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Acorn

Video parameters for RISC OS Computers

(Not MonitorType 5)

Each screen mode within RISC OS has a number of parameters which describe the resolution and other details of the mode. This application note documents these parameters for each mode. The information on MonitorType 4 and MonitorType 5 is only applicable to RISC OS 2.01, RISC OS 3.0 and RISC OS 3.1.

Applicable Hardware :	Any ARM based platform fitted with RISC OS 3.10.	Related Application Notes:	(249) Connection of Monitors to RISC OS Computers

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The data within this application note can be used to ensure the monitor you wish to purchase will best suit your needs. The following are two examples of where the data may be of use. MonitorType 5 is the LCD display used in the A4 Portable, and hence is not relevant to this discussion.

1. If you require a monitor which will work at SVGA resolution and also play games then the monitor you choose must be able to work at the high scan rates for SVGA (35.156KHz) and also at lower 'TV' scan rates for the games modes (15.625KHz).

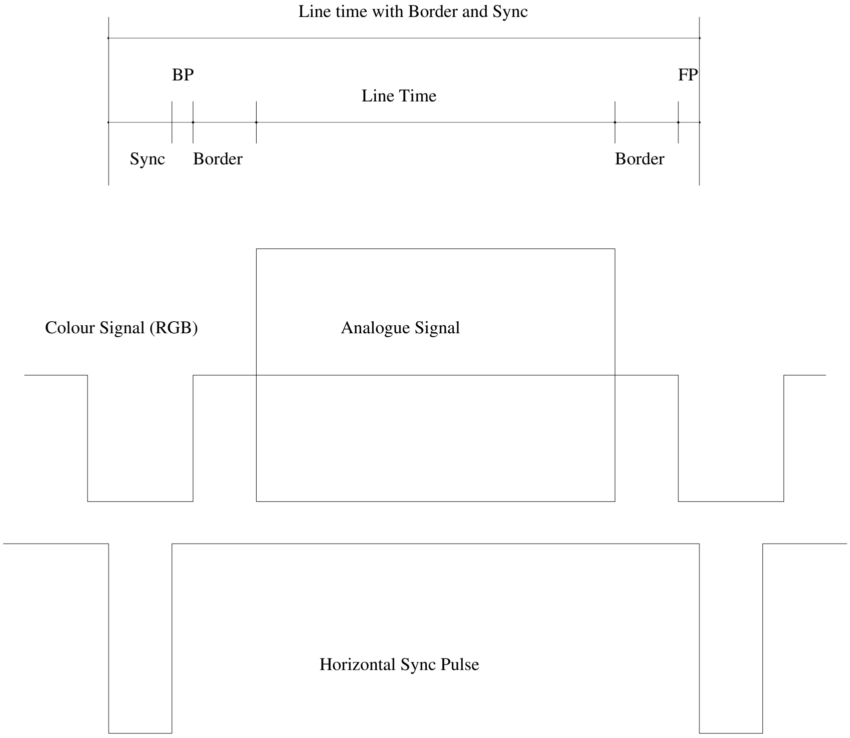
2. Some users may wish to use a large, high resolution display for use under UNIX or possibly desktop publishing. The high resolution monitortype (type 2) has only one mode (MODE 23) and scans horizontally at 61.224KHz

The parameters below are based on the following system:

Horizontal frequency = reciprocal of time taken to scan one line of the raster image
Vertical frequency = reciprocal of time taken to scan one complete frame of raster lines

The remaining parameters are best understood in terms of a diagram of signal level vs. time:

(BP = Back Porch
FP = Front Porch)



Each horizontal raster line comprises a sync pulse (either supplied on the HSync pin or stripped out of the CSync signal. The nature of the Sync signal sent by the computer is dependent on the status of the Sync bit in CMOS RAM; **`*CONFIGURE SYNC 0`** sets the syncs to be separate, **`*CONFIGURE SYNC 1`** sets a composite sync to be output on Pin 14 of the computer's monitor connector. Currently, there is no facility for the sync signal to be mixed with the signal supplied on the Green pin.

Following the Sync pulse, Back Porch delay and the first Border signal, the section marked "Analogue Signal" in the diagram above is the actual levels of Red, Green and Blue which are painted onto the monitor phosphor. The horizontal scan is finished by the second Border delay and Front Porch signal.
Each complete frame is delineated by a Vertical Sync pulse, either supplied on the VSync pin or stripped out of the CSync signal.

