

Summary of SPECTRA Display Modes

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Mode Options					Mode Number	Colour Resolution (w x h)	Attribute Size (w x h)	Attribute Foreground Colours	Attribute Background Colours	Attribute Cell Bright	Attribute Foreground Bright	Attribute Background Bright	Attribute Cell Flash	Attribute Foreground Flash	Attribute Background Flash	Border Colours	Border Bright	Border Flash	
Full cell	Standard border	Single attribute byte	Basic colours	Row	0	32 x 24	8 x 8	8	8	Yes	-	-	Yes	-	-	8	-	-	
				Dual	1	32 x 48	8 x 4	8	8	Yes	-	-	Yes	-	-	8	-	-	
				Line	2	32 x 96	8 x 2	8	8	Yes	-	-	Yes	-	-	8	-	-	
			Extra colours	Row	3	32 x 192	8 x 1	8	8	Yes	-	-	Yes	-	-	8	-	-	
				Quad	4	32 x 24	8 x 8	64	2	-	-	-	Yes	-	-	8	-	-	
				Dual	5	32 x 48	8 x 4	64	2	-	-	-	Yes	-	-	8	-	-	
				Line	6	32 x 96	8 x 2	64	2	-	-	-	Yes	-	-	8	-	-	
		Double attribute byte	Row	7	32 x 192	8 x 1	64	2	-	-	-	Yes	-	-	8	-	-		
			Quad	8	32 x 24	8 x 8	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-		
			Dual	9	32 x 48	8 x 4	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-		
		Enhanced border	Single attribute byte	Basic colours	Row	10	32 x 96	8 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-
					Dual	11	32 x 96	8 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-
					Line	12	32 x 128 / 32 x 32	8 x 1 / 8 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-
				Extra colours	Row	13	32 x 24	8 x 8	64	64	-	-	-	-	Yes	Yes	8	-	-
	Quad				14	32 x 48	8 x 4	64	64	-	-	-	-	Yes	Yes	8	-	-	
	Dual				15	32 x 96	8 x 2	64	64	-	-	-	-	Yes	Yes	8	-	-	
	Line				16	32 x 128 / 32 x 32	8 x 1 / 8 x 2	64	64	-	-	-	-	Yes	Yes	8	-	-	
	Double attribute byte		Basic colours	Row	17	32 x 24	8 x 8	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
				Quad	18	32 x 48	8 x 4	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
				Dual	19	32 x 96	8 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
				Line	20	32 x 192	8 x 1	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
				Row	21	32 x 24	8 x 8	64	2	-	-	-	Yes	-	-	64	-	-	
			Extra colours	Quad	22	32 x 48	8 x 4	64	2	-	-	-	Yes	-	-	64	-	-	
				Dual	23	32 x 96	8 x 2	64	2	-	-	-	Yes	-	-	64	-	-	
				Line	24	32 x 192	8 x 1	64	2	-	-	-	Yes	-	-	64	-	-	
				Row	25	32 x 24	8 x 8	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
				Quad	26	32 x 48	8 x 4	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
	Double attribute byte	Basic colours	Dual	27	32 x 96	8 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes		
			Line	28	32 x 128 / 32 x 32	8 x 1 / 8 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes		
			Row	29	32 x 24	8 x 8	64	64	-	-	-	-	Yes	Yes	64	-	-		
		Extra colours	Quad	30	32 x 48	8 x 4	64	64	-	-	-	-	Yes	Yes	64	-	-		
Dual			31	32 x 96	8 x 2	64	64	-	-	-	-	Yes	Yes	64	-	-			
Line			32	32 x 128 / 32 x 32	8 x 1 / 8 x 2	64	64	-	-	-	-	Yes	Yes	64	-	-			
Half cell	Standard border	Single attribute byte	Basic colours	Row	128	64 x 24	4 x 8	8	1	Yes	-	-	Yes	-	-	8	-	-	
				Quad	129	64 x 48	4 x 4	8	1	Yes	-	-	Yes	-	-	8	-	-	
				Dual	130	64 x 96	4 x 2	8	1	Yes	-	-	Yes	-	-	8	-	-	
			Extra colours	Line	131	64 x 192	4 x 1	8	1	Yes	-	-	Yes	-	-	8	-	-	
				Row	132	64 x 24	4 x 8	2 / 64	1	-	-	-	Yes	-	-	8	-	-	
