
TWL-System NITRO-Composer

Overview

2008/05/30

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Revision History

Revision Date	Description
2008/05/30	Made revisions in line with the NITRO-System name change (from NITRO-System to TWL-System).
2008/04/08	Changed the format of the Revision History. Changed page headers.
2005/01/31	Added a description related to the NITRO-Player. Changed "NITRO" to "Nintendo DS."
2004/10/12	Added an explanation about the output effects.
2004/08/10	Added an explanation about stream playback.
2004/07/20	Explanation of NITRO-Composer structure was simplified.
2004/06/01	Revisions associated with the implementation of the memory heap library. Slight changes to the "How to read through the manuals" flowchart.
2004/04/12	Made corrections associated with sound tool manual addition. Added figure describing how to read manuals.
2004/04/01	Made corrections associated with sound system manual addition. Added "NITRO-Composer Overview." Made corrections associated with function reference addition.
2004/03/01	Initial version.

1 Introduction

NITRO-Composer is a sound development environment that includes the tools and libraries needed to develop sound for the TWL and Nintendo DS (DS).

2 NITRO-Composer Overview

2.1 Playback Methods

NITRO-Composer has three playback methods: sequence, stream, and waveform playback.

2.1.1 Sequence Playback

Sequence playback uses sequence and sound source data. With sequence playback, the tempo, track volume, and other settings can be changed easily. Sequence playback data can be made smaller than waveform playback data.

Sequence playback is generally used for background music and sound effects. A maximum of 16 sequences (including background music and sound effects) can be played simultaneously.

2.1.2 Stream Playback

Stream playback uses a method that plays and loads into memory waveform data at the same time. Because the sound data can play without storing all the data in main memory, waveform data that extends over a long period of time can still play without using too much memory space.

2.1.3 Waveform Data Playback

Waveform data can be played back as is. Sampled data from microphones and other input can be played back using this playback method.

2.2 Output Effects

All sound output can be modified freely by processing with the CPU. The following effects are provided in the library.

2.2.1 Surround Mode

Surround mode creates the illusion of multi-directional sound with the DS speakers.

2.2.2 Headphone Mode

Headphone mode lessens the intensity of the sound to make listening easier on the ears when using headphones.

2.3 Waveform Data

AIFF and WAV files can be used as waveform data. ADPCM can also be used and will reduce data size to one-fourth of that of other file formats, but can maintain the same level of sound quality as 16-bit PCM.

Playback is possible with the same PSG rectangular waveforms and noise as those used with AGB.

2.4 Sequence Data

For sequence files, standard MIDI files can be used. Effects can be more easily implemented with sequences than with MIDI files because sequences can be coded in text.

There is no difference between the background music and sound effects in how sequence data is handled.

2.5 Maximum Polyphony

The maximum polyphony is 16 voices. However, when the capture feature is in use, the maximum polyphony is 14 voices. With PCM, all 16 voices can be used simultaneously, but with PSG up to six voices can be used. With noise, up to two voices can be used simultaneously.

3 NITRO-Composer Organization

NITRO-Composer is made up of a library and tool.

3.1 Library Organization

The NITRO-Composer library operates on the TWL-SDK and TWL-System. The library can be divided into two parts: the sound drivers and the library.

3.1.1 Sound Drivers

The function names of the sound driver library start with SND. The library provides functions that provide the ability to directly specify sound processes to the ARM7. Because an understanding of how the ARM7 operates is required, the sound driver functions are not usually used directly.

3.1.2 The Sound Library

The function names of the sound library start with NNS_SND. This library provides functions for sound, including the ones for sequence playback and sound data management. As long as these functions are used, there is no need to be concerned with how the ARM7 operates.

3.2 Tool Organization

NITRO-Composer contains tools used to create sound data. These tools can be used to create and verify data easily.

3.2.1 NITRO-Player

This is a Windows application used for checking playback of the created sound data. Playback takes place on the TWL or Nintendo DS, so the actual sound output in the game can be checked.

In addition to sequence and stream playback, tempo change and track mute can be controlled by using the Windows GUI.

3.2.2 Sound Player `SoundPlayer`

SoundPlayer checks converted sound data by playing it on the TWL or Nintendo DS. Unlike NITRO-Player, this tool runs as a standalone program on the TWL or Nintendo DS.

This tool has a simple menu to select sequences and streams for playback.

3.2.3 Various Converters

Converters are provided to convert sequence and waveform data into TWL and Nintendo DS-compatible data.