Note that Acorn systems supply CSync on Pin 14 (the VSync line) when CSync is selected, and *not* Pin 13 (HSync). For some monitors capable of sensing host configuration, it may be necessary to remove connections to Pin 13 in the cable to prevent confusion in the monitor over which sync type is being presented.

Monitor and Screen Mode Data

Monitor type 0 (TV Standard)

Mode	Hor. Freq.(kHz)	Ver.Freq.(Hz)	Hor.Sync (us)	Ver.Sync (us)	Fr.Porch (us)	Bk.Porch (us)	Line Time (us)	with Border(us)
0	15.625	50.0801	4.75	192	1.6875	5.5625	40	52
1	15.625	50.0801	4.75	192	1.625	5.625	40	52
2	15.625	50.0801	4.75	192	1.625	5.625	40	52
3	15.625	50.0801	4.75	192	1.6875	5.5625	40	52
4	15.625	50.0801	4.75	192	1.6875	5.5625	40	52
5	15.625	50.0801	4.75	192	1.625	5.625	40	52
6	15.625	50.0801	4.75	192	1.625	5.625	40	52
7	15.625	50.0801	4.75	192	1.625	5.625	40	52
8	15.625	50.0801	4.75	192	1.6875	5.5625	40	52
9	15.625	50.0801	4.75	192	1.625	5.625	40	52
10	15.625	50.0801	4.75	192	1.625	5.625	40	52
11	15.625	50.0801	4.75	192	1.6875	5.5625	40	52
12	15.625	50.0801	4.75	192	1.6875	5.5625	40	52
13	15.625	50.0801	4.75	192	1.625	5.625	40	52
14	15.625	50.0801	4.75	192	1.6875	5.5625	40	52
15	15.625	50.0801	4.75	192	1.6875	5.5625	40	52
16	15.625	50.0801	4.75	192	1.70833	5.54166	44	52
17	15.625	50.0801	4.75	192	1.70833	5.54166	44	52
24	15.625	50.0801	4.75	192	1.70833	5.54166	44	52
33	15.625	50.0801	4.75	192	3.6875	7.5625	48	48
34	15.625	50.0801	4.75	192	3.6875	7.5625	48	48
35	15.625	50.0801	4.75	192	3.6875	7.5625	48	48
36	15.625	50.0801	4.75	192	3.6875	7.5625	48	48

Monitor type 1 (Multiscan)

Mode	Hor. Freq.(kHz)	Ver.Freq.(Hz)	Hor.Sync (us)	Ver.Sync (us)	Fr.Porch (us)	Bk.Porch (us)	Line Time (us)	with Border(us)
0	15.625	50.0801	4.5	192	4.5625	3.9375	40	51
1	15.625	50.0801	4.5	192	4.625	3.875	40	51
2	15.625	50.0801	4.5	192	4.625	3.875	40	51
3	15.625	50.0801	4.5	192	4.5625	3.9375	40	51
4	15.625	50.0801	4.5	192	4.5625	3.9375	40	51
5	15.625	50.0801	4.5	192	4.625	3.875	40	51
6	15.625	50.0801	4.5	192	4.625	3.875	40	51
7	15.625	50.0801	4.5	192	4.625	3.875	40	51
8	15.625	50.0801	4.5	192	4.5625	3.9375	40	51
9	15.625	50.0801	4.5	192	4.625	3.875	40	51
10	15.625	50.0801	4.5	192	4.625	3.875	40	51
11	15.625	50.0801	4.5	192	4.5625	3.9375	40	51
12	15.625	50.0801	4.5	192	4.5625	3.9375	40	51
13	15.625	50.0801	4.5	192	4.625	3.875	40	51
14	15.625	50.0801	4.5	192	4.5625	3.9375	40	51
15	15.625	50.0801	4.5	192	4.5625	3.9375	40	51
16	15.625	50.0801	4.5	192	3.625	3.04166	44	52.8333
17	15.625	50.0801	4.5	192	3.625	3.04166	44	52.8333
18	26.7857143	50.1605	2.33333	112	3.54166	4.625	26.6666	26.8333
19	26.7857	50.1605	2.33333	112	3.54166	4.625	26.6666	26.8333
20	26.7857	50.1605	2.33333	112	3.54166	4.625	26.6666	26.8333
21	26.7857	50.1605	2.33333	112	3.54166	4.625	26.6666	26.8333
24	15.625	50.0801	4.5	192	3.625	3.0417	44	52.8333
25	31.46875	59.9405	3.8133	63.5551	0.67527	1.8669	25.422	25.422
26	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.422	25.422
27	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.422	25.422
28	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.422	25.422
31	35.15625	56.25	2	56.8888	0.63888	3.58333	22.2222	22.2222
33	15.625	50.0801	4.75	192	3.6875	7.5625	48	48
34	15.625	50.0801	4.75	192	3.6875	7.5625	48	48
35	15.625	50.0801	4.75	192	3.6875	7.5625	48	48
36	15.625	50.0801	4.75	192	3.6875	7.5625	48	48