				Quad	133	64 x 48	4 x 4	2 / 64	1	-	-	-	Yes	-	-	8	-	-	
				Dual	134	64 x 96	4 x 2	2 / 64	1	-	-	-	Yes	-	-	8	-	-	
		Double attribute byte	Basic colours	Line	135	64 x 192	4 x 1	2 / 64	1	-	-	-	Yes	-	-	8	-	-	
				Row	136	64 x 24	4 x 8	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-	
				Quad	137	64 x 48	4 x 4	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-	
			Extra colours	Dual	138	64 x 96	4 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-	
				Line	139	64 x 128 / 64 x 32	4 x 1 / 4 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	-	-	
				Row	140	64 x 24	4 x 8	64	1*	-	-	-	-	Yes	Yes	8	-	-	
				Quad	141	64 x 48	4 x 4	64	1*	-	-	-	-	Yes	Yes	8	-	-	
	Enhanced border	Single attribute byte	Basic colours	Dual	142	64 x 96	4 x 2	64	1*	-	-	-	-	Yes	Yes	8	-	-	
				Line	143	64 x 128 / 64 x 32	4 x 1 / 4 x 2	64	1*	-	-	-	-	Yes	Yes	8	-	-	
				Row	144	64 x 24	4 x 8	8	1	Yes	-	-	Yes	-	-	8	Yes	Yes	
			Extra colours	Quad	145	64 x 48	4 x 4	8	1	Yes	-	-	Yes	-	-	8	Yes	Yes	
				Dual	146	64 x 96	4 x 2	8	1	Yes	-	-	Yes	-	-	8	Yes	Yes	
				Line	147	64 x 192	4 x 1	8	1	Yes	-	-	Yes	-	-	8	Yes	Yes	
				Row	148	64 x 24	4 x 8	2 / 64	1	-	-	-	Yes	-	-	64	-	-	
		Double attribute byte	Basic colours	Quad	149	64 x 48	4 x 4	2 / 64	1	-	-	-	Yes	-	-	64	-	-	
				Dual	150	64 x 96	4 x 2	2 / 64	1	-	-	-	Yes	-	-	64	-	-	
				Line	151	64 x 192	4 x 1	2 / 64	1	-	-	-	Yes	-	-	64	-	-	
			Extra colours	Row	152	64 x 24	4 x 8	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
				Quad	153	64 x 48	4 x 4	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
				Dual	154	64 x 96	4 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
				Line	155	64 x 128 / 64 x 32	4 x 1 / 4 x 2	8	8	-	Yes	Yes	-	Yes	Yes	8	Yes	Yes	
Double attribute byte	Basic colours	Row	156	64 x 24	4 x 8	64	1*	-	-	-	-	Yes	Yes	64	-	-			
		Quad	157	64 x 48	4 x 4	64	1*	-	-	-	-	Yes	Yes	64	-	-			
		Dual	158	64 x 96	4 x 2	64	1*	-	-	-	-	Yes	Yes	64	-	-			
	Extra colours	Line	159	64 x 128 / 64 x 32	4 x 1 / 4 x 2	64	1*	-	-	-	-	Yes	Yes	64	-	-			

The pixel resolution in each display mode is 256 x 192.

Attribute = Size of the smallest pixel block covered by a single colour value.

Cell = Attribute file byte, which can contain 1 attribute (8 pixels wide) or 2 attributes (each 4 pixels wide).

Where 8 colours are stated, these are the standard range of Spectrum colours.

An attribute or border which supports a Bright option can display 15 unique colours.

* = The SPECTRA specification states that this option should be 2 but the actual SPECTRA interface does not have sufficient resources available to implement it.

2 / 64 = Number of colours for odd numbered attributes / Number of colours for even numbered attributes.

32 x 128 / 32 x 32 = 128 single pixel lines (each attribute 8 x 1 pixels) followed by 32 two pixel lines (each attribute 8 x 2 pixels).

64 x 128 / 64 x 32 = 128 single pixel lines (each attribute 4 x 1 pixels) followed by 32 two pixel lines (each attribute 4 x 2 pixels).

All modes can be double buffered, i.e. all drawing occurs to one display / attribute file while another is being shown. This allows the process of drawing to the screen to be invisible to the user and hence no flicker seen.