# Wii Programming Guidelines

Version: 1.14

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# Revision History

| Version | Revision Date | Item(s) Affected | Description |
|---------|---------------|------------------|-------------|
| 1.14 | 2009/07/01 | All | (Japanese version only) Standardized the term "RevolutionSDK" to "Revolution SDK," with a space between the two words. |
| | | 2.21.2 | Restrictions on Images Used Instead of Names:<br>• Removed [Recommended] from the title of this section.<br>• Added text explaining that developers must comply with the new subsections (listed below) when illustrating controllers.<br>• Clearly stated that Nintendo provides a *Wii Materials Collection*.<br>Added the following subsections.<br>• Section 2.21.2.1 Creating Illustrations That Users Can Recognize [Required]<br>• Section 2.21.2.2 Displays That Are The Same Color As the Product [Information]<br>• Section 2.21.2.3 Showing the Wii Remote and Strap In the User's Hand [Required]<br>• Section 2.21.2.4 Showing the Wii Remote and Wii Remote Jacket In the User's Hand [Required]<br>• Section 2.21.2.5 Cautions for Illustrations Without the Wii Remote Jacket [Information]<br>• Section 2.21.2.6 Displaying the Nunchuk Cable [Required] |

The revision history for previous versions was moved to Revision History of Previous Versions at the end of this document.

# 1  Overview

*Wii Programming Guidelines* provides programming cautions for the Wii console and peripherals.

## 1.1  Level of Importance

The following notations indicate the relative importance of the topics contained in this document.

- **[Required]**              Items that must be completed.
- **[Recommended]**       Items suggested for improving the quality or performance of your game.
- **[Information]**          Additional items that provide information for game developers.

## 1.2  Wii Programming Guidelines Note

The *Wii Programming Guidelines* are established to reduce problems in the market. However, following these guidelines does not guarantee that all problems will be avoided.

## 1.3  Do Not Use Wii Development and SDK Files on Other Platforms

Do not use the files included in the various Wii SDKs and development tools on other platforms.

## 1.4  Items Warranting Special Mention

Notations such as **[North American Version Only]**, **[North American, European, and Australian Versions]**, and **[Chinese and Korean Versions]** are added to the beginning of headings for guidelines specific to each of these regions.

There are no guidelines specific to Taiwan that differ from those for other regions.

# 2  All

## 2.1  Prohibition of Dependency on Device Specifications [Required]

Avoid designing a program with a dependency on the device specifications of the Wii console or its peripherals, as this may result in a program malfunction or crash.

There will be some specification variance between devices. Performance will also decrease as a device ages or a disc becomes damaged.

Specifically, the devices referred to in these guidelines are the disc drive, disc, Wii Remote, Wii console NAND memory, and SD Memory Card. See the corresponding chapters for details.

## 2.2  Memory and Register Initialization [Required]

The contents of memory are not guaranteed during application program startup. Do not assume a specific initial memory value if memory has not yet been initialized by the application. Similarly, do not use an uninitialized register assuming a specific initial value when using the assembler.

The arena is cleared to zero using `OSInit`.

## 2.3  Startup Time Restriction [Recommended]

Display the Strap Usage screen within 2 seconds of switching to the application.

If the startup time is excessively long, the user may mistake this for a system malfunction.

This does not include the 100 or so frames necessary for switching the display mode from either progressive display to interlaced display, or from EURGB60 display to PAL display.

For more information about the Strap Usage screen, see section 7.1.3 Explanatory Message for Wii Remote Strap Use [Required].

## 2.4  ~~Startup Disc Error Handling [Required]~~ [Deleted]

(Moved to Chapter 3 Wii Game Discs and Drive.)

## 2.5  Compliance with Legal Rights Display [Required]

A separate indication of legal rights is required for some of the library tools provided by Nintendo. Use the specified display method when using a library tool or other item requiring a legal rights display.

Not displaying the legal rights information in the specified method may result in licensing issues.

Note that the legal rights display can be shown in various ways, such as during game startup, in the user's manual, and on the packaging. For details, see the instructions for the individual library tools.

## 2.6  Using the Latest Packages [Recommended]

Always try to use the latest versions of the Revolution SDK and its patches and related tools distributed by Nintendo.

Revisions are made when problems arise.

## 2.7  Removal of Debug Information [Required]

When you are creating the master data, be sure to set the options so that debug information is not included during compiling and linking.

Also, make sure to use the release versions and not the debug versions of the libraries that you link. When using `make`, set `NDEBUG=TRUE` to disable the OS debug code.

If the debug information is left in the master data, it increases program size in addition to decreasing execution speed. Leaving in debug code output may also result in lock-ups.

## 2.8  Prohibition of Device Access Without the Use of a Library [Required]

Do not access individual devices directly without going through the appropriate library.

Problems regarding device compatibility and hardware restrictions were taken into account when the various device libraries of the Revolution SDK were created. Unexpected problems could arise if you directly access devices instead of going through the libraries.

## 2.9  Prohibition of Development Support Libraries in the Release Version [Required]

Do not include development support libraries, such as the Host I/O and MIDI adapter libraries, in the release version master data.

Including development support libraries may cause the Wii system to malfunction.

## 2.10 Guaranteeing Extended Operation of the Application [Required]

Make sure that no fatal bugs such as erroneous processes or lock-ups occur, even if the application is run for a long time.

For example, if continually demonstrating the application overnight in stores, it is conceivable that it will be used continuously for 24 hours or more.

Be careful to avoid lock-ups or other abnormalities due to counter overflows.

## 2.11 ~~Integrating Banners, Comments, and Icons [Information]~~ [Deleted]

See section 8.20 Save Data Comments [Required] and Chapter 12 Icons and Banners.

## 2.12 Application of Wii System Settings [Required]

As applicable, to make it easier to share user-configured values between applications, apply the various settings configured for the Wii console to the application program.

For details, see the following sections for items in the Wii System Settings.

- 4.1 Applying Wii System Sound Settings [Required]
- 6.4 Settings and Display When Progressive Display Is Supported [Required]
- 6.10 Settings and Display for EURGB60 Supported Application [Required]
- 6.16 Settings and Display for Applications That Support the 16:9 Aspect Ratio Display [Required]
- 6.21 Applying Screen Burn-In Reduction Setting [Required]
- 7.1.3 Explanatory Message for Wii Remote Strap Use [Required]
- 11.3 Display Language for the HOME Menu [Required]
- 11.4 Aspect Ratio of the HOME Menu [Required]
- 11.8 Restrictions on Rumble Feature
  - o 11.8.1 Restrictions Due to the Rumble Setting of the HOME Menu [Required]
  - o 11.8.2 Prohibition of Changing the Rumble Setting of the HOME Menu [Required]

## 2.13 Prohibition of Health and Safety Warning Display by Applications [Required]

The Wii console displays a "Health and Safety Precautions" warning message at startup. Nintendo considers this warning screen a blanket warning, so do not include a health and safety warning screen on the application side. There is no problem with displaying a warning screen for the rating of the game's content.

## 2.14 Display at Application Startup [Information] [Deleted]

~~There is no need for the application to display any warning at startup other than the "Health and Safety Precautions" warning message.~~

## 2.15 [North American Version Only] Displaying the ESRB Online Rating Notice for Applications Using Network Features [Required]

If applications released in the U.S. market that are subject to ESRB rating have unrestricted communication between users during a network connection and/or allow users to send and receive elements (user-generated data and so on) not rated by ESRB, it will be noted as a requirement on the "ESRB Rating Certificate" to display the ESRB Online Rating Notice. If the display of the notice is required by ESRB, see the ESRB website (https://www.esrb.org/) to confirm the detailed ESRB requirements (see *ESRB ARC Manual*) and display the notice.

## 2.16 Program Distribution Method [Required]

Do not run programs other than the following.

- Programs included on Wii Game Discs produced by Nintendo
- Programs distributed by the program distribution system provided by Nintendo

Do not write or read in programs from the application using Wii Remote memory, an SD Card, a network, a USB port, Bluetooth, or other kind of interface.

Also, even if data is simply being read using these interfaces, always perform buffer overflow checks and use data signature, authentication, and encryption to ensure programs will not be executed with buffer overflow due to data modification.

## 2.17 Parental Controls [Information]

Using Parental Controls, a parent or guardian can restrict the startup of Wii games that they consider inappropriate for members of their household. The parent or guardian sets the restriction level based on a game's rating; to temporarily release the Parental Controls, they enter a PIN.

Before a master is submitted, each Wii system game must be rated by the appropriate rating agency for each market in which the game is to be released. When creating master data for submission, be sure to enter the rating using the Master Editor program.

Table 2-1 lists the rating agencies for each market.

**Table 2-1 Rating Agencies by Market**

| Market | Rating Agency |
|---|---|
| Japan | CERO |
| North America | ESRB |
| Europe | PEGI, USK, BBFC (varies by country) |
| Australia | AGCB |

The Wii console restricts the startup of games according to the restriction level set by the parent or guardian based on the rating stored in the game. Restricted games can be started only if the correct PIN is entered when the user is prompted for it immediately before startup. Note that applications do not need to perform any special processing for the restrictions based on their rating.

For details, see the *Revolution Master Editor* manual.

## 2.18 [North American, European, Australian, and Korean Versions] License Display of Licensee Titles [Required]

Licensee titles must display the text "Licensed by" followed by the Nintendo logo included with these guidelines for one or more seconds at the channel banner screen.

Developers and publishers should consult with Nintendo if other legal notices make displaying the "Licensed by Nintendo" logo at the channel banner screen difficult.

Display the image included in the *Licensed by Nintendo Screen Package* for "Licensed by Nintendo." This image uses the Nintendo logo.

See the documentation included in the *Licensed by Nintendo Screen Package* for notes on displaying "Licensed by Nintendo" onscreen.

See section 12.7 Display of Trademarked or Copyrighted Names in the Banner [Information] for more information about displaying the text and logo in the banner.

The reason Nintendo provides an image to display "Licensed by Nintendo" is to ensure consistency across all titles. This mechanism will help to counteract worldwide software piracy.

The reason the Nintendo logo is displayed in place of the word "Nintendo" is because it receives stronger protection under the trademark laws of various countries. As a result, it is easier to exercise rights against trademark infringement than when the word "Nintendo" alone is used. It is also possible for Nintendo to swiftly and efficiently make claims against copied software. In other words, this is instrumental in fighting software piracy. If copied or bootleg software includes the Nintendo logo, this trademark infringement can be used as the basis of an infringement case brought against the purveyors of said software. This allows Nintendo to protect its own brand and each licensee's profits from the damages associated with software piracy.

## 2.19 Using Firmware of Specified Versions [Required]

For applications developed with Revolution SDK 3.2 or later environments, use the *extension firmware* (firmware for titles with support for network functionality) when using the USB HID library (included with the Revolution SDK), Revolution SDK Extensions (REX), or Revolution DWC (DWC), and use the "standard firmware" when they are not used.

To determine the specific firmware version to use, see the *Revolution SDK README*.

## 2.20 Time Restriction When Screen Is in Static State [Required]

Do not allow the screen to be in a static state for more than 10 seconds.

The reason for this restriction is that users may become uneasy if the screen remains in an unchanged state for a long period, and may suspect that the Wii console is damaged.

For example, the screen will remain black for a long time if a large DOL file has been specified by the `OSExec*` function, so be aware of the size of the DOL file.

Note that this restriction does not apply if the user can confirm that the screen or the audio will change with controller operations.

Contact support@noa.com if effects in the game require the screen to remain in a static state for longer than 10 seconds, even if the user can confirm that the screen or the audio will change with controller operations.

# 2.21 Terminology and Image Specifications

## 2.21.1 Standardized Terminology [Required]

Adhere to the latest version of the Wii Terminology document for the approved terminology of the Wii console, various parts of the Wii console, terms relating to operation, names of peripheral devices, and all other names.

## 2.21.2 Restrictions on Images Used Instead of Names

For space and design reasons, you may want to use images instead of names, but try to use images that are as close to actual shapes as possible. A little variation in color or design is acceptable if it will not confuse users.

You must comply with the following sections when using controller illustrations.

Nintendo provides controller illustrations bundled as the *Wii-Related Artwork Collection for Use During Gameplay*. (You may also create your own unique illustrations.)

### 2.21.2.1  Creating Illustrations That Users Can Recognize [Required]

Users must be able to recognize the illustrations you create.

There is no problem with creating your own unique illustrations to match the style of other illustrations in your application, but you must not create any illustrations that could be misunderstood by the user.

### 2.21.2.2  Displays That Are The Same Color As the Product [Information]

Display the controller and the strap in colors that match the colors of the actual product.

If the product and the displayed colors are different, the user may mistakenly be led to believe that color variations of the product are commercially available.

If you are using realistic illustrations that are very similar to the actual shapes of the hardware, such as the images in the *Wii Materials Collection*, use colors that are also as close as possible to the commercially available product.

However, it is acceptable to to change the color of part of the controller (for example, highlighting buttons) in order to explain operations.

### 2.21.2.3  Showing the Wii Remote and Strap In the User's Hand [Required]

If your illustration shows the Wii Remote controller being held in a user's hand, you must always display the strap properly attached to the user's wrist.

The exception is applications in which the Wii Remote controller is always held horizontally. For these, the strap does not need to be included in the illustration.

### 2.21.2.4  Showing the Wii Remote and Wii Remote Jacket In the User's Hand [Required]

If your illustration shows the Wii Remote controller being held in a user's hand, refer to 7.1.18.1 Wii Remote Jacket Usage Table for General Applications to determine whether to display the Wii Remote controller with its jacket on.

