	0	0	0	1	1	1	1			
5	1	4	4	8	0	0	0	0	0	1	1	1	1	1			
5	2	4	3	7	0	0	0	0	1	1	1	1	1	1			
5	3	4	2	6	0	0	0	1	1	1	1	1	1	1			
6	0	3	5	8	0	0	0	0	0	1	1	1	1	1			
6	1	3	4	7	0	0	0	0	1	1	1	1	1	1			
6	2	3	3	6	0	0	0	1	1	1	1	1	1	1			
6	3	3	2	5	0	0	1	1	1	1	1	1	1	1			
7	0	2	5	7	0	0	0	0	1	1	1	1	1	1			
7	1	2	4	6	0	0	0	1	1	1	1	1	1	1			
7	2	2	3	5	0	0	1	1	1	1	1	1	1	1			
7	3	2	2	4	0	1	1	1	1	1	1	1	1	1			

MAP			MAP			LEn										
4	3	2	1	0	OFF	2	3	4	5	6	7	8	9			
-	-	-	-	-	----	-	-	-	-	-	-	-	-	/OFF = MAP[4]+MAP[3]+MAP[2]+ MAP[1]+MAP[0]		
0	0	0	0	0	1	0	0	0	0	0	0	0	0			
0	0	0	X	1	0	0	0	0	0	0	0	0	0	1		
0	0	0	1	X	0	0	0	0	0	0	0	0	0	1 /LE9 = MAP[4]+MAP[3]+MAP[2]+OFF		
0	0	1	X	X	0	0	0	0	0	0	0	1	0	/LE8 = MAP[4]+MAP[3]+/MAP[2]		
0	1	0	X	X	0	0	0	0	0	0	1	0	0	/LE7 = MAP[4]+/MAP[3]+MAP[2]		
0	1	1	X	X	0	0	0	0	0	1	0	0	0	/LE6 = MAP[4]+/MAP[3]+/MAP[2]		
1	0	0	X	X	0	0	0	0	1	0	0	0	0	/LE5 = /MAP[4]+MAP[3]+MAP[2]		
1	0	1	X	X	0	0	0	1	0	0	0	0	0	/LE4 = /MAP[4]+MAP[3]+/MAP[2]		
1	1	0	X	X	0	0	1	0	0	0	0	0	0	/LE3 = /MAP[4]+/MAP[3]+MAP[2]		
1	1	1	X	X	0	1	0	0	0	0	0	0	0	/LE2 = /MAP[4]+/MAP[3]+/MAP[2]		

MAP				LGEEn										
4	3	2	OFF	2	3	4	5	6	7	8	9			
-	-	-	----	-	-	-	-	-	-	-	-			
0	0	0	1	0	0	0	0	0	0	0	0			
0	0	0	0	1	1	1	1	1	1	1	1	/LGE9 = /LE9		
0	0	1	0	1	1	1	1	1	1	1	0	/LGE8 = MAP[4]+MAP[3]+OFF		
0	1	0	0	1	1	1	1	1	1	0	0	/LGE7 = MAP[4]+MAP[3]*MAP[2]+OFF		
0	1	1	0	1	1	1	1	1	0	0	0	/LGE6 = MAP[4]+OFF		
1	0	0	0	1	1	1	1	0	0	0	0	/LGE5 = MAP[4]*(MAP[3]+MAP[2])+OFF		
1	0	1	0	1	1	1	0	0	0	0	0	/LGE4 = MAP[4]*MAP[3]+OFF		
1	1	0	0	1	1	0	0	0	0	0	0	/LGE3 = LE2+OFF		
1	1	1	0	1	0	0	0	0	0	0	0	/LGE2 = OFF		

MAP			W =					
1	0	OFF	2	3	4	5		
-	-	----	-	-	-	-		
0	0	1	0	0	0	0		
0	0	0	0	0	0	1	/WE5 = MAP[1]+MAP[0]+OFF	
0	1	0	0	0	1	0	/WE4 = MAP[1]+/MAP[0]	
1	0	0	0	1	0	0	/WE3 = /MAP[1]+MAP[0]	
1	1	0	1	0	0	0	/WE2 = /MAP[1]+/MAP[0]	

MAP		W >=					
1	0	OFF	2	3	4	5	
-	-	---	-	-	-	-	
0	0	1	0	0	0	0	
0	0	0	1	1	1	1	/WGE5 = /WE5
0	1	0	1	1	1	0	/WGE4 = MAP[1]+OFF
1	0	0	1	1	0	0	/WGE3 = WE2+OFF
1	1	0	1	0	0	0	/WGE2 = /OFF

/LPWLD = WE5*LE8+WE4*LE9
 /LPWLC = WE5*LGE7+WE4*LGE8+WE4*LE9
 /LPWLB = WE5*LGE6+WE4*LGE7+WE3*LGE8+WE2*LE9
 /LPWLA = WE5*LGE5+WE4*LGE6+WE3*LGE7+WE2*LGE8
 /LPWL9 = WE5*LGE4+WE4*LGE5+WE3*LGE6+WE2*LGE7
 /LPWL8 = WE5*LGE3+WE4*LGE4+WE3*LGE5+WE2*LGE6
 /LPWL7 = WE5*LGE2+WE4*LGE3+WE3*LGE4+WE2*LGE5
 /LPWL6 = WE4*LGE2+WE3*LGE3+WE2*LGE4
 /LPWL5 = WE3*LGE2+WE2*LGE3
 /LPWL4 = /OFF

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