

AMD Geode™ Solutions

Editing the Durango Mode Table for Display Drivers



1.0 Scope

Durango is a graphics/video software support package designed to assist in the development of display drivers and embedded applications. The core of this package is source code that performs most of the graphics related functionality for AMD Geode™ solutions. Development time for new software is reduced by using these routines to access the hardware.

This document describes how to add a new video mode to display drivers that incorporate Durango. The examples referenced are from the Windows® CE driver set. The modifications for other platforms would be similar and the steps provided should still be applicable.

2.0 Discussion

The steps to add a new video mode to display drivers that incorporate Durango are:

- 1) The first step is to add the new mode into the Durango mode table. The Durango modes are at the beginning of the file `gfx_disp.c` in the 'DisplayParams' array. The mode can be added at any point to the Durango table. No ordering is assumed. An example mode addition might be:

```
{ GFX_MODE_70HZ |
  GFX_MODE_8BPP | GFX_MODE_12BPP |
  GFX_MODE_15BPP | GFX_MODE_16BPP |
  GFX_MODE_24BPP | GFX_MODE_NEG_HSYNC |
  GFX_MODE_NEG_VSYNC,
  0x0280, 0x0280, 0x0298, 0x02D8,
  0x0330, 0x0330, 0x01E0, 0x01E0,
  0x01E2, 0x01E5, 0x01F4, 0x01F4,
  0x001C8F5C,
},
```

In this structure, the `GFX_MODE_70HZ` indicates that the mode is a 70 Hz refresh. The available refresh rates are 56, 60, 70, 72, 75, 85, 90, and 100 Hz. The `GFX_MODE_8BPP`, `GFX_MODE_12BPP`, etc. flags indicate the supported color depths for the new mode; 8, 12, 15, 16, and 24 can all be supported. The `GFX_MODE_NEG_HSYNC` and `GFX_MODE_NEG_VSYNC` flags indicate that the horizontal and vertical synchronous output polarities for this mode are inverted.

The next 12 structure members represent the mode timings. In order, they are: `HACTIVE`, `HBLANKSTART`, `HSYNCSTART`, `HSYNCEND`, `HBLANKEND`, `HTOTAL`, `VACTIVE`, `VBLANKSTART`, `VSYNCSTART`, `VSYNCEND`, `VBLANKEND`, AND `VTOTAL`. These values are generally derived from a timing sheet.

The last structure member represents the Dot Clock frequency in 16.16 fixed point format. In the example, the frequency is specified as 28.56 MHz.

- 2) Add the new Dot Clock frequency to the Dot Clock table. If the pixel clock for the new mode is not in Durango's PLL tables, it must be added. The Geode processor's PLL values are in the `vid_rdcl.c` file in the `RCDF_PLLtable` array. Each array member includes the frequency, the M,N and P divisor values and the pre and post divisor settings.
- 3) In the XP driver, the mode must also be added to the driver's mode tables. The mode tables are in the `miniport\gxmode.h` file in the `gxVideoModes` array. The mode structure description is available in the Windows DDK (Driver Development Kit). Note that the XP driver requires a separate mode entry for each supported color depth. This step is not required in Windows CE.
- 4) To add a new TFT resolution, a similar procedure is followed, except that the new mode must be added to the `FixedParams` array in `gfx_disp.c`. A little more work must also be done in the XP driver to allow the custom panel resolution.

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www.amd.com

One AMD Place
P.O. Box 3453,
Sunnyvale, CA 94088-3453 USA
Tel: 408-732-2400 or 800-538-8450
TWX: 910-339-9280
TELEX: 34-6306

TECHNICAL SUPPORT

USA & Canada: 800-222-9323 or 408-749-5703
USA & Canada: PC Microprocessor: 408-749-3060

Latin America Email: spanish.support@amd.com
Argentina: 001-800-200-1111, after tone 800-859-4478
Chile: 800-532-853
Mexico: 95-800-222-9323

Europe & UK: +44-0-1276-803299
Fax: +44-0-1276-803298
France: 0800-908-621
Germany: +49-89-450-53199
Italy: 800-877224
Europe Email: euro.tech@amd.com

Far East Fax: 852-2956-0588
Japan Fax: 81-3-3346-7848

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