Collected information for the Diamond FireGL 4000

1. The Product

This card is a professional graphics card, which has been sold by Diamond, but is actually a slightly modified AccelEclipse II from AccelGraphics.
It appeared on the market in 1997 and was primarily intended for CAD applications under Windows NT.
The main graphics processor is from Evans & Sutherland, which got well known in the flight simulator business, but has been rather unknown in the pc market
Due to the selling price (2995 $ for the 4 MB version resp. 3495 $ for the 16 MB version) the cards were not widely used and therefore also not very often to be found nowadays.

2. Technical Data

- 3D graphics processor: RealIMAGE 1000 from Evans & Sutherland
- 2D graphics processor: CL-GD5446 from Cirrus Logic
- Chipset: Mitsubishi 3DPro/2mp
- Memory: 1 MB EDO DRAM for 2D, 15 MB 3DRAM (frame buffer, Z-buffer) and either 4 or 16 MB CDRAM (Cached DRAM, texture memory)
- RAMDAC: 220 MHz (Texas Instruments TVP3026)
- Horizontal frequency: 31,5 - 96 KHz
- Vertical Frequency: 60 -120 Hz
- maximum resolution: 1280 x 1024 in True Color (16,7 Mio. Colors)
- Interface: PCI v2.1 (33 MHz / 32 Bit)
- external connectors: 1 x VGA, 1 x Stereo
- supports DMA bus mastering

3. Technical

The Cirrus Logic CL-GD5446 is responsible for the 2D part, while the RealIMAGE 1000 takes care of the 3D part.

4. Drivers/Software

Diamond used modified drivers for their card. Unfortunately, the OS support for this card is rather limited: Basically there are only Windows NT drivers. But they exist for Windows NT 3.51 (version 3.51.1057.2138 rel.1098 from 30.10.1998) as well as for Windows NT 4.0. For the latter one there are versions for Intel x86 cpus (version 4.00.1381.2221 rel.1198 from 23.11.1998) as well as for DECs Alpha cpus (version 2.1.0.15 rel.0298 from 13.02.1998). The driver supports OpenGL 1.1.

There are reports, where the windows NT 4.0 x86 driver has successfully been used with Windows 2000/XP, even though the Control Panel was reported to not work. My experiences are that the driver worked in principle, but the hardware mouse cursor did not function, even though it was activated in the control panel.

There also exists a driver for Windows 95, but he only uses the Cirrus Logic, e.g. the 3D part lies completely dormant.

The "big" driver package for Windows NT for x86 was improved by a display list driver ("Big Focus") for AutoCAD 13 NT and a viewer software ("3D-Win") for AutoCAD files (but which required an installed Autocad r13).

Alternatively the driver for the AccelECLIPSE II might probably be used. It is slightly newer (version 2.4B151 from 12.05.1999).

5. Additional Detail informationen

5.1 3DRAM

The cards has 15 MB 3DRAM soldered on.
In conjunction with the used 3DPro/2mp chipset this type of RAM from Mitsubishi allowed to transfer four key operation (anti-aliasing, blending, Z-buffer compares and raster operations) into the 3DRAM and therefore to lighten the burden on the cpu.

5.2 CDRAM

The card has a memory slot, in which a CDRAM stick (cached DRAM, at 16 MB capacity probably 64 KB SRAM cache) is plugged in.
The cache allows for improved access on the texture memory.

The Diamond FireGL 4000 was available with 4 MB (Fire GL 415190 15X4 3DRAM/CDRAM PCI) and 16 MB (Fire GL 415310 15X16 3DRAM/CDRAM PCI). Unfortunately the CDRAM memory stick strongly resembles a normal SD-RAM stick, so that in quite a few cases the stick has been removed, without considering that the card will not work or only with strongly reduced efficiency.

5.3 Dual Card Setup

Under Windows NT it is even possible to use two of these cards at the same time! But for this to work, the VGA component has to be disabled on one of the cards (via jumper). Additionally both cards have to be used in the same resolution and the same frequency.

5.4 Cirrus Logic CL-GD5446

This chip offer a solid base for the 2D part, but it has only 1 MB EDO DRAM available, although it theoretically could address 4 MB.
Interestingly the 2D part can be disabled (after the initial driver installation). So it should be possible to use a different 2D card.
Whether in this case the 1 MB memory of the 2D part is set available for the 3D part remains to be tested. My assumption would be rather no, as this is an entirely different type of memory.