In applications in which the Wii Remote controller is always held horizontally, the Wii Remote jacket does not need to be included in the illustration.

### 2.21.2.5  Cautions for Illustrations Without the Wii Remote Jacket [Information]

Avoid mixing illustrations showing the Wii Remote controller with its jacket and without its jacket on the same screen.

Users may misinterpret illustrations showing the Wii Remote controller without its jacket to mean that the Wii Remote jacket is to be removed to play the game.

### 2.21.2.6  Displaying the Nunchuk Cable [Required]

Illustrations where the Nunchuck controller and Wii Remote controller are connected must show the cable to make it possible to see that they are connected.

Note that showing the entire cable is unnecessary; you may omit the portion of the cable that is distant from the Wii Remote controller and the Nunchuck controller.

## 2.22  Using the Time from the Wii System Clock

The Wii system clock time can vary greatly if the battery runs out or is changed. If the battery runs out, the time from this clock is undefined.

Applications that use the time from the Wii system clock should support the items detailed in sections 2.22.1 and 2.22.2, below.

## 2.22.1 Procedure When Time of Wii System Clock Differs Greatly from Real Time [Required]

Design your application in such a way that the game's progress is not hindered when the Wii system clock time differs greatly from the actual time.

## 2.22.2 Prompting a User to Check the Current Time [Recommended]

In the following situations, display the Wii system clock time and prompt the user to confirm the actual time:

- At the time of the first startup
- When the current time is significantly off from the previous startup

Users probably take little notice of a deviation in the time, but by prompting them to confirm the time, you can get their attention when the Wii system clock time varies greatly, such as when the battery suddenly dies.

# 3  Wii Game Discs and Drive

## 3.1  Prohibition on Drive Specification Dependency [Required]

Ensure that programs do not run uncontrollably or freeze due to a dependency on drive access speed.

Drive access speed differs depending on the status of the disc and/or drive. Furthermore, specifications regarding drive access speed, cache size, and cache operations may change in the future.

Be sure to thoroughly debug programs so that they do not freeze even when drive access speed suddenly drops, particularly in cases where data is used sequentially, as in movie scenes.

## 3.2  Wii Game Disc Error Handling [Required]

For Wii Game Disc error handling, be sure to comply with the *Wii Optical Disc Drive Guidelines*, unless there is a special reason not to do so.

Having each application handle Wii Game Disc errors differently confuses users.

If there is a special reason to change error handling, contact support@noa.com early in development.

## 3.3  Prohibition of Sustained Continuous Non-Sequential Access [Required]

If there has been no user input for more than 5 minutes (or 10-15 minutes, based on the screen burn-in reduction feature setting), continuous non-sequential disc access should end within 1 hour. Once user input is received, resume normal operations.

*Non-sequential access* is defined as seeking to access data spaced more than 200 MB apart on the disc. Non-sequential access resumed within five seconds for a long period of time can shorten the lifespan of the disc drive. To avoid unnecessary aging of the disc drive while the user is not operating the application, do not conduct this kind of non-sequential access for more than one continuous hour.

For example, when a movie is playing for a long time, position the files that will be accessed nearby and, if non-sequential access will be carried out, limit the number of loops.

For information on the wait time set for the screen burn-in reduction feature, see the *Wii Video Interface Library (VI)* manual and the *Video Interface Library* section of the *Revolution Function Reference Manual*. If you are going to reconfigure the wait time for the screen burn-in reduction feature, see section 6.22 Changing Screen Burn-In Reduction Wait Time [Recommended].

## 3.4 [Multiple-Disc Games Only] Independent Startup of All Discs [Required]

Even if startup of the application from a particular Wii Game Disc is not expected, always make sure that some kind of program is executed when the disc is started independently, even if it is just a warning message. For example, if the inserted Wii Game Disc is one of a set of two Wii Game Discs and the inserted disc is one that cannot be played as a standalone disc, prepare a program that displays a message similar to DISC_06 in the *Wii Message List*.

Not doing so may cause the user to think that there is malfunction in either the Wii console or the Wii Game Disc when a Wii Game Disc is not designed for independent startup.

## 3.5 ~~Normal Operation After the Disc Drive Motor Is Shut Off from a Period of Inactivity [Required]~~ [Deleted]

(Deleted because shutting off the disc drive motor does not affect the development environment currently provided.)

## 3.6 ~~Display for Disc Drive Motor Shut Off from a Period of Inactivity [Recommended]~~ [Deleted]

(Deleted because shutting off the disc drive motor does not affect the development environment currently provided.)

## 3.7 Data Layout for Double-Layer Disc

Applications that support double-layer discs must support the items detailed in sections 3.7.1 and 3.7.2, below.

### 3.7.1 Avoid Disc Access Spanning Layers [Required]

Place a 16MB dummy file (a file that the application does not use) starting from address `0xE7000000`. The actual starting location of the second layer on the disc is `0x0E78A6C00`, but for simplicity this has been rounded up. By locating this 16MB dummy file here, you do not need to worry about the possibility of the `Read` at the layer border having different conditions from the `Read` at another address.

The following is the specific sample code.

```
[LbaOrigin]
0xE7000000="border.dat",+
```

### 3.7.2 Avoid Reading Data to Alternate Layers [Recommended]

Avoid data layouts that require alternating reading between the first and second layer. To minimize reading from different layers, extra steps might be necessary, such as placing the same data on both layers. Switching between the first and second layer adds extra latency.

## 3.8  Startup Disc Error Handling [Required]

Always include disc error handling routines (including error display) in programs read by the Wii Menu.

If there is no error handling routine (error display) in sections read by the Wii Menu, errors that occur before error handling routines are read will not be processed.

For details on error handling, see the *Wii Optical Disc Drive Guidelines*.

## 3.9  Resetting and Shutting Down in Response to Fatal Errors [Required]

Disable controller operations, RESET, and the Power Button while a fatal error message is being displayed. Fatal errors indicate a state where it may not be safe to even reset the Wii console, so continue to display the error message without resetting or shutting down.

For more information about fatal error messages, see section 3.11 Message Display in Response to Fatal Errors [Required].

## 3.10 Resetting and Shutting Down in Response to Disc Errors Other than Fatal Errors [Required]

For "No Disc," "Wrong Disc," or "Retry" errors, when a reset operation occurs, perform reset processing and return to the Wii Menu. If the Power Button on either the Wii console or the Wii Remote is pressed, perform shutdown of the system immediately.

For information about the optical disc drive library displaying fatal error messages automatically, see Chapter 10 Reset and Shutdown.

## 3.11 Message Display in Response to Fatal Errors [Required]

If you call the `DVDSetAutoFatalMessaging(FALSE)` function at the start of the application to disable the feature that automatically displays fatal error messages, display DISC_04 in the *Wii Message List* in response to fatal errors.

As long as this feature is not disabled by calling the aforementioned function, the optical disc drive library will display fatal error messages automatically. The automatically displayed message will reflect DISC_04 from the latest version of the *Wii Message List* at the time the Revolution SDK being used was released. Consequently, the message may be different from the latest *Wii Message List* depending on which Revolution SDK version and language is being used, but this is not considered to be a problem.

## 3.12 Prohibiting Disc Access Using the CNT Library in the Release Version [Required]

Disc access using the CNT library is prohibited in the release version of a disc application because the CNT library handles errors differently than the optical disc drive library.

# 4  Sound

## 4.1  Applying Wii System Sound Settings [Required]

If there are no menus in the application where the user can select sound settings, apply monaural, stereo, or surround sound from the Wii system sound settings during startup. Also, if there is a menu in the application where the user can select sound settings, apply the sound setting of the Wii system as an initial value during the initial startup of the application.

In either case, applications do not need to provide a sound mode for each of the sound settings that can be selected on the Wii console (monaural, stereo, and surround). For example, applications that do not support surround sound output may use stereo output when the Wii console is configured to use surround sound.

Applications that do not support monaural sound may also use stereo output when the Wii console is configured to use monaural sound. Game progress may be hindered by the user's sound environment, however. For details, see section 4.5 Considerations for the User's Sound Output Environment [Information].

## 4.2  ~~Sound Setting on the Wii Console [Required]~~ [Deleted]

(Deleted because it was restructured as section 4.1 Applying Wii System Sound Settings [Required].)

## 4.3  ~~Sound Output for Applications Supporting Multiple Sound Settings [Required]~~ [Deleted]

(Deleted because it was restructured as section 4.1 Applying Wii System Sound Settings [Required].)

## 4.4  Do Not Modify the Audio Playback Frequency Within an Application [Required]

Although the Wii audio system supports playback at a frequency of either 32 kHz or 48 kHz, once one of these frequencies has been set for an application at startup, be sure not to change the frequency setting again. The ability to change the playback frequency is limited due to hardware specifications.

## 4.5  Considerations for the User's Sound Output Environment [Information]

To avoid considerable disadvantages to the user, try hard to always keep the user's sound output environment in mind. For example, consider a case in which a user, who has a television that supports only monaural sound, has configured the Wii console to use monaural sound and expects monaural output. In this environment, some audio will be cut for applications that use stereo output, as described above.

# 5  Photosensitivity

## 5.1  About Photosensitivity and These Guidelines [Information]

These guidelines are intended to be used in the development of video games for the Wii platform. Unlike films and television programs, which produce only one sequence of images each time they are played, one video game can produce an infinite sequence of images. This is because video games are interactive, so that each time a game is played, a different sequence of pictures and images will be displayed, depending on the choices and inputs made by the game's player or (in the case of multiplayer games) players. In addition, the luminance of images displayed in three-dimensional games are not simply those of the video game artist's original image, but are the result of the game's programming processes, which render the image in a three-dimensional form in a three-dimensional space, with variations of light, shadow, distance, orientation and player perspective. These variables also are affected by choices made by the individual player.

Because of these infinite variations that are possible within a single game, it may be possible with many games that certain player inputs will cause screen imagery that will exceed the suggested limits described below. Developers should try to design games that comply with the limits when the games are played with normal gaming strategies and inputs, with the recognition that it may still be possible for player inputs to cause sequences of images that may exceed the suggested limits, particularly if the gameplay is idiosyncratic or counterintuitive. It must also be remembered that compliance with these guidelines or with any other guidelines that have been or will be developed may reduce the incidence of photosensitive seizures, but they will not eliminate them or eliminate seizures that occur during video gameplay from causes other than the visual content of the games.

These guidelines attempt to take what medical science has learned about the images that can trigger photosensitive seizures in the universe of susceptible individuals and, in a few paragraphs, apply it to the infinite variety of imagery produced by modern video game technology. Medical research in this area is still developing, and the particular susceptibilities of photosensitive persons vary widely from individual to individual. As the developers of other guidelines have recognized, it is impossible to craft guidelines that will eliminate all risk of seizures, and the measures taken should be proportionate to the risks involved and should not stifle developers' creativity, imagination, or freedom of expression. It may be possible that a game, even though complying with the guidelines, may produce a problematic sequence. Alternatively, a sequence out of compliance with the guidelines may not be problematic in its context. It is therefore recommended that all games, before final release, be reviewed by one or more persons knowledgeable about photosensitivity who can check for potentially problematic sequences. It is also recommended that such persons review decisions to deviate from the guidelines when that may be desirable for the artistic or creative imperatives of a game.

These guidelines use the following lighting technology terms.

- *Luminance* is a quantifiable measurement of the observed brightness of an object—in this case, of a video screen.

- *Nits* is a shorthand name for candelas per square meter, the metric system's measurement unit for luminance. (A candela is a measure of the candle power or angular density of light from a source).

- A *photometer* is a device that measures the luminance of an object. A photometer with CIE characteristics is calibrated to match the response to various color spectra of the average human eye.

- The *RGB value* of a color in a video display is a three-number representation of the intensities of, respectively, the red, green and blue elements of the display that combine to form the color. Each value is a number from 0 to 255. Consequently, an RGB value of (0,0,0) is black; and RGB value of (255,255,255) is white; and an RGB value of (255,0,0) is pure red.

A video with sample footage has been prepared to illustrate and supplement the guidelines. When a portion of the guidelines is illustrated by the video, the guidelines include a reference to the relevant section of the video. The video provides supplemental illustrations and is not an essential part of the guidelines, which can be used without the video.

## 5.2  Restrictions on Flashing Images and Lights [Recommended]

Do not use a sequence of images that:

(a)    flashes so that the change in luminance of the flash exceeds 20 nits (candelas/meter$^2$), and

(b)    occupies more than one quarter of the screen, and

(c)    has more than three flashes occurring in any one second period.

The sample video contains examples of luminance changes of different magnitudes in sections 1 (1), 1 (2), and 1 (3).

A flash is a pair of opposing changes in luminance: that is, an increase in luminance followed by a decrease or a decrease followed by an increase. If the luminance measurements of successive flashes over time are plotted using *x* and *y* coordinates (*x*=time, *y*=luminance), the shape of the resulting plot will appear in profile as alternating peaks (frames of localized maximum brightness) and valleys (frames of localized minimum brightness). Flashes should be evaluated for the change in luminance between adjacent peaks and valleys. In games for NTSC monitors, no more than three of these peaks (or, alternatively, no more than three valleys) should occur in any 30 consecutive frames. In games for PAL monitors, no more than three peaks (or, alternatively, no more than three valleys) should occur in any 25 consecutive frames.

