NINTENDO
NITRO-System

G2D Sample Program User's Guide

Version 0.9.6

> **The contents in this document are highly**
> **confidential and should be handled accordingly.**

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Revision History

Version	Revision Date	Description
0.9.6	2007/08/21	Revised the update timing of the animations.
0.9.5	2004/10/27	Support for the October 12 version of the G2D library.
0.7.0	2004/08/20	Initial Release.

1 About the G2D Sample Program

The G2D Sample Program shows by example how to use the G2D library.

2 Precautions

These coded instructions, statements, computer programs, and graphics data contain proprietary information of Nintendo of America Inc. and/or Nintendo Company Ltd. and are protected by Federal copyright law. They may not be disclosed to third parties or copied or duplicated in any form, in whole or in part, without the prior written consent of Nintendo.

The sample program is an original product and is not related in any way to the game production team.

3 How to Operate the Sample Program

This table describes the actions you take to operate the sample program.

Table 3-1 How to Operate the Sample Program

Action	Description
START	Starts the game.
+Control Pad Left/Right	Makes Yoshi move in the direction entered.
+Control Pad Left/Right + B Button	Makes Yoshi move quickly in the direction entered.
A Button	Makes Yoshi jump. Pressing the A Button while Yoshi is descending from the jump keeps Yoshi in midair.

4   The Source Tree

This figure shows the directory tree for the G2D Sample Program files.

Figure 4-1 The Source Tree

```
G2D Sample Program Root
                    ┌─────────────┐
                    │    data     │        Data created with NITRO-CHARACTER
                    └─────────────┘
                    ┌─────────────┐
                    │    doc      │        This document
                    └─────────────┘
                    ┌─────────────┐
                    │   include   │        Header file
                    └─────────────┘
                    ┌─────────────┐
                    │    src      │        Source file
                    └─────────────┘
                    Makefile
```
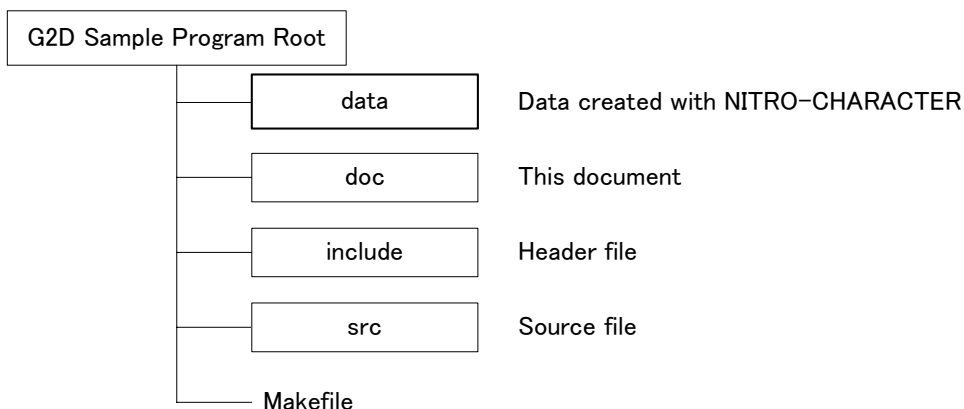
5   The Sample Program's Use of the G2D Library

In the current implementation of the G2D Sample Program, cells are displayed through the use of software sprites. In addition, with the exception of BG data, all data are created using NITRO-CHARACTER.

The sections below explain the sample program in more detail.

5.1 Yoshi

Yoshi is animated using the G2D library's VRAM transfer animation feature.

The VRAM transfer animation method transfers character data for only the currently referenced cell to VRAM. The data are updated one cell at a time to draw animation. For characters like Yoshi, which have many different animation patterns, this method reduces the amount of VRAM used.

Figure 5-1 Schematic of VRAM Transfer Animation
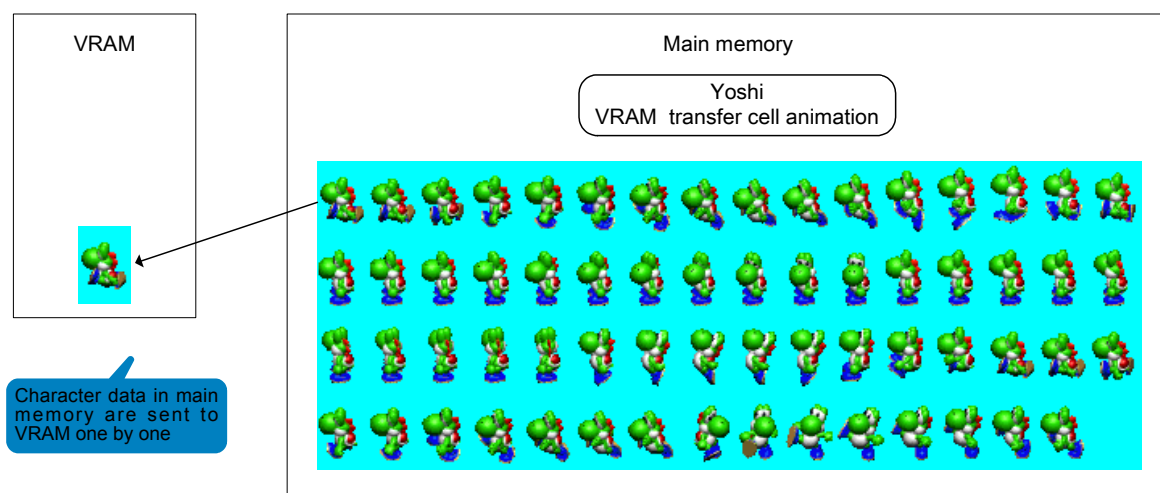
The data includes:

- YOSHI.NCBR (Character file)
- YOSHI.NCER (Cell file)
- YOSHI.NANR (Cell animation file)
- BASIC.NCLR (Color palette file)

To see how this is implemented, see the following sample:

- $(NITROSYSTEM_ROOT)\build\demos\g2d\samples\VramAnimation

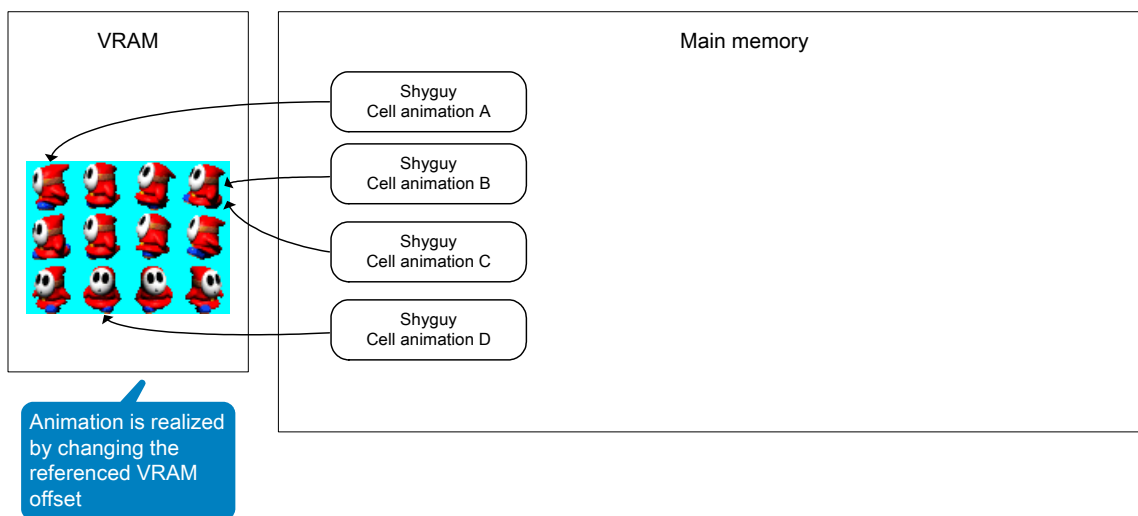In the G2D Sample Program, the corresponding code is implemented in the following sources:

- yoshi_common.c (DrawYoshi function)
- main.c (NitroMain function)
- utility.c (UT_SetUpNitroCharacterData3D function)
- renderer.c

5.2   Shyguy

Shyguy is drawn using normal cell animation.

In this method, all animation patterns are loaded in VRAM, and the VRAM offset is changed to reference different cell character data to draw the animation. Cell animation is used for Shyguy because the same amount of VRAM is used even when animating several Shyguys.

Figure 5-2 Schematic of Cell Animation

The data includes:

- `HEIHO_RED.NCBR` (Character file)
- `HEIHO_RED.NCER` (Cell file)
- `HEIHO_RED.NANR` (Cell animation file)
- `BASIC.NCLR` (Color palette file)

To see how this is implemented, see the following sample:

- `$(NITROSYSTEM_ROOT)\build\demos\g2d\samples\Renderer_Simple`

In the G2D Sample Program, the corresponding code is implemented in the following sources:

- `heiho_red_walk.c` (`HeihoRedWalk` function)
- `heiho_red_die.c` (`HeihoRedDie` function)
- `utility.c` (`UT_SetUpNitroCharacterData3D` function)
- `renderer.c`

5.3   The Pipe

The APIs for drawing software sprites can be divided into two broad methods:

- The first method uses drawing data structures provided in the library. This drawing method is used to animate both Yoshi and ShyGuy.
- The second method does not use data structures. Instead, the drawing is executed by specifying different parameters in function arguments. The drawing of a pipe is an example of the second method, using APIs.

Figure 5-3 Picture of a Pipe

The data includes:

- `PIPE.NCBR` (Character file)
- `PIPE.NCLR` (Color palette file)

To see how this is implemented, see the following sample:

- `$(NITROSYSTEM_ROOT)\build\demos\g2d\samples\SoftwareSprite`
- `$(NITROSYSTEM_ROOT)\build\demos\g2d\samples\SoftwareSprite2`

In the G2D Program Sample, the corresponding code is implemented in the following sources:

- `pipe.c` (pipe function)
- `utility.c` (`UT_SetUpNitroCharacterData3D` function)

5.4   The Background

The background is displayed using the SDK library. For now, the data needed for displaying BG is created as a C source file and then compiled for use. In the future, there are plans to change the data created with NITRO-CHARACTER so it can be displayed using the G2D library.
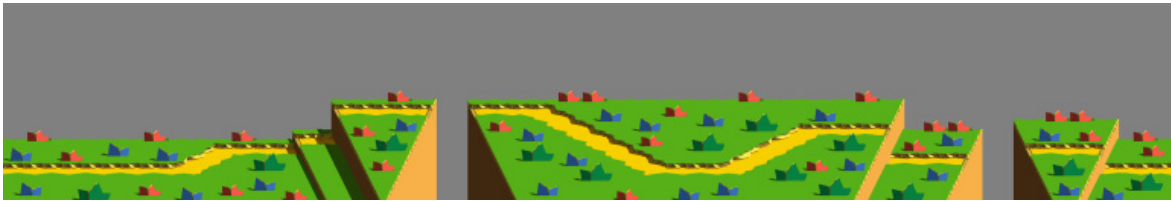
Figure 5-4 BG1 Image

Figure 5-5 BG2 Image

Figure 5-6 BG3 Image

6   Items Not Implemented

The G2D Sample Program does not include every module in the G2D library.

As of October 27, 2004, the following modules are not implemented in the sample program:

- Multicell animation
- Entity