Information for Oak Technologies Inc. Chipset Users

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1 Supported chipsets

The driver is used in the 8-bit / 256-color SVGA server and the mono server. The following chipsets for Oak Tech. Inc. are supported:

OTI067

ISA SVGA chipset, up to 512Kbytes of DRAM (usually 70/80 ns).

OTI077

Enhanced version of the 067, with support for 1Mbyte and up to 65 Mhz dot-clock, this chipset supports up to 1024x768x256 colors in Non-Interlaced mode, and up to 1280x1024x16 colors Interlaced.

OTI087

One of the first VLB chipsets available, it has a 16-bit external data path, and a 32-bit internal memory-controller data path, it also has register-based color expansion, hardware cursor, a primitive BitBlt engine, a 64 bit graphic latch and some other new (in its time) features. Maximun BIOS resolutions are 1024x768x256 Non-Interlaced and 1280x1024x256 interlaced. Maximun Dot-Clock is 80Mhz, but usually is coupled with OTI068 clock generator whose highest frequency is 78Mhz. Supports up to 2MBytes of 70ns DRAM.

All the chipsets are "Backwards compatible", in fact some early drivers for the OTI087 based chipsets were for the 077!!!!

Accelerated support is included only for OTI087 chipsets, also Mono server is only included for 067/077 chipsets.

2 XF86Config options

The following options are of particular interest to the Oak driver. Each of them must be specified in the 'svga' driver section of the `XF86Config` file, within the Screen subsections to which they are applicable (you can enable options for all depths by specifying them in the Device section).

Option "linear" (OTI087)

This option enables a linear framebuffer at 0xE00000 (14Mb) for cards recognized as ISA by the probe. Cards that are VLB will map the framebuffer at 0x4E00000. The aperture depends on the VideoRam parameter in the `XF86Config` file or on the probed value for the board. It will speed up performance by about 15% on a VLB-based boards for a DX2-66 486.

Option "fifo_aggressive" (OTI087)

This option will cause the command FIFO threshold of the chipset to be set at 2 instructions, which should be optimal for 16-bit data transfers, as empirical use of different thresholds with xbench show. Expect a 5-10% of performance boost on a DX2-66 486.

Option "fifo_conservative" (OTI087)

This option will set the FIFO to a safe value of 14, slowing the board by a 50%, use this only if you experience streaks or anomalies on the screen.

Option "favour_bitblt" (OTI087)

This option will enable an internal cache on the board that will be used as a rudimentary bitblt engine. Performance boost is more or less 100%, (double BlitStones on xbench). Most OTI087 boards seem to have this feature broken, corrupting text from xterms and leaving mouse droppings throughout the screen. As a rule of thumb, enable it, if it works badly, disable it ;).

3 Mode issues

The use of very high dot-clocks has a REAL negative effect on the performance of the boards, due to its limited 80Mbit/sec, higher dot clocks limit its ability to draw data into the frambuffer. Thus expect better performance of a 72Mhz based mode than on a 78Mhz based one (for example) where more bandwidth is required for screen refresh.

It does not make much sense to use the highest clock (78 MHz) for 1024x768 at 76 Hz on a OTI087; the card will almost come to a standstill. A 75 MHz dot clock results in 70 Hz which should be acceptable. If you have a monitor that supports 1024x768 at 76 Hz with a 78 MHz dot clock, a standard OTI087 based card is a poor match anyway.

4 Linear addressing

Linear addressing is hardwired to 14 Mbytes for ISA boards and 78 Mbytes for VLB boards, thus if you have more than that on your board you shouldn't enable it. The aperture is selected from the VideoRam parameter of the XF86Config or from the amount of memory that is detected if VideoRam is not found.

I hope (because I have not tested it very thoroughly) that linear addressing will work on ISA boards, VLB ones are fine (I am writing this stuff on mine).

GOOD LUCK!!!!

$XFree86: xc/programs/Xserver/hw/xfree86/doc/sgml/Oak.sgml,v 3.3 1995/01/28 16:02:01 dawes Exp $
$XConsortium: Oak.sgml,v 1.1 95/01/23 15:05:36 kaleb Exp $