Screen luminance can be measured or calculated as described in section 5.6 Screen Brightness Calculations [Information].

## 5.3  Restrictions on Flashing Saturated Red Colors [Recommended]

Do not use a sequence of images in which:

(a)    the images produce flashes (regardless of the change in luminance of the flashes), and

(b)    one of the images contains saturated red, and

(c)    the saturated red occupies more than one eighth of the screen, and

(d)    more than three flashes occur in any one second period.

The sample video contains examples of red flashing in sections 2 (1), 2 (2), and 2 (3).

Saturated red is a color whose RGB value for red is greater than 85 percent of the sum of the color's RGB values.

## 5.4  Restrictions on Image Reversals [Recommended]

If the luminance of the elements of an image that occupies more than one quarter of the screen is switched or interchanged (for example, switching between the negative and positive of an image or black and white images in which the black turns white while the white turns black, as in the samples below), the changes in luminance should not exceed 20 nits or occur at a rate faster than that allowed for flashing in section 1.
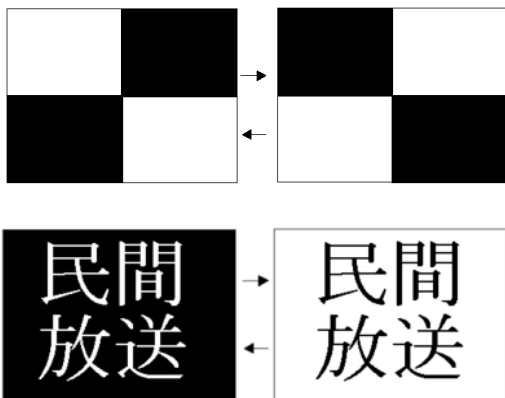


The sample video contains examples of images with switching luminance in sections 3 (1) and 3 (2).

## 5.5  Restrictions on Regular Patterns [Recommended]

Do not use an image that:

(a)    consists of striped patterns composed of parallel lines or dots or other regular elements with distinct edges, such as the samples below, and

(b)    has "high contrast" between the bright and dark elements of the pattern, as defined below, and

(c)    occupies more than one quarter of the screen, and

(d)    has more than five light–dark pairs of stripes in any orientation.

An image has "high contrast" when:

(i)     the luminance of the brighter element of the pattern is 30 nits or more, and its contrast is greater than 40% (contrast is ($L1$-$L2$)/($L1$+$L2$), where $L1$ is the luminance of the brighter element of the pattern and $L2$ is the luminance of the darker), or

(ii)    the luminance of the brighter element of the pattern is less than 30 nits and the difference in luminance between the brighter and darker elements ($L1$-$L2$) is 17 nits or more.

The sample video contains examples of patterns in sections 4 (1), 4 (2), 4 (3), and 4 (4).

The stripes may be parallel or radial, curved or straight, black and white, or a combination of colors. Avoid especially stripes that oscillate or flash and moving stripes that change direction. Do not switch the luminance of the lighter and darker stripes (so that the dark become light and vice versa). Striped patterns that flow smoothly across, into, or out of the screen in one direction may be used. Checkerboard patterns and plaids are acceptable.
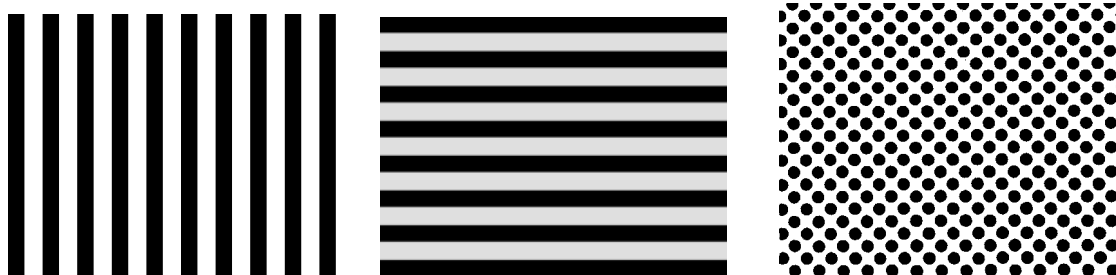
## 5.6  Screen Brightness Calculations [Information]

Three methods can be used to measure luminance for games displayed on a cathode ray tube (CRT) TV screen.

1. First, screen luminance can be measured directly from a monitor with a hand-held spot photometer with a CIE characteristic designed for making measurements from a television screen. For consistency, the display brightness and contrast should first be set up using PLUGE (Rec. ITU-R BT.814) with peak white corresponding to a screen illumination of 200 nits. This corresponds to the display conditions of the "home viewing environment" described in Recommendation ITU-R BT.500.

2. Second, the luminance (monochrome) voltage can be used to determine the emitted light output of a television display that matches the "home viewing environment" described in the preceding paragraph. The following graph and table show the typical relationship between voltage and screen luminance for such a display in the NTSC format.

## Screen Light Output in Nits versus Luminance Voltage
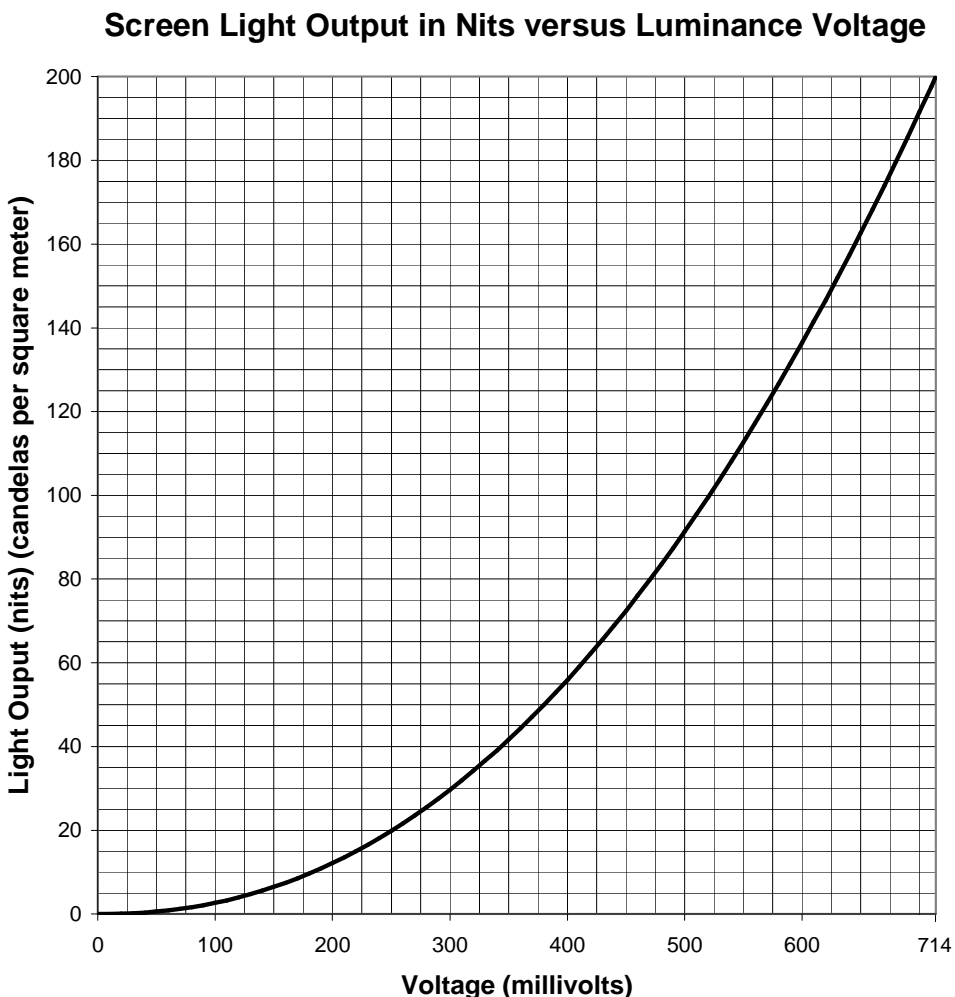


| Voltage (mV) | Light (cd/m²) |
|---|---|
| 0 | 0.00 |
| 25 | 0.13 |
| 50 | 0.58 |
| 75 | 1.41 |
| 100 | 2.65 |
| 125 | 4.33 |
| 150 | 6.46 |
| 175 | 9.07 |
| 200 | 12.17 |
| 225 | 15.76 |
| 250 | 19.88 |
| 275 | 24.51 |
| 300 | 29.69 |
| 325 | 35.40 |
| 350 | 41.67 |
| 375 | 48.50 |
| 400 | 55.90 |
| 425 | 63.88 |
| 450 | 72.44 |
| 475 | 81.59 |
| 500 | 91.33 |
| 525 | 101.68 |
| 550 | 112.64 |
| 575 | 124.21 |
| 600 | 136.40 |
| 625 | 149.22 |
| 650 | 162.67 |
| 675 | 176.75 |
| 700 | 191.47 |
| 714 | 200.00 |

The relationship between voltage and luminance is determined by the following formula:

$$L = \left(\frac{mV}{714}\right)^{2.2} \times 200$$

In this formula, *L* is luminance in nits or candelas per square meter, and *mV* is luminance voltage in millivolts.

3. Third, luma (*Y*), which the Wii console converts and outputs, can be calculated from the RGB values (from 0 to 255 each) of the Wii software side, by using the following formula:

$$Y = 0.257 \times R + 0.504 \times G + 0.098 \times B + 16$$

*Y* is a value between 16 and 235. When NTSC composite video or S-terminal video outputs white 100%, the analog output voltage is 714 mV (except the synchronized level). These relationships result in the following formula for converting RGB into screen luminance in nits on an NTSC display:

$$L = \left[\frac{0.838 \times R + 1.643 \times G + 0.319 \times B}{714}\right]^{2.2} \times 200$$

Therefore, the luma, analog voltage, and luminance of each color is as follows, when a standard color bar is displayed:

| Display Color (R/G/B) | Y (Digital Value) | Analog Voltage (mV) | Luminance (nits) |
|---|---|---|---|
| White (255/255/255) | 235 | 714 | 200 |
| Yellow (255/255/0) | 210 | 633 | 153 |
| Light Blue (0/255/255) | 169 | 501 | 92 |
| Green (0/255/0) | 144 | 419 | 62 |
| Purple (255/0/255) | 106 | 295 | 29 |
| Red (255/0/0) | 81 | 214 | 14 |
| Blue (0/0/255) | 40 | 81 | 2 |
| Black (0/0/0) | 16 | 0 | 0 |

The preceding calculations assume that the programmer has selected a gamma (γ) of 1.0, as recommended in the section "Gamma Correction" in the Revolution Graphics Library, contained in the Revolution SDK. If a different gamma is selected, it must be accounted for in the formula:

$$L = \left[\frac{213.714 \times \left(\frac{R}{255}\right)^{\frac{1}{\gamma}} + 418.169 \times \left(\frac{G}{255}\right)^{\frac{1}{\gamma}} + 81.498 \times \left(\frac{B}{255}\right)^{\frac{1}{\gamma}}}{714}\right]^{2.2} \times 200$$

# 6  Video

## 6.1  Display Within the Safe Frame [Recommended]

Decide on the display position based on the importance of the information to be displayed.

The size of the safe frame in Wii depends on the specific TV set. However, in general, with a 4:3 aspect ratio, the safe frame width will be approximately 84.4 percent of the maximum valid horizontal display width in the horizontal direction and approximately 80.8 percent of the maximum valid vertical display height regardless of the display format. With a 16:9 aspect ratio, the safe frame horizontal width and vertical height will both be approximately 87 percent of the maximum valid display frame.

For details on safe frames, see the *Wii Video Interface Library (VI)* manual.

## ~~6.2  Video Settings [Information]~~ [Deleted]

(Deleted because this content overlapped with other paragraphs in Chapter 6 Video.)

## 6.3  Support for Progressive Display [Recommended]

We recommend adding application support for progressive display output.

However, this recommendation need not be followed when it is not feasible because field rendering is used or for other reasons.

## 6.4  Settings and Display When Progressive Display Is Supported [Required]

If the application supports progressive display, support the display format selected on the Wii console's TV Resolution setting screen to present either an interlaced display or progressive display.

## 6.5  Procedure for Switching from Progressive Display to Interlaced Display [Recommended]

If the scan mode is progressive display when your application starts, but your application does not support progressive display, use the following procedure to switch the screen to interlaced display.

[Black screen] → [Switch from progressive to interlaced] → [Black screen] → [Wait for around 100 frames] → [Strap Usage screen]

Only do this switch once. During the switch between interlaced and progressive display, the screen will be distorted and require a few dozen frames before returning to normal.

For details on display switching, see "Recommendations for Progressive Display" in the *Wii Video Interface Library (VI)* manual.

To read about the Strap Usage screen, see section 7.1.3 Explanatory Message for Wii Remote Strap Use [Required].

## 6.6  ~~Addition of Interlaced/Progressive Switch Operation [Recommended]~~ [Deleted]

(Deleted because there is no operation switching display mode from interlaced to progressive.)

## 6.7  ~~Reset Operation During Progressive Output [Recommended]~~ [Deleted]

(Deleted because the information duplicates the content in section 6.5 Procedure for Switching from Progressive Display to Interlaced Display [Recommended].)

## 6.8  Televisions That Support Progressive Output [Recommended]

Avoid displaying important messages in small fonts, natural images, or per frame flash effect in non-interlaced (double-strike mode) display.

Some televisions that support progressive output may perform scan line interpolation. You may not be able to achieve the desired screen display on such a television.

## 6.9  PAL 50 Support [Required]

Always support PAL 50 in the European and Australian versions of the application.

## 6.10 Settings and Display for EURGB60 Supported Application [Required]

If the application supports EURGB60, display in either PAL 50 or EURGB 60, based on the mode configured on the Wii console.

## 6.11 Switching from EURGB60 to PAL [Recommended]

If the TV mode is EU RGB 60 when your application starts but your application does not support EU RGB 60, use the following procedure to switch the screen to PAL.

[Black screen] → [Switch from EU RGB 60 to PAL] → [Black screen] → [Wait for around 100 frames] → [Strap Usage screen]

Only do this switch once.

During the switch between PAL and the EURGB60 display, the screen will be distorted and require a few dozen frames before returning to normal.

For details on display switching, see "EURGB60 Mode" in the *Wii Video Interface Library (VI)* manual.

For details on the Strap usage screen, see section 7.1.3 Explanatory Message for Wii Remote Strap Use [Required].

## 6.12 ~~Addition of PAL/EURGB60 Switch Operation [Recommended]~~ [Deleted]

(Deleted because there is no operation switching from PAL to EU RGB 60.)

## 6.13 ~~Reset Operation During EURGB60 Output [Recommended]~~ [Deleted]

(Deleted because the information duplicates the content in section 6.11 Switching from EURGB60 to PAL [Recommended].)

## 6.14 ~~Maintaining Appropriate Video Output [Required]~~ [Deleted]

(Deleted because this is checked by the Video Interface library, so the application does not need to support it.)

## 6.15 Display Method for the 16:9 Aspect Ratio [Recommended]

When supporting a 16:9 aspect ratio, we recommend implementing the anamorphic widescreen technique.

The anamorphic widescreen technique horizontally compresses 16:9 aspect ratio video so that it ends up with a 4:3 aspect ratio. The technique produces widescreen video with higher quality and higher resolution than the letterbox method.

Anamorphic widescreen video can be restored to the original 16:9 video by having the television stretch out the display uniformly in the horizontal direction. This type of television display mode is generally referred to as "full," and most widescreen televisions support display in full mode.

Moreover, Wii prompts users to set the television to full mode when the screen mode has been set to 16:9 in the Wii System Settings.

For details, see the *Wii Video Interface Library (VI)* manual.

## 6.16 Settings and Display for Applications That Support the 16:9 Aspect Ratio Display [Required]

If an application supports the 16:9 aspect ratio, be sure that the display is done in either the 4:3 or the 16:9 aspect ratio, depending on the aspect ratio set for the Wii console.

Although it is acceptable for an application to have a separate aspect ratio setting, the Wii console settings should be referenced when the application is first launched and reflected in those separate settings.

Applications not supporting the 16:9 aspect ratio may ignore the Wii console setting.

## 6.17 Trap Filter [Recommended]

When there is a large contrast in brightness, such as with a white font on a black screen or a black font on a white screen, and a small font size is used, enable the trap filter.

If the trap filter is disabled when displaying such an image on some CRT television sets with high contrast, the effect of cross color may become pronounced and distort the outlines of characters.

## 6.18 Support for the 4:3 Aspect Ratio [Required]

Applications must always offer support for the 4:3 aspect ratio. Do not create applications on the assumption that they will only be displayed in the 16:9 aspect ratio.

For details, see the *Wii Video Interface Library (VI)* manual.

If your application is based on the mode with 16:9 aspect ratio, rather than preparing a separate screen with 4:3 aspect ratio you could instead create a letterboxed screen with bands at the top and bottom, outside the rendering area, and use it as the 4:3 aspect ratio mode.

For more information on displaying static images, see section 6.24 Avoiding Screen Burn-In Caused by Static Display [Information].

## 6.19 Checking the On-Screen Display During Application Startup [Required]

Regardless of the display mode used for the Wii menu, you must verify that an application can be displayed normally. Although applications are not required to support all display modes (progressive, EURGB60, and 16:9), the Wii menu does include all display modes. For example, applications that do not support progressive display must be displayed normally even if the Wii menu is being displayed in progressive mode.

For more information, see the *Wii Video Interface Library (VI)* manual.

## 6.20 Check Before Switching to Progressive Display [Required]

Before switching to progressive display, get the scan mode in the Wii Menu using the `VIGetScanMode` function and then switch to the appropriate display method based on that information.

See the "Progressive Display" chapter in the *Wii Video Interface Library (VI)* manual for more information on how confirmation is actually done.

## 6.21 Applying Screen Burn-In Reduction Setting [Required]

When the screen burn-in reduction setting on the Wii console is ON, do not disable the screen burn-in reduction feature with the application.

In situations where the power to the Wii Remote Pointer will be turned off and on repeatedly, make sure this does not have the effect of repeatedly resetting the screen burn-in reduction feature, since this in effect renders the feature inoperative. (See section 7.2.4 Disabling Pointer for Applications with Pointer Function [Recommended] to read about turning the power to the Pointer on and off.) If it is necessary to disable the screen burn-in reduction feature due to application specifications regardless of the console settings, first determine whether to disable the feature after meeting the following two conditions and giving due consideration to whether there is a possibility of screen burn-in occurring.

- Prepare video appropriate for televisions of 4:3 and 16:9 aspect ratios.

  By supporting televisions of both 4:3 and 16:9 aspect ratios, you can supply the appropriate video output regardless of the user's television aspect ratio.

- The display of all pixels output from the Wii console changes.

  Even if characters are moving, if the camera is fixed and there is a fixed display, such as TIME or SCORE, then it cannot be said that the display for all the pixels changes. So, do not disable screen burn-in reduction.

For details, see the *Wii Video Interface Library (VI)* manual and function reference.

## 6.22 Changing Screen Burn-In Reduction Wait Time [Recommended]

Unless required otherwise, do not change the wait time before the screen burn-in reduction from the default of five minutes. In addition, if the value is to be changed, do not set a value longer than required.

### 6.22.1 ~~Restrictions for Non-Activation of Screen Burn-in Reduction [Required]~~ [Deleted]

(Deleted because it was restructured as sections 6.21 Applying Screen Burn-In Reduction Setting [Required] and 6.22 Changing Screen Burn-In Reduction Wait Time [Recommended].)

## 6.23 Support for 16:9 Aspect Ratio [Recommended]

Support for the 16:9 aspect ratio is recommended.

This is because 16:9 widescreen televisions are expected to become predominant in the future.

For details, see the *Wii Video Interface Library (VI)* manual.

If your application is based on the mode with the 4:3 aspect ratio rather than preparing a separate screen with the 16:9 aspect ratio, you could instead create a pillarboxed screen with bands on the sides, outside of the rendering area, and use it as the 16:9 aspect ratio mode.

See section 6.24 Avoiding Screen Burn-In Caused by Static Display [Information] for more information on displaying static images.

## 6.24 Avoiding Screen Burn-In Caused by Static Display [Information]

Although the Wii console has a feature to decrease display brightness in order to reduce screen burn-in, be aware that other factors (such as those listed below) may cause screen burn-in, depending on the television's display method.

- Only the area of the 4:3 aspect ratio is drawn for a 16:9 display, and the margins to the left and right are filled in with static images.
- The margins above and below the drawing area, such as during playback of movies, are filled in with static images.
- Text such as times and scores that do not change for long periods and are displayed continuously.

In general, when static images or non-moving text are displayed brightly (that is, displayed using colors that are close to the primary colors), screen burn-in will be particularly noticeable for text, its surrounding area, and boundary lines between static images and animated areas.

If it is necessary to generate a static display, such as in the examples listed above, you may want to consider applying the following methods in order to avoid screen burn-in.

- Confine to 15 minutes situations wherein the same content is displayed continuously.
- Use a display that has low overall brightness.
- Change the brightness of the display.
- Display margins with the same approximate brightness as the drawing area.
- When changing screens, use the same color or pattern as the margin uses for the entire screen.

## 6.25 Standardizing Aspect Ratios [Required]

Within your application, standardize the aspect ratio that is used to display packages provided by Nintendo, such as the Strap Usage screen and the HOME Menu.

For example, when an application only supports a 4:3 aspect ratio, including a 16:9 aspect ratio for the HOME Menu would be prohibited.

If the aspect ratio only differs for packages provided by Nintendo, as in this example, the user must either put up with the situation or manually make temporary changes to the screen settings whenever the application switches the aspect ratio (because the television aspect ratio will not switch automatically).

## 6.26 Interlaced Display When Supporting Double-Strike Mode [Required]

Allow interlaced display when double-strike mode is supported.

Otherwise, some televisions and projectors will not be able to display properly in double-strike mode.

# 7  Controllers

## 7.1  All Controllers

### 7.1.1  Display When a Controller Other than the Wii Remote Is Necessary [Required]

When a controller other than the Wii Remote is required, the application should display a message similar to message CONT_01 or CONT_02 in the *Wii Message List* at startup or before the controller is to be used by the application.

The purpose of this requirement is to inform the user of the need for a controller other than the Wii Remote for gameplay.

If more than one type of controller is required, this information should be displayed for each type.

However, it is optional to display a message for an extension controller that connects to the Wii Remote only when it is confirming that this controller has been connected.

For more information on startup processing for applications that require a USB keyboard, see section 14.4 Processing During Startup When a Keyboard Is Required [Required].

### 7.1.2  Avoiding Game Design Forcing Extended Continuous Operation or Strenuous Activity [Information]

To prevent the user from experiencing physical injuries such as RSI, avoid game designs that force the following types of controller operations for extended periods of time.

- Strenuous actions, such as swinging around
- Repetitive motion in a single direction
- Keeping the controller frozen in a stationary position

In particular, make sure the game design does not require users to compete using strenuous actions or to repeat strenuous actions for an extended period of time to progress in the game.

We recommend inserting an appropriate number of scenes where no controller operations are necessary.

Also, during development, use multiple game testers to evaluate whether excessive stress is placed on the body.

### 7.1.3  Explanatory Message for Wii Remote Strap Use [Required]

Immediately after starting an application that uses the Pointer, Motion Sensor, or both, display a message prompting the user to check that the Wii Remote wrist strap is attached. The message should also indicate that when using a controller connected to the Wii Remote, including the Nunchuk, put the wrist strap through the connector hook.

Be sure to use the image and text included in the Wii Strap Reminder package to prompt strap attachment. Unless you have obtained Nintendo's prior permission, this image and text must be used

by all software. In addition to the image and text for prompting use of the strap, the prompt screen also includes an image and text for prompting use of the safety hook when using the Nunchuk. See the Wii Strap Reminder package for the display sequence of these texts and images.

Select the text and images to be displayed in the strap attachment prompt screen from English, French, and Spanish for North American market software; and English, German, French, Spanish, Italian, and Dutch for European market software, based on the language setting of the Wii console. Note that this language selection is separate from the language supported by the software application.

There may be games where this requirement is not necessary, such as where the controller use is limited to horizontal use of the Wii Remote and you are holding it with both hands. Contact support@noa.com if you believe your game design does not require the Strap Usage screen.

For applications that support the Wii Zapper, see section 7.4.1 Displaying the Wii Zapper Usage Screen [Required].

## 7.1.4  Handling +Control Pad Input [Required]

Make sure that simultaneously pressing the up and down or left and right directional buttons on the +Control Pad of the Wii Remote, Classic Controller, and Nintendo GameCube Controller does not cause program malfunctions or other problems.

Up and down input or left and right input can be provided at the same time depending on the usage environment.

Ways to handle simultaneous pressing of the up and down or left and right buttons are as follows.

- Attach priority levels to up/down and left/right directions.
- Treat the input as NULL (no input).

Although prohibition processing takes place in the WPAD library for the +Control Pad on both the Wii Remote and Classic Controller, other measures are required to handle bitwise-OR'ed input from both.

## 7.1.5  Operations on the Unused Buttons [Required]

Make sure there is no program malfunction when an unused button is pressed. This also applies to cases where second or third controllers are used or where a non-supported extension controller is used in an application that uses only the first controller.

There is a chance for a button not used in the application to be input. Unexpected inputs may also come from peripheral devices.

Be especially careful when a button not used in the application can perform actions, such as the startup of debug mode.

## 7.1.6  Lower Limit Value of the Control Stick and Button Analog Input Value [Recommended]

To prevent the application from acknowledging input when Control Sticks or buttons are not being used, give an extra allowance to the lower limit value.

When a user is not touching the Control Sticks or any buttons, the coordinates given by the Control Sticks or the buttons will not necessarily be those of the origin point. The offset given here will vary for each controller, and will further show some variance each time the controller is used.

See the entries for `WPADClampStick` and the various clamp functions in the PAD library.

### 7.1.7  Taking Differences Between Analog Values from Buttons and Control Sticks into Account [Required]

Use a range of values that allow input from any controller when the origin has been set correctly. This is because there are differences among individual controllers, which can cause buttons and Control Sticks that receive analog input to have different possible input ranges.

For example, a Control Stick on one controller may not necessarily give the same input value as the Control Stick on another controller when both are tilted as far as possible.

For information on the range of values that can be input from any controller when the origin has been set properly, see the reference for the various clamping functions in the WPAD and PAD libraries.

### 7.1.8  Support for Analog Input Values Defined for Control Sticks and Buttons [Required]

Prevent irregular behavior for any value that is returned within the range defined for each controller. The range of possible input values from buttons and Control Sticks that get analog input is defined for each controller type.