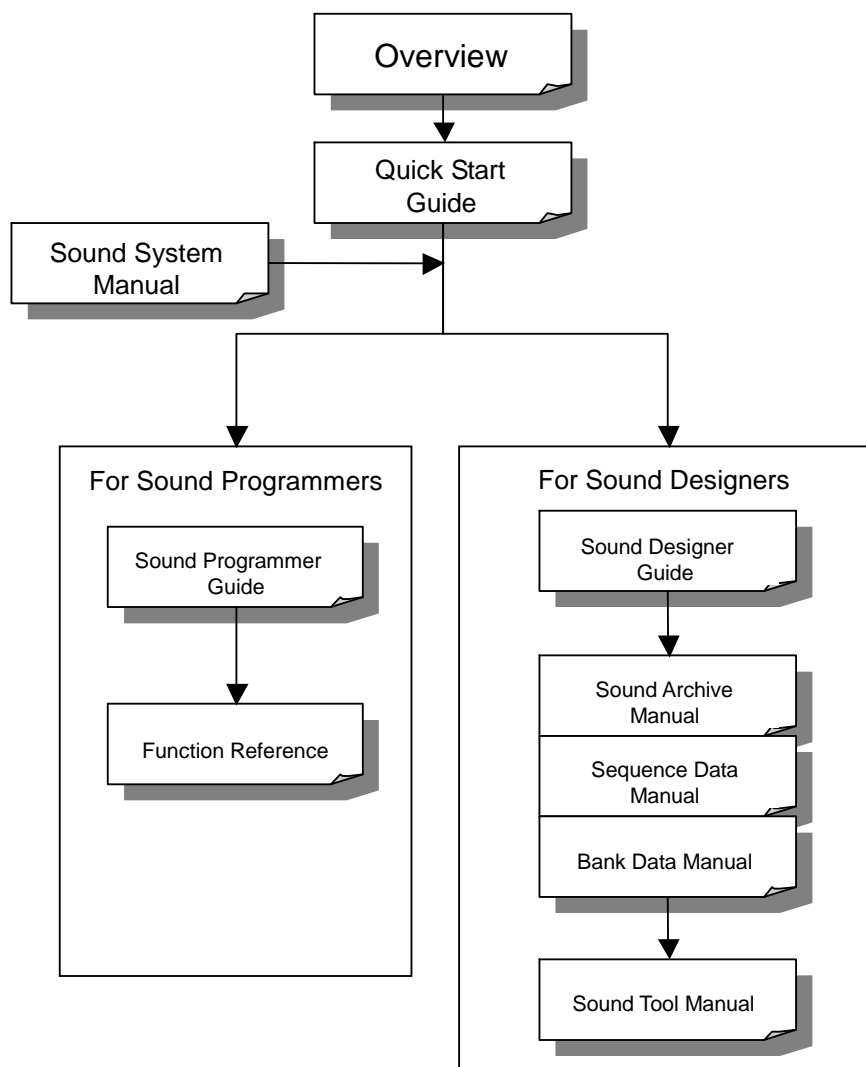
Each data type has a converter, but if one converter is used, all other data type conversions will be performed automatically.

4 Manual Organization

The manuals are divided into two sets. One set is for sound data creators, the other set is designed for sound programmers. In addition to these manuals, there is also a *Quick Start Guide* written for sound data creators and programmers. Start by reading the *Quick Start Guide*.

The manuals are located in the \$TwlSystem/docs/NitroComposer/ directory.

Figure 4-1 Suggested Order for Reading Through the Manuals



4.1 Quick Start Guide

The Quick Start Guide provides instructions regarding the tasks that must be completed before using NITRO-Composer. Using these guidelines, you can set up the NITRO-Composer development environment and run the sample application. See *NITRO_Composer_QuickStartGuide.pdf*.

4.2 Sound System Manual

The Sound System Manual provides an overview of the NITRO-Composer system operations. The introductory information in this manual must be understood before using NITRO-Composer; however, this manual can be reread for reference. See *NITRO_Composer_SoundSystemManual.pdf*.

4.3 Sound Data Creator Manuals

The following sections discuss the sound data creator manuals.

4.3.1 Sound Designer Guide

The Sound Designer Guide explains how sound data producers can create sound data. See *NITRO_Composer_SoundDesignerGuide.pdf*.

4.3.2 NITRO-Player User Manual

The NITRO-Player Manual covers how the NITRO-Player can be used to check sound data playback. Using NITRO-Player makes checking sound data playback more efficient. It may be helpful to reread this manual after initial use of the NITRO-Composer.

The documents related to the NITRO-Player can be found in `$TwlSystem/docs/NitroPlayer`.

4.3.3 Sound Archive Manual

The Sound Archive Manual explains the sound archive in detail. See *NITRO_Composer_SoundArchiveManual.pdf*.

4.3.4 Sequence Data Manual

The Sequence Data Manual explains sequence data in detail. See *NITRO_Composer_SequenceDataManual.pdf*.

4.3.5 Bank Data Manual

The Bank Data Manual explains bank data in detail. See *NITRO_Composer_BankDataManual.pdf*.

4.3.6 Sound Tools Manual

The Sound Tools Manual provides a supplemental explanation about the sound tool. The file is called *NITRO_Composer_SoundToolManual.pdf*.

4.4 Sound Programmer Manuals

The following sections discuss the sound programmer manuals.

4.4.1 Sound Programmer Guide

The Sound Programmer Guide explains the fundamentals of sound programming. The file is called *NITRO_Composer_SoundProgrammerGuide.pdf*.

4.4.2 Function Reference

This manual is the function reference for the sound library. The function reference can be accessed from `$TwlSystem/man/en_US/index.html`.

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