MonitorType 2: (High-Resolution Mono)

Mode	Hor. Freq.(kHz)	Ver.Freq.(Hz)	Hor.Sync (us)	Ver.Sync (us)	Fr.Porch (us)	Bk.Porch (us)	Line Time (us)	with Border(us)
23	61.2245	64.4469	2.1666	49	0.04166	1.95833	12	12.1666

MonitorType 3 (VGA)

Mode	Hor. Freq.(kHz)	Ver.Freq.(Hz)	Hor.Sync (us)	Ver.Sync (us)	Fr.Porch (us)	Bk.Porch (us)	Line Time (us)	with Border(us)
0	31.46875	70.0863	3.81331	63.5551	0.27805	1.46971	25.4220457	26.2165
1	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.4220	26.3754
2	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.4220	26.3754
3	31.46875	70.0863	3.81331	63.5551	0.27805	1.46971	25.4220	26.2165
4	31.46875	70.0863	3.81331	63.5551	0.27805	1.46971	25.4220	26.2165
5	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.4220	26.3754
6	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.4220	26.3754
7	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.4220	26.3754
8	31.46875	70.0863	3.81331	63.5551	0.27805	1.46971	25.4220	26.2165
9	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.4220	26.3754
10	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.4220	26.3754
11	31.46875	70.0863	3.81331	63.5551	0.27805	1.46971	25.4220	26.2165
12	31.46875	70.0863	3.81331	63.5551	0.27805	1.46971	25.4220	26.2165
13	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.4220	26.3754
14	31.46875	70.0863	3.81331	63.5551	0.27805	1.46971	25.4220	26.2165
15	31.46875	70.0863	3.81331	63.5551	0.27805	1.46971	25.4220	26.2165
25	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.4220	25.4220
26	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.4220	25.4220
27	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.4220	25.4220
28	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.4220	25.4220

MonitorType 4 (SVGA)

Mode	Hor. Freq.(kHz)	Ver.Freq.(Hz)	Hor.Sync (us)	Ver.Sync (us)	Fr.Porch (us)	Bk.Porch (us)	Line Time (us)	with Border(us)
0	31.46875	70.0863	3.81331	63.5551	0.27805	1.4697	25.42205	26.2165
1	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.42205	26.3754
2	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.42205	26.3754
3	31.46875	70.0863	3.81331	63.5551	0.27805	1.4697	25.42205	26.2165
4	31.46875	70.0863	3.81331	63.5551	0.27805	1.4697	25.42205	26.2165
5	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.42205	26.3754
6	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.42205	26.3754
7	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.42205	26.3754
8	31.46875	70.0863	3.81331	63.5551	0.27805	1.4697	25.42205	26.2165
9	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.42205	26.3754
10	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.42205	26.3754
11	31.46875	70.0863	3.81331	63.5551	0.27805	1.4697	25.42205	26.2165
12	31.46875	70.0863	3.81331	63.5551	0.27805	1.4697	25.42205	26.2165
13	31.46875	70.0863	3.81331	63.5551	0.23833	1.35055	25.42205	26.3754
14	31.46875	70.0863	3.81331	63.5551	0.27805	1.4697	25.42205	26.2165
15	31.46875	70.0863	3.81331	63.5551	0.27805	1.4697	25.42205	26.2165
25	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.42205	25.42205
26	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.42205	25.42205
27	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.42205	25.42205
28	31.46875	59.9405	3.81331	63.5551	0.67527	1.8669	25.42205	25.42205
31	35.15625	56.25	2	56.8888	0.638888	3.58333	22.2222	22.2222