When the origin has been set correctly, a Control Stick will not necessarily return the maximum value or the minimum value when, for example, it is tilted as far as possible. When the origin has shifted, on the other hand, the Control Stick may return the maximum or minimum value even if it has not been tilted as far as its limit.

### 7.1.9  Regarding Applications That Support the Rumble Feature [Required]

In applications that require the Rumble Feature for the player to progress, make sure to have an alternative presentation using images or sounds when the Rumble Feature is turned off so that the application can progress without problems. Not doing so will cause problems when the user has turned off the Rumble Feature or is using the WaveBird controller, which has no Rumble Feature.

We consider an application that requires the Rumble Feature to be one that cannot be finished without using the Rumble Feature.

The enabled state of the Nintendo GameCube Controller Rumble Feature can be checked with the return value of the `PADRead` function.

### 7.1.10 Avoiding Continuous Operation of the Rumble Motor [Recommended]

If possible, avoid continuous operation of the Rumble Motor.

A Rumble Motor that operates indefinitely from a single button press is not desirable from both a safety and a product lifespan point of view.

### 7.1.11 Stopping Rumble Motor When Controller Not in Use [Required]

The Rumble Motor must be stopped during a pause or after a reset. Also, do not start the Rumble Motor after turning on or resetting the console until there is some form of controller input. In particular, make sure not to use the Rumble Feature with the demo screen.

A Wii controller that is vibrating because the Rumble Motor is running while not in the user's hand may fall from a table or a desk.

### 7.1.12 Rumble Motor Run/Stop Switch Frequency [Recommended]

Do not switch between running and stopping the Rumble Motor more frequently than 100 times a second. Due to the wireless specifications, controlling the Rumble Motor at higher frequencies is difficult.

### 7.1.13 Hot Swapping Extension Controllers [Recommended]

Do not have the user insert/remove extension controllers unless it is necessary. This is to reduce connector wear.

### 7.1.14 Frequency Band Usage When Using a Wireless LAN [Information]

The Wii Remote uses the same 2.4-GHz frequency band as some wireless LANs. The WPAD library has therefore been equipped with functionality for automatically avoiding interference.

### 7.1.15 Do Not Use Origin Reset Command for Extension Controller Analog Input as Game Input [Required]

Do not use commands in applications that include use of the – Button, + Button, A Button, and B Button at the same time, since this command is used to reset the origin for analog input to the extension controller. The origin can be reset by holding these buttons down for 3 seconds.

### 7.1.16 Processing Hot Swapping of Unsupported Extension Controllers [Required]

Make sure that the application operates normally when an unsupported extension controller is connected or disconnected.

While an unsupported extension controller is connected, do one of the following.

- Display a warning message and stop game progress until the extension controller is disconnected.
- Operate the Wii Remote processes as if no controller is connected (input handling for the extension controller is unspecified).

To verify behavior when an unsupported extension controller is hot swapped, the `WPADAttachDummyExtension` and `WPADDetachDummyExtension` are provided for debugging purposes. For usage information, see the WPAD library function reference in Revolution SDK.

### 7.1.16.1  User Notification Regarding Hot Swapping of Unsupported Extension Controllers [Recommended]

While an unsupported extension controller is connected, we recommend displaying a message that notifies the user that an unsupported extension controller is connected, even when you are using the same processing as when no extension controller is connected.

## 7.1.17 Handling HOME [Required]

Do not use HOME for any purpose other than displaying the HOME Menu. For details about the HOME Menu, see Chapter 11 HOME Menu.

## 7.1.18 Handling of the Wii Remote Jacket [Required]

Comply with the following guidelines on how to handle the Wii Remote Jacket in an application.

Applications are divided into two groups: general applications and applications that support the use of Wii Remote attachments (such as the Wii Zapper and Wii Wheel). Follow the appropriate item corresponding to a title's gameplay.

In principle, equivalent support for the following items applies to instruction manuals as well.

### 7.1.18.1  Wii Remote Jacket Usage Table for General Applications

General applications are divided into three categories that determine whether the Strap Usage screen and the Wii Remote Jacket confirmation screen are required.

  I.   Games controlled by swinging the Wii Remote quickly, frequently or with a high range of motion

  II.  Games that are controlled normally and do not fit in either Category I or III

  III. Games controlled exclusively by holding the Wii Remote horizontally with both hands, or by using the Wii Remote in a manner equivalent to a television remote control

Although it is difficult to distinguish between Categories I and II, refer to the Examples row in Table 7-1 to decide how your game would be categorized.

See section 7.1.18.2 Wii Remote Jacket Usage Table for Applications Using Attachments for information on applications that support Wii Remote attachments such as the Wii Zapper and the Wii Wheel.

**Table 7-1 Wii Remote Jacket Usage Table for General Applications**

| Type | General Application | | |
|---|---|---|---|
| **Category** | **I** | **II** | **III** |
| Wii Remote Operations (see Examples) | Game controls that involve swinging the Wii Remote quickly, frequently, or with a high range of motion | Normal game controls that are not applicable to either Category I or III | Game controls for which the Wii Remote is always held horizontally with both hands, or controls that are equivalent to the remote control for a television |
| Examples[1] | *Wii Sports*<br>*Mario Party 8*<br>*Mario & Sonic at the Olympic Games* | *Super Mario Galaxy*<br>*Big Brain Academy: Wii Degree*<br>*WarioWare: Smooth Moves* | *Fire Emblem: Radiant Dawn*<br>*Virtual Console titles*<br>*News Channel* |
| Strap Usage screen | Required | | Not required (acceptable if present) |
| Screen and messages to confirm that the Wii Remote Jacket has been attached | Display if the person in charge of game development believes it should be required[2]<br>(If you plan to display, contact support@noa.com to inform Nintendo ahead of time of the control and content of the display.) | | N/A |
| | Display recommended | Display not required | |
| The Wii Remote Jacket in images within descriptions of the controls and other text that shows the Wii Remote being held<br>(includes animations that show how to swing the Wii Remote or other controllers, even if not being held in a hand) | The person in charge of game development should consider this issue based on the controls and make this determination[2] | | No Wii Remote Jacket (acceptable if present) |
| | Images with the Wii Remote Jacket are recommended | No Wii Remote Jacket (acceptable if present) | |
| The Wii Remote Jacket in demo movies and videos within games<br>(when in-game characters are holding the Wii Remote in their hands) | The person in charge of game development should consider this issue based on the controls and make this determination[2] | | No Wii Remote Jacket (acceptable if present) |
| | Images with Wii Remote Jacket are recommended | No Wii Remote Jacket (acceptable if present) | |
| The Wii Remote Jacket in images of the Wii Remote by itself<br>(in descriptions of the buttons and other such cases) | No Wii Remote Jacket (acceptable if present) | | |

---

[1] Note that the titles given are examples of usage, but the Strap Usage screen and implementation of attaching the Wii Remote Jacket might differ from the table for some titles due to their release dates.
[2] The basic policy is that other than the requirement to display the Wii Remote Jacket on the Strap Usage screen, the person in charge of the game's development should determine whether the Wii Remote Jacket is required for the game. This determination should be made with a full understanding of the reasons why Nintendo released the Wii Remote Jacket.

### 7.1.18.2  Wii Remote Jacket Usage Table for Applications Using Attachments

Attachments such as the Wii Zapper and Wii Wheel cannot be attached to the Wii Remote along with the Wii Remote Jacket. Therefore, applications that use them differ from general applications.

Applications that use attachments, as shown in the examples below, are divided into two categories: *attachment-only applications* and *attachment-compatible applications.* Attachment-only applications assume that an attachment will be used, without consideration for playing styles that do not use an attachment. For example, *Link's Crossbow Training* uses the Wii Zapper exclusively and is therefore always packaged with a Wii Zapper. Attachment-compatible applications provide playing styles for both using and not using an attachment.

The illustration for the Strap Usage screen will differ for each type of attachment, so if a screen illustrating how to hold the controller is required, prepare a usage screen specific to each attachment. For example, an application that uses the Wii Zapper requires the Wii Zapper Usage screen, but there is no need to prepare a usage screen for the Wii Wheel.

Follow the instructions in Table 7-1 for attachment-compatible applications when an attachment is not in use. The inclusion of the Strap Usage screen is determined on a case-by-case basis.

**Table 7-2 Wii Remote Jacket Usage Table for Applications Using Attachments**

| Type | Attachment-Only Application | Attachment-Compatible Application |
|---|---|---|
| Category | Use of the attachment is required for play | Playable with or without the attachment |
| Examples | *Link's Crossbow Training* | *Mario Kart Wii* |
| Strap Usage screen | N/A | Required |
| Attachment Usage screen | Depends on the specifications for the attachment (for example, the Wii Zapper screen is required for the Wii Zapper) | |
| Screen or Message to confirm that the Wii Remote Jacket has been attached | Prohibited | |
| The Wii Remote Jacket in images within descriptions of the controls and other text that shows the Wii Remote being held (includes movies that show how to swing the Wii Remote or other controllers, even if not being held in a hand) | No Wii Remote Jacket (display the Wii Remote connected to the attachment) | |
| The Wii Remote Jacket in demo movies and videos within games (when in-game characters are holding the Wii Remote in their hands) | No Wii Remote Jacket (display the Wii Remote connected to the attachment) | |
| The Wii Remote Jacket in images of the Wii Remote by itself (in descriptions of the buttons and other such cases) | No Wii Remote Jacket (display the Wii Remote connected to the attachment) | |

**Note:**  The basic policy is that other than the requirement to display the Wii Remote Jacket on the Strap Usage screen, the person in charge of the game's development should determine whether the Wii Remote Jacket is required for the game. This determination should be made with a full understanding of the reasons why Nintendo released the Wii Remote Jacket.

## 7.2  Wii Remote

### 7.2.1  Using the Relative Distance Between the Wii Remote and the Sensor Bar [Recommended]

Be sure to use a relative distance for the distance to the Sensor Bar. For example, do not use an absolute distance such as the distance in centimeters between the Wii Remote and the Sensor Bar.

### 7.2.2  ~~Handling HOME [Required]~~ [Deleted]

(Moved to section 7.1 All Controllers.)

### 7.2.3  Disabling Pointer for Applications Without Pointer Function [Required]

To save battery power in the Wii Remote, turn off power to the Pointer in applications other than the HOME menu that do not use the Pointer functionality.

For details about the HOME Menu, see Chapter 11 HOME Menu.

### 7.2.4  Disabling Pointer for Applications with Pointer Function [Recommended]

Even if the application does use the Pointer function, turn off power to the Pointer in scenes that do not use the Pointer. This is to preserve battery power in the Wii Remote.

It is not necessary to disable and enable the Pointer frequently. You can disable and enable the Pointer with the `WPADControlDpd` function in the WPAD library. When using the KPAD library, you can disable it with the `KPADDisableDPD` function and enable it with the `KPADEnableDPD` function.

**Note:**  The two latter functions internally call the `WPADSetDataFormat` function, so if the Pointer is turned on and off, the data format will change. As a result, the burn-in reduction feature will be rendered inoperative.

To read about the burn-in reduction feature, see section 6.21 Applying Screen Burn-In Reduction Setting [Required] in the *Wii Video Interface Library (VI)* manual and the "Video Interface Library" section of the *Revolution Function Reference Manual*.

### 7.2.5  Prohibition of Simultaneous Use of Wii Remote Memory and Wii Remote Speaker [Required]

The Wii Remote speaker cannot be used while accessing Wii Remote memory. Stop using one before using the other.

The reason for this is that the Wii Remote speaker cannot output correctly if it is used at the same time as the Wii Remote memory.

### 7.2.6  Restriction on Contents of Data Written to Wii Remote Memory [Required]

Store data in Wii Remote memory in such a way that it will not interfere with game progress if data is lost.

This requirement is due to the fact that there is a possibility that data in Wii Remote memory may be overwritten when another game is played.

Only use Wii Remote memory to store data that can be recovered from data in Wii console NAND memory when data is lost, or to store temporary data that will not interfere with game progress even if lost.

### 7.2.7  Wii Remote Data Error Checking [Required]

When using data from Wii Remote memory, always perform error checking using a method such as checksum. Also, if an error is detected through error checking, make sure that this does not cause any lock-ups.

Example of error checking:

   3884 bytes data + 4 bytes checksum

### 7.2.8  Message Display When Writing to Wii Remote Memory [Required]

When writing data to Wii Remote memory, display a message similar to CONT_03 in the *Wii Message List* to prevent the user from inserting or removing an extension controller while writing to Wii Remote memory.

This is due to the fact that some data being written to Wii Remote memory may be corrupted if the extension controller is removed or inserted during a write operation.

### 7.2.9  Message Display When Loading Wii Remote Memory [Recommended]

When reading data from the Wii Remote memory, display a message similar to CONT_03 in the *Wii Message List* to prevent the user from inserting or removing the extension controller while reading Wii Remote memory.

Data read from Wii Remote memory may be corrupted if the extension controller is inserted or removed during a read operation.

### 7.2.10 Handling WPAD_ERR_TRANSFER or WPAD_ERR_BUSY Errors When Writing to Wii Remote Memory [Required]

Be sure to perform verification after writing data to Wii Remote memory. If `WPAD_ERR_TRANSFER` or `WPAD_ERR_BUSY` errors occur during verification, attempt to rewrite as many as three times.

If rewriting to the Wii Remote memory fails three times because of `WPAD_ERR_TRANSFER` or `WPAD_ERR_BUSY` errors, then the Wii Remote controller is physically damaged. In this case, display the CONT_04 error message exactly as written in the *Wii Message List*.

### 7.2.11 Handling WPAD_ERR_TRANSFER or WPAD_ERR_BUSY Errors When Reading from Wii Remote Memory [Required]

If `WPAD_ERR_TRANSFER` or `WPAD_ERR_BUSY` errors occur while reading data from Wii Remote memory, either attempt to reread up to three times or use error correction on the data that was read.

If rereading from the Wii Remote memory fails three times because of `WPAD_ERR_TRANSFER` or `WPAD_ERR_BUSY` errors, the Wii Remote controller is physically damaged. In this case, display the CONT_04 error message exactly as written in the *Wii Message List*.

## 7.2.12 Data Compatibility for the Same Application Using Wii Remote Memory [Required]

Maintain compatibility of the save data when releasing post-release updates to game programs.

## 7.2.13 Prohibition of Operations Dependent on Wii Remote Memory Access Speed [Required]

The Wii Remote memory's access speed depends on various external factors, such as signal conditions. Make sure that there are no memory access speed-dependent operations that may result in an application malfunction.

## 7.2.14 Handling Data Corruption in Wii Remote Memory [Recommended]

When an error is detected using a checksum of the data in Wii Remote memory or by other such means, or if the `WPADReadGameData` function returns `WPAD_ERR_BROKEN`, display a message similar to CONT_05 in the *Wii Message List*.

After displaying the message, it is acceptable to overwrite the data in Wii Remote Memory.

## 7.2.15 Displaying a Message when Overwriting Wii Remote Memory [Required]

When overwriting data from another game in the Wii Remote memory, display a message similar to CONT_06 or CONT_07 in the *Wii Message List*.

## 7.2.16 Continuous Play on the Wii Remote Speaker [Recommended]

If data is played from the Wii Remote speaker for more than 8 continuous minutes, the sound may crackle or skip. To prevent sound from crackling or skipping, we recommend implementing one of the following two measures within 8 minutes after sound starts playing.

- Send `WPAD_SPEAKER_ON` with the `WPADControlSpeaker` function and then restart the speaker.
- Do not send sound to the Wii Remote for 1 second or more.

Crackling and skipping is caused because the speed of sound processing on the Wii console and Wii Remote do not match exactly for the individual hardware. When the Wii console speed is faster, crackling occurs; when the Wii Remote speed is faster, skipping occurs.

## 7.2.17 Processing when No Output Occurs on the Wii Remote Speaker [Recommended]

For scenes where sound is not output from the Wii Remote speaker for a period of time, we recommend stopping the speaker by sending `WPAD_SPEAKER_OFF` with the `WPADControlSpeaker` function.

However, if the speaker is frequently started and stopped for scenes with sound frequently output, Wii Remote operations may be affected. It is acceptable to choose not to frequently start and stop the speaker in these situations. We recommend that in place of starting and stopping you leave the speaker on and turn MUTE ON/OFF by sending `WPAD_SPEAKER_MUTE_OFF` and `WPAD_SPEAKER_MUTE` with the `WPADControlSpeaker` function.

## 7.2.18 Speaker Sound Quality Under Poor Signal Conditions [Recommended]

When playing sound from the Wii Remote speaker, we recommend checking the signal conditions using the `WPADCanSendStreamData` function. This is to prevent sound from crackling due to specifications when signal conditions are poor.

Applications cannot detect crackling sounds. The `WPADCanSendStreamData` function returns whether crackling is occurring at the time when sound is sent to the Wii Remote. When `TRUE` is returned, sound can be sent without crackling. However, if data is not sent when `FALSE` is returned, note that that portion of sound is omitted (skipped). In addition, if sound is not sent from the result of the return value of the `WPADCanSendStreamData` function, there is no need to restart the speaker in regards to the skipping.

For specific use of this function, see the WPAD sample demo in Revolution SDK.

## 7.2.19 Displaying a Message Notifying the User That Battery Charge Is Low [Recommended]

When informing the user that Wii Remote battery power is low, display either an icon or a message similar to CONT_09 in the *Wii Message List*.

While it is true that the user can confirm the battery charge for the Wii Remote at any time using the HOME Menu, the application might encounter problems if the battery for the Wii Remote were to suddenly become depleted.

## 7.2.20 Displaying a Message Notifying Users That Wii Remote Transmissions Have Terminated [Recommended]

When Wii Remote communications have been interrupted, display a message similar to CONT_10 in the *Wii Message List*.

This is to prevent a situation where, for example, during an action-intensive game, communication from the Wii Remote is suddenly terminated, and the game progresses without the user understanding the reason for the sudden loss of control.

## 7.2.21 Application of Pause Function at Termination of Wii Remote Communication [Information]

It is preferable to pause the application when communication from Wii Remote is terminated.

### 7.2.22 Specification of Simple Pairing Procedure [Required]

Applications supporting simple pairing must perform this synchronization when the 1 Button and the 2 Button are pressed simultaneously.

The same buttons are used as the simple pairing in the HOME Menu to avoid user confusion.

### 7.2.23 Message Displayed During Simple Pairing [Required]

Applications supporting simple pairing must display a message similar to CONT_11 in the *Wii Message List* when performing simple pairing.

### ~~7.2.24 Display Format for Simple Pairing [Required]~~ [Deleted]

(Deleted so that the term "One Time Mode Synchronization" is mentioned only in the *Wii Terminology* like other terms.)

### 7.2.25 Use of Function WPADSetSpeakerVolume Prohibited [Required]

Adjust the Wii Remote speaker volume from the application by converting waveform data sent to the Wii Remote instead of using the `WPADSetSpeakerVolume` function.

### 7.2.26 Settings for Automatic Disconnection of Wii Remote Communications [Recommended]

The time limit for automatically disconnecting communication with the Wii Remote should not be made longer than the default 5 minutes unless absolutely necessary. If you do change it, do not set it to an unnecessarily long time.

This is to keep battery consumption of the Wii Remote to a minimum.

For example, in cases where a movie lasting 5 minutes occurs within a game and there will not be any user operations for a long time, there is no problem with extending the time limit in light of the length of the movie. However, we recommend restoring the time limit to the default 5 minutes after returning to the game.

The time limit for automatic disconnection can be set with the `WPADSetAutoSleepTime` function.

It is acceptable to make the time limit for automatic disconnection shorter than 5 minutes. For example, because the default setting for screen burn-in reduction is also 5 minutes, it is acceptable to set the automatic disconnection time to 4 minutes to avoid making it more difficult for the user to see the "Communications with the Wii Remote have been interrupted" message, which would otherwise appear almost simultaneously with the dimming of the screen.

See sections 6.22 Changing Screen Burn-In Reduction Wait Time [Recommended] and 7.2.20 Displaying a Message Notifying Users That Wii Remote Transmissions Have Terminated [Recommended].

## 7.2.27 Handling When a Wii Remote Is Connected to a Player Number Not Used by the Application [Recommended]

If Wii Remotes are connected to player numbers not being used, we recommend they be disconnected immediately in order to keep the battery consumption of these Wii Remotes to a minimum.

For example, assume that two Wii Remotes can be used by a particular application. If Wii Remotes with player numbers 3P or 4P are connected while this application is running, you should disconnect them immediately.

When returning to the application from the HOME Menu, a Wii Remote may have been connected in the HOME Menu, so verify the Wii Remote connection count restrictions.

## 7.2.28 Handling Wii Remote Acceleration Noise [Required]

If your application makes use of very small acceleration values, be sure to keep in mind the existence of Wii Remote acceleration noise.

For more information, see the *Wii Controller Overview*.

# 7.3 Peripheral Devices That Connect to the Nintendo GameCube™ Controller Sockets

Applications that support the Nintendo GameCube Controller and other peripherals that connect to the Nintendo GameCube Controller Sockets must support the following features.

## 7.3.1 ~~Application Support for the Nintendo GameCube Controller [Information]~~ [Deleted]

(The content of this item was moved to section 7.3 Peripheral Devices That Connect to the Nintendo GameCubeTM Controller Sockets because it is a description that relates to the entire section.)

## 7.3.2 Use of Origin Reset Command as Game Input Prohibited [Required]

To avoid resetting each stick and trigger when performing actions necessary in the application, do not create a command involving simultaneous pressing of the GameCube Controller's X Button, Y Button, and START/PAUSE in the application.

The Nintendo GameCube Controller is designed to reset the origin for each stick and trigger by holding down the X Button, Y Button, and START/PAUSE simultaneously for 3 seconds.

## 7.3.3 Support for Origin Reset Command [Required]

To avoid user confusion, make sure the application will not react in an unexpected manner when the Control Stick and the R Button, L Button, and C Stick on the GameCube Controller are reset.

### 7.3.4 Hot Swapping Support for Peripheral Devices That Connect to the Nintendo GameCube Controller Sockets [Required]

Support hot swapping for the Nintendo GameCube Controller Socket being used.

The user may insert or remove a Nintendo GameCube Controller in the middle of running the application. Execution of the Nintendo GameCube Controller origin reset command and Nintendo GameCube WaveBird<sup>TM</sup> Wireless Controller channel switching will also result in a state similar to that of Controller hot swapping.

Call the `PADReset` function for sockets that return the error value `PAD_ERR_NO_CONTROLLER`.

### 7.3.5 Frequency of Checks for Hot Swapping [Recommended]

When inserting peripheral devices that connect to the Nintendo GameCube Controller Sockets, make sure that there is no delay before controls are enabled in the application.

Otherwise, this delay would temporarily impede players' game progress.

### 7.3.6 Nintendo GameCube WaveBird Wireless Controller Support [Information]

The WaveBird can be treated the same as a standard Nintendo GameCube Controller.

Note that the WaveBird communicates over the 2.4-Hz band, which may affect the following:

- Wi-Fi communication by the Wii console
- Communication when WiiConnect24 is turned on
- Communication by a Nintendo Wi-Fi Connection-compatible application
- Wii Remote communication

### 7.3.7 Stopping Access to the Optical Disc Drive in Scenes Where the User Is Prompted to Insert Devices into or Remove Devices from the Nintendo GameCube Controller Sockets [Required]

Stop access to the optical disc drive in scenes where the user is urged to insert devices into or remove devices from the Nintendo GameCube Controller Sockets. This is because, for example, if the user knocks over the Wii console during removal or insertion and jolts it, the disc or optical disc drive may be damaged.

### 7.3.8 Prohibiting Applications That Require the Nintendo GameCube Controller [Required]

It is prohibited to create applications that require the Nintendo GameCube Controller. For example, do not make games that cannot be finished without using the Nintendo GameCube Controller.

### 7.3.9  Joint Use of the Nintendo GameCube Controller and Wii-Specific Peripheral Devices [Recommended]

We recommend that applications with support for the Nintendo GameCube Controller also support the same type of controls using Wii-specific peripheral devices, such as the Nunchuk or Classic Controller.

### 7.3.10 Restrictions on Peripheral Devices That Connect to the Nintendo GameCube Controller Socket [Required]

It is prohibited to use peripheral devices, other than the Nintendo GameCube Controller, that connect to the Nintendo GameCube Controller Sockets and provide control schemes that cannot be performed on a Wii-specific peripheral device.

### 7.3.11 Providing Rumble Feature Settings [Required]

Provide an independent option to allow the Rumble Feature to be enabled or disabled for the Nintendo GameCube Controller in applications that use the Rumble Feature with the Nintendo GameCube Controller. This requirement is separate from restrictions on the Rumble Feature for the Wii Remote.

See section 11.8 Restrictions on Rumble Feature for information on Rumble Feature restrictions for the Wii Remote.

## 7.4  Wii Zapper

Applications that support the Wii Zapper must support the following items.

(For applications that support the Wii Zapper and the Wii Wheel, see the *Wii Controller Overview* for precautions for game design.)

### 7.4.1  Displaying the Wii Zapper Usage Screen [Required]

Display the Wii Zapper Usage screen for applications that use the Wii Zapper.

For details, see the Wii Zapper Usage Screen package.

# 8 Wii Console NAND Memory

## 8.1 Restrictions on Wii Console NAND Memory [Required]

The limits shown in Table 8-1 are placed on the size of the home directory and the `/tmp` region that can be allocated by each application. Do not exceed these upper limits.

**Table 8-1 Usage Limitations for Wii Console NAND Memory**

| Directory | Max Size | Number of Files/Directories |
|-----------|----------|-----------------------------|
| Home directory | 16 MB | 32 |
| /tmp | 40 MB | 64 |

These restrictions are necessary because Wii console NAND memory is shared with other applications.

**Note:** Save banner files are also subject to size and file number restrictions.

## 8.2 Limits on Frequent Rewrites [Required]

To reduce wear on Wii console NAND memory, avoid unnecessary calls to functions that update the FAT. For example, avoid excessive writing to Wii console NAND memory, like saving every second or every time the character moves.

If you are using an auto-save feature, set the frequency to once a minute at the most. If there are mini-games that take less than a minute and are played repeatedly, this rule cannot be followed. In such cases, it is acceptable to save with a frequency of more than once a minute sometimes, just as long as the average frequency for your overall application is once a minute at the most.

If you are using the `NANDSimpleSafe` series API for auto-saving, set the frequency even lower at once every 4 minutes at the most.

The following functions update the FAT.

- `NANDCreate[Async]`
- `NANDCreateDir[Async]`
- `NANDDelete[Async]`
- `NANDMove[Async]`
- `NANDClose[Async]`
- `NANDSafeOpen[Async]`
- `NANDSafeClose[Async]`
- `NANDSimpleSafeOpen[Async]`
- `NANDSimpleSafeClose[Async]`
- `NANDSimpleSafeCancel[Async]`

## 8.3  Error Handling [Required]

Always include an error handling routine (including error display) for Wii console NAND memory.

For details on error handling, see "NAND Processing Sequence" in the *Revolution Function Reference Manual*.

For error types and response policy, see "Handling Result Codes" on the "Introduction" page of the NAND API description in the *Revolution Function Reference Manual*.

## 8.4  Write Operation Display [Required]

When writing save data larger than 1 MB to Wii console NAND memory, display a message or icon that clearly indicates to the user that a write operation is underway. This is to prevent the user from unintentionally destroying data important to the user by turning off power or resetting the Wii console while writing data to Wii console NAND memory.

For example, display a message similar to NAND_09 in the *Wii Message List* during the write operation itself.

It is acceptable to display the message for a longer time than it actually takes to perform write operations to make the message easier for the user to comprehend.

If the file is a temporary file or a saved file that would not create a grave disadvantage for the user even if the data contents were lost, then this display is not required.

## 8.5  Data Compatibility Within the Same Program [Required]

Maintain save data compatibility even if there is a change made to the program after mass production.

## 8.6  Applications Dependent on Wii Console NAND Memory Access Speed Prohibited [Required]

Make sure there is no program malfunction or crash because of a dependency on access time to Wii console NAND memory.

This is required because there is performance variance between individual devices. Performance will also decrease as the device ages.

## 8.7  Handling Reset While Writing [Required]

If a reset is performed in the middle of a write operation, writing will be interrupted, causing a potential loss of data. Always verify the end of the write operation before performing a reset.

## 8.8  Data Unit for Users [Required]

When notifying users of information such as available memory or the size of files, use units of 128 KB and use the term "block(s)."

When notifying the user of the required number of block(s), be sure to total the size of files required by the game in file system block units, and count the equivalent number of bytes in 128 KB blocks and display. Be sure to round up any fractional part that is less than 128 KB.

For example, assume that a given game uses the following files.

Banners/icons:          32 KB

File 1:                 128 KB

File 2:                 16 KB

In this case, the total size is 176 KB. In blocks, this is one block with a remainder of 48 KB. In this case, round the fractional part up and display "2 blocks" for the size.

In addition, when informing the user of the available memory, please display the number of bytes of available memory in blocks of 128 KB. If the available memory is less than 128 KB, then use a rounded numerical value.

Be sure to note that there is a difference between the block unit used for users and the "file system block" (equal to 16 KB) used by the Wii console NAND memory file system.

## 8.9  Checking the Number of Free inodes and Amount of Free Memory Using NANDCheck[Async] [Required]

Before creating a new file or directory in the home directory, always check to see if it is possible to create the file or directory by calling the `NANDCheck[Async]` function. The `NANDCheck[Async]` function determines whether there are enough free inodes and free memory in the file system.

## 8.10 Timing for Checking the Number of Free Inodes and the Amount of Free Memory [Required]

Be careful when you call the `NANDCheck[Async]` function to check the amount of available memory and the number of available inodes. The following type of problem may arise if you check only just before saving data without paying particular attention to the exact timing of the check.

Assume that a user is playing the time attack mode of a certain racing game. After the player achieves the best time, he or she attempts to save that best time and ghost data but a NAND message is displayed informing the user that there is not enough space available to save the data.

In this scenario there will be no trace of the best time and the ghost data. To avoid this type of problem, use the `NANDCheck[Async]` function to check resource availability and create needed files ahead of time.

## 8.11 Notification When the Number of Inodes or the Amount of Free Memory Is Insufficient [Required]

If the `NANDCheck[Async]` function finds that there are not enough available inodes or available memory, be sure to notify the user by displaying an appropriate message. For example, display a message similar to NAND_02 or NAND_03 in the *Wii Message List*.

There are situations where there is no need to inform the user why the save could not be done. If there are files that have no effect on gameplay, even if they are not created or saved, and the application will not notify the user that such files have been created, there is no need to display a message.

The `OSReturnToDataManager` function has been prepared for times when users want to reorganize the contents in Wii console NAND memory. This function exits the executing application and moves to the Wii Menu's data management screen.

If there is insufficient free space or not enough inodes, defer to the user and allow a transition to the Data Management screen in the Wii Menu.

An exception to this would be a game that can be started without save data. In this case, the game can be played even when there are insufficient inodes or free space, so you do not need to allow the user to go to the Data Management screen.

When there is insufficient memory available and an insufficient number of available inodes at the same time, give higher priority to the message about there being insufficient memory available.

## 8.12 Do Not Change Created File Size [Required]

In general, do not change the size of files once created. This is to prevent insufficient memory or applications becoming unable to proceed due to increase in file size while an application is running. Be sure to create files that are large enough to begin with.

Contact support@noa.com in the case of applications that are impractical without variable file size.

## 8.13 Handling Corrupted Files [Required]

If a NAND function returns the result code `NAND_RESULT_ECC_CRIT` or `NAND_RESULT_AUTHENTICATION`, or if the size of the save file differs from the size expected by the application program, display a message similar to NAND_07 in the *Wii Message List* indicating that data has been corrupted and that the file cannot be used. Allow the user to delete the old files and to create new ones.

## 8.14 Handling Corrupted Wii Console NAND Memory [Required]

Be sure to display the NAND_08 message exactly as written in the *Wii Message List* if `NAND_RESULT_CORRUPT` is returned as the result code for a NAND function.

Also, disable the controller input, RESET, and Power Button while the error message is displayed.

Because NAND_RESULT_CORRUPT indicates a state where even a successful reset is not guaranteed, continue to display the error message instead of performing a reset or shutdown.

## 8.15 Saving Data During the Shutdown Process [Recommended]

If pressing of the Power Button has been detected, applications must quickly begin shutdown processing. If the application needs to save some data (such as the overall play time of the application) in Wii console NAND memory during shutdown, make sure that saving can be completed within 1 second.

For details, see section 10.2 Wii Power Button [Required].

## 8.16 Prohibition of Creating Files or Directories Without Owner Read Permission [Required]

Files and directories need to be configured with at least read permission for the owner (NAND_PERM_OWNER_READ). With Revolution SDK version 2.3 patch 5 and later, a function call to create or change the permission of a file or directory will fail if there is no owner read permission.

## 8.17 Prohibition of Frequent Read Access [Required]

Due to the characteristics of Wii console NAND memory, a Read operation repeated over several hundred thousand times without any Erase or Write operations for a given region may corrupt the data in the block that includes that region. To avoid this problem, first load a set amount of data to MEM1/MEM2, and then access this loaded data when data stored in Wii console NAND memory needs to be read repeatedly.

Specifically, accessing a small region of a few kilobytes at a frequency of approximately every frame or every second is prohibited. For example, pay close attention to programs that perform the following types of operations.

- Read access for every character in a font displayed
- A periodic Read access every frame or every second
- Read access every time a character walks

## 8.18 Save Banner File Creation

Implement the following items so that the appropriate save banner can be displayed for the created save data.

If there is no save banner file in the save data directory, the Wii console's Save Data Management Screen will delete the save data in that directory on the assumption that the data is invalid. This is done so that inconsistencies do not emerge even when invalid files have been created due to events like the power being cut.

If a save banner file is the only thing in the save data directory, copying to an SD Card is not possible from the Wii console's Save Data Management Screen.

## 8.18.1 Timing of Creation [Required]

Save banner files should be created at the very end of the process of creating the minimum required files, from a state in which there are no files in the home directory (for example, at the first application startup).

The reason is to avoid user confusion. If required files were created after the creation of the save banner file, there may be situations where it would appear from the Save Data Management screen as if valid data existed, but the data would be shown to be invalid when the application is restarted, causing user confusion.

Also, if only a save banner file were found in the save data directory, it could not be copied to the SD Card in the Wii console Save Data Management screen. To avoid these problems, the save sequence needs to follow the steps below.

1. Begin in a state in which there are no files in the home directory (for example, at the first application startup).
2. Create the save data/directories.
3. Create the save banner file.
4. Start the application.

When you are creating a new save banner file, first create the file in `/tmp` and then use the `NANDMove` function to move the file to the home directory.

By following this procedure, the only time when it is possible for no save banner file to exist is when the save data file(s) are created for the first time.

If you create the save banner file directly in the Home directory, you risk creating a file of 0 bytes (this might happen, for example, if there was a power outage). As a result, the save banner would not display correctly on the Wii console's Save Data Management screen, and the user would not be able to determine to which application the save data belonged.

## 8.18.2 Check the Save Banner File [Required]

Every time the application starts, check to confirm that the save banner file was created as intended by the application (for example, that it has not been corrupted).

If the save banner file was not created as intended (due to a power failure or some other reason), the Wii console's Data Management screen will not display save data correctly, and the user will not know which save data belongs to which application.

If the save banner file could not be created as intended, use either of the below methods to create the file again.

- Overwrite the file.
- Create the file in `/tmp` and then use the `NANDMove` function to move it to the home directory.

If the save banner file was not present, start again from the beginning to create the save data. Verifying with the user to make the save data again is optional.

## 8.19 Precautions for Creating Save Data [Information]

See the *NAND Library Function Reference Manual* for the methods and precautions for avoiding data loss and corruption at creation of save data.

## 8.20 Save Data Comments [Required]

Always place the game title in the first line of save data comments. A comment of your choice may be placed in the second line.

If the comment does not fit in the second line, the first line may start with the game title and be in the format "game title + any text."

The comments must be set in the Unicode format. A null character (\0) is treated as a termination character, but to prevent extra characters from remaining after the comments, always be sure to fill the remaining area with null characters.

A sans-serif (WBF1) Wii bitmap font is used to display the comments. The usable characters in WBF1 are as follows (all characters other than extended characters).

**Table 8-2 Characters Usable in Save Data Comments (By Region)**

| Region | Japan, North America, Europe, Australia | China | Korea |
|---|---|---|---|
| Alphanumeric characters (Latin characters) | Yes | Yes | Yes |
| Greek characters | Yes | Yes | Yes |
| JIS half-width characters | Yes | | |
| JIS non-ideographs | Yes | | |
| JIS level 1 kanji | Yes | | |
| JIS level 2 kanji | Yes | | |
| Roman numerals | Yes | Yes | Yes |
| Kanji included in GB2312-80 | | Yes | |
| All Hangul (11,172 characters) | | | Yes |

Within the structure, 32 characters worth of area is allocated per line, but the number guaranteed for display is 20 characters. Comments longer than 20 characters might extend past the comment display region on the Wii Menu, so always confirm that they are shown correctly.

## 8.21 Save Data Location Specification [Required]

A save banner file should always be created in the save data directory prepared by the system (`/title/<title-id(Low)>/data`) with the filename `banner.bin`.

An application creates only a single save banner file. Make sure that this is created in the save data directory with the specified file name.

## 8.22 Prohibition of Using Reserved Names [Required]

The names `noerase` and `notransfer` are reserved by the system. Creating a file or a directory in the save data directory with these names is prohibited.

## 8.23 Precautions Regarding the nocopy Directory [Required]

Do not create any data whose loss may critically affect the game progress in the `nocopy` directory.

When such data is placed in the `nocopy` directory, the original data becomes unrecoverable if the user erases the data in Wii console NAND memory assuming that the backup save data is copied to the SD Card.

## 8.24 Save Data Tampering Protection by the Wii Console [Information]

When save data is being copied to the SD Card in the Wii console's Data Management screen, a data tampering protection is applied. In general, there is no need to implement any tampering protection for save data saved to Wii console NAND memory from the application side. However, security is not guaranteed for the future, so data tampering processing can also be implemented by the application in order to ensure better security.

## 8.25 Prohibition of Usage Restrictions on Save Data Due to Wii Console-Specific Information [Required]

Creating save data that uses information unique to each Wii console (for example, MAC addresses) and that can only be used by the Wii console that has that unique information is prohibited.

This is to prevent save data from becoming unusable if a module or the Wii console is replaced during repair.

## 8.26 ~~Support for NAND_RESULT_MAXBLOCKS and NAND_RESULT_MAXFILES [Recommended]~~ [Deleted]

(Deleted as the result of a guideline review.)

## 8.27 ~~[N. American Version Only] Considerations for Save Banners That Do Not Have Alpha Values Applied [Required]~~ [Deleted]

(Deleted because changes to the Wii Menu make it unnecessary.)

## 8.28 Handling NAND_RESULT_UNKNOWN [Required]

Display error message NAND_12 from the *Wii Message List* when the NAND API gives a result code of NAND_RESULT_UNKNOWN. Ignore controller operations, RESET, and the Power Button while the error message is being displayed.

The NAND_RESULT_UNKNOWN value represents an unexpected Revolution SDK error for which application behavior is not guaranteed, so continue to display an error message instead of running reset or shutdown processing.

## 8.29 Sharing Save Data Between Applications

The following items must be supported when sharing save data between applications.

Also, the game codes of the applications sharing the save data must be determined in advance. In particular, be aware that when the applications have different release dates, the game code for application to be released later must be allocated in advance.

Save data can be shared with any of the following combinations.

- Disc application and disc application

- Disc application and NAND application

- NAND application and NAND application

In particular, see section 2.1.3 Restrictions on Wii Console NAND Memory Usage When Sharing Save Data [Required] in the *Wii Programming Guidelines Disc Spin-Off Channels Edition* when sharing save data one-to-one between a disc application and the channel application installed from that disc application.

### 8.29.1 Creating a Directory for Sharing [Required]

Create a directory named share under the home directory to hold the files to be shared.

The permission settings for share can be freely set by the developer. File reading and writing are performed according to the file permission settings.

Be aware of file list acquisition within the directory. If the application does not have the Read rights for the directory, it cannot get the file list due to permission restrictions. Reading and writing of the files is not possible unless the filenames are already known.

### 8.29.2 Prohibition of Changing the File Size or Number of Inodes for Save Data of Other Titles [Required]

Changing the file size or number of inodes for the save data of other titles is prohibited.

This is because each application independently manages the usage limitations of the allocated home directory.

### 8.29.3 Operations Independent of the Start Order of Titles That Share Save Data [Required]

Fatal problems such as malfunctions or stoppage must not occur regardless of the order in which titles sharing the save data are started.

For example, even if Title A is released before Title B, it may be the case that after playing Title B, the user will want to play Title A.

When reading files or directories located in `share` directly under the home directory of another title, be sure that operations continue without a problem regardless of whether the file or directory exists.

### 8.29.4 Handling When the Shared Files Are Deleted [Required]

Users must not be notably disadvantaged even if partially shared files are deleted by another application.

For example, when Title B reads shared files created with Title A, do not require Title B to restart from the beginning even if the save data for Title A is deleted. However, the case when all of the save data for Title A and Title B is shared (when all the data, not just some, is shared) is exempt.

## 8.30 Restriction on Copy Protect Settings [Recommended]

We recommend that copy protect not be set when there is no need to copy-protect save data.

Save data that has been copy-protected cannot be saved to the SD Card, so if the Wii Console NAND memory is filled with copy-protected files, there may be insufficient memory to save the save data of other applications or channels.

Contact Nintendo at support@noa.com if you want to use copy protection.

# 9 Nintendo GameCube Memory Card

Do not use the Nintendo GameCube Memory Card. Also, do not link to the CARD library when creating master data.

Use a version of the *Revolution SDK Version Check Tool* no older than March 27, 2008, to confirm that the CARD library is not linked.

If the CARD library is being used, the string "CARD" appears under the "Other Libraries" section.

The CARD library was removed from Revolution SDK 3.2.

## 9.1 ~~Nintendo GameCube Memory Card Compatible Application [Information]~~ [Deleted]

## 9.2 ~~Use of Write Functions Prohibited [Required]~~ [Deleted]

## 9.3 ~~Programs Must Not Depend on the Access Speed of Nintendo GameCube Memory Cards [Required]~~ [Deleted]

## 9.4 ~~Support for High-Capacity Nintendo GameCube Memory Card [Required]~~ [Deleted]

## 9.5 ~~Errors Displayed when Memory Cards Cannot be Used [Required]~~ [Deleted]

## 9.6 ~~Compatible Slots [Recommended]~~ [Deleted]

## 9.7 ~~Memory Card Menu in Application [Required]~~ [Deleted]

## 9.8 ~~Limit on Accessible Memory Card Files [Required]~~ [Deleted]

# 10 Reset and Shutdown

## 10.1 Wii Console RESET [Required]

If RESET is pressed while an application is running, immediately perform the pre-processing for reset, and perform the reset operation once this pre-processing is complete. Also, do not perform any operation other than a reset when RESET is used.

However, see section 8.7 Handling Reset While Writing [Required] regarding writing to the Wii console save memory.

For details, see the *Wii Console Reset and Shutdown Programming Manual* and the *Revolution Optical Disc Drive Library (DVD)* manual.

## 10.2 Wii Power Button [Required]

If the Power Button on the Wii console or Wii Remote is pressed while an application is running, immediately perform pre-processing for shutdown, and perform the shutdown operation once pre-processing is complete. Also, do not perform any operation other than a shutdown when the Power Button is pressed.

Also, holding the Power Button of the Wii console for approximately 4 seconds will cause the Wii console to turn off by means of a hardware shutdown.

For details, see the *Wii Console Reset and Shutdown Programming Manual* and the *Revolution Optical Disc Drive Library (DVD)* manual.

## 10.3 Resetting the Nintendo GameCube Controller Origin During Reset Operations [Required]

Always perform an origin reset for the Nintendo GameCube Controller when a reset is performed in an application that supports the Nintendo GameCube Controller.

The user may press RESET for a correction when the origin goes out of alignment.

Here, the reset operation refers to the reset operation performed with either RESET on the Wii console or the Reset button on the HOME Menu.

When using the function `OSRestart` for reset, use the function `PADRecalibrate` to reset the origin. If `OSReturnToMenu` is being used to return to the Wii Menu, there is no need to perform an origin reset because the Nintendo GameCube Controller cannot be used to operate the Wii Menu.

The origin for the Nunchuk, Classic Controller, or WaveBird is not reset when the origin reset is performed from the Wii console.

## 10.4 Prohibiting Use of the OSRebootSystem Function [Required]

It is prohibited to use the `OSRebootSystem` function. Call `OSReturnToMenu` or `OSReturnToDataManager` to return from the application and use Wii Menu features.

## 10.5 ~~Required Preparations Before Using the Reset/Shutdown Functions [Required]~~ [Deleted]

(The content of this section was deleted because it was redundant with sections 10.1 Wii Console RESET [Required] and 10.2 Wii Power Button [Required].)

## 10.6 Restrictions on Operations for Resets [Required]

Be sure to perform a reset only when RESET on the Wii console is pressed or when the reset option is selected using the HOME Menu.

# 11 HOME Menu

## 11.1 Implementing the HOME Menu and Using the HBM Library [Required]

You must implement the HOME Menu for all applications.

In addition, you must use the HOME Menu library (the HBM library) to incorporate the HOME Menu into your applications.

In principle, the modification of the HBM library and its accompanying data (screen layouts, images, sounds, and so on) is prohibited.

However, the display and the behavior of the HOME Menu do not have to be exactly like that of the Wii Menu's HOME Menu, providing the changes do not interfere with its operation as a HOME menu.

As long as the user can operate the HOME Menu accurately, it is acceptable if a portion of the buttons or characters extend past the television screen or if, conversely, the screen of a background application can be seen behind the edge of the HOME Menu.

## 11.2 HOME Menu Display Triggers [Required]

Only display the HOME Menu immediately after HOME is pressed. Do not display it under any other circumstances. Do not display a confirmation message such as "Do you want to go to the HOME Menu?"

## 11.3 Display Language for the HOME Menu [Required]

The language selected in the system settings should be used as the HOME Menu language, regardless of the language used in the application.

For example, if the application is for the North American market and uses only English, but French is selected in the system settings, display the HOME Menu in French.

A list of language options for each market is shown in Table 11-1.

**Table 11-1 Selectable Languages for Each Market**

| Market | Language Selection |
|---|---|
| Japan | Japanese |
| North America | English, French, Spanish |
| Europe/Australia | English, French, Spanish, German, Italian, Dutch |
| China | Chinese |
| Korean | Korean |

## 11.4 Aspect Ratio of the HOME Menu [Required]

If the application supports the 16:9 aspect ratio, the aspect ratio of the HOME Menu should also follow the setting of the Wii system.

For details, see section 6.16 Settings and Display for Applications That Support the 16:9 Aspect Ratio Display [Required].

## 11.5 ~~Using the HOME Menu from All Paired Wii Remotes~~ ~~[Recommended]~~ [Deleted]

(Deleted in accordance with guideline revisions.)

## 11.6 Support for HOME Menu by Classic Controllers [Required]

Applications supporting Classic Controllers should support the following.

- Display the HOME Menu when HOME on either the Classic Controller or the Wii Remote is pressed.
- Allow control in the HOME Menu from both the Classic Controller and the Wii Remote.

## 11.7 Application Processing During HOME Menu Display [Recommended]

Because the user cannot perform any application-related operations while the HOME Menu is displayed, be sure to consider the issue of timing when displaying the HOME Menu so that it does not inconvenience the user.

For example, in the case of an action game, make sure that the game does not continue while the HOME Menu is displayed, resulting in damage from an opponent or loss of remaining time.

## 11.8 Restrictions on Rumble Feature

### 11.8.1 Restrictions Due to the Rumble Setting of the HOME Menu [Required]

If the application has its own controller Rumble Feature option setting, and the Rumble setting in the Wii Remote Settings screen of the HOME Menu is set to Off, the controller's Rumble Feature should not be activated regardless of the application's own option setting.

The Rumble Feature for the controller should only be used if the Rumble setting in the Wii Remote Settings screen of the HOME Menu is set to On (for example, if the return value of the `WPADIsMotorEnabled` function is `TRUE`).

### 11.8.2 Prohibition of Changing the Rumble Setting of the HOME Menu [Required]

Changing the Rumble setting of the Wii Remote Settings screen in the HOME Menu from the application is prohibited.

If the Rumble setting of the Wii Remote Settings screen in the HOME Menu is set to Off (for example, if the return value of the `WPADIsMotorEnabled` function is `FALSE`), running the `WPADMotorEnable(TRUE)` function and then calling `WPADSaveConfig` changes the Rumble setting of the Wii Remote Settings screen in the HOME Menu to On. Do not use the `WPADEnableMotor` and `WPADSaveConfig` functions in Master ROM versions. They may only be used for debug.

## 11.9 Speaker Initialization After Leaving the HOME Menu [Required]

After returning from the HOME Menu to the application, the state of the Wii Remote speaker is undefined. Always be sure to initialize the speakers after returning to the application.

## 11.10 Prohibition of Using the Wii Remote Speaker During HOME Menu Startup [Required]

While the HOME Menu is starting up, the application must not operate the Wii Remote speaker.

## 11.11 Display of the HOME Menu Disabled Icon [Recommended]

If the HOME Menu cannot be displayed, display the specified HOME Menu Disabled Icon when possible when HOME is pressed.

There is no need to display the HOME Menu Disabled Icon when the Strap Usage screen is being displayed, a fatal error has occurred, or when a user would not feel anything is wrong even if the Wii Remote input has no effect. (If you are displaying the icon on the Strap Usage screen, see the Wii Strap Reminder package at http://www.warioworld.com.)

Follow the instructions under "Icon Displays" in the *HOME Menu Library* Function Reference as closely as possible for fade-ins, fixed display time, and fade-outs for the HOME Menu Disabled Icon.

## 11.12 Processing When Quitting the HOME Menu [Required]

When returning from the HOME Menu to the application, get the button pressed when quitting the HOME Menu using `HBMGetSelectBtnNum`. When the button is either Wii Menu or Reset, perform the corresponding process immediately.

After returning to the application upon selection of the Wii Menu button or Reset button, do not display a verification message (such as "Would you like to Quit?"). Also, do not restore the volume of the application (leave it on mute).

## 11.13 Sound Volume When Entering and Exiting the HOME Menu [Required]

When entering the HOME Menu, set the sound volume to 0 on the application side. When exiting the HOME Menu, initialize sound effects on the application side when the HOME Menu ends, and restore the sound volume.

## 11.14 Displaying Error Messages for Errors That Occurred While in the HOME Menu [Information]

If the generation of an error is detected while displaying the HOME Menu, it is acceptable to display an error message immediately after returning to the application from the HOME Menu.

For example, if the HOME Menu is displayed and the disc is ejected while data is being read from the disc, you can display a "No disc" error message as soon as the process returns to the application.

However, if an error occurs that might make even rebooting the Wii console impossible (such as a fatal error regarding the disc drive or `NAND_RESULT_CORRUPT` regarding Wii console NAND Memory), display the error message in the HOME Menu.

## 11.15 Displaying Messages Suited to Save Data Confirmation [Required]

Two types of messages have been prepared to be displayed when **Wii Menu** or **Reset** is pressed on the HOME Menu: One includes a warning that unsaved data will be lost, and the other does not. Standardize the message displayed by your application to suit its specifications.

Usually, the message that includes a warning should be used by applications with a save feature, and the message that does not include a warning should be used by applications that either do not have a save feature or do not require user input when saving (such as applications with an auto-save feature).

# 12 Icons and Banners

## 12.1 Icon Animation [Required]

To make the Wii Menu resemble a television channel interface, always use an animation for the Wii Menu channel list icon so that it will not be a stationary image.

Animation is not required to play in the Channel Data Management screen, even within the Wii Menu. See section 12.11.4 Layout Specifications Before Channel Script Execution [Required].

## 12.2 Use of Text Boxes for Icon Layout [Required]

If using text boxes for the icon layout, be sure to use the Wii bitmap fonts included in Revolution SDK (`wbf1.brfna` and/or `wbf2.brfna`, under `RVL_SDK\dvddata\fonts`).

The use of any other fonts is prohibited.

Separate Wii bitmap fonts have been prepared for Chinese and Korean versions.

## 12.3 Icon and Banner Data Size Restriction [Required]

The data size for icons and banners must be 512 KB or less after being compressed with the archiving tools. Icon resources, banner resources, and banner sound data will be compressed and stored into banner data.

## 12.4 Title Display in the Banner [Required]

Always display the software title name in the banner.

The title name can be displayed as a texture or through a text box, and the display size may be set freely. The title name does not need to be displayed at all times, and may become hidden as a part of the presentation.

We recommend using the language set in the Wii system language setting for the title name display.

For details on languages used in banners, see section 3.5 Switching Languages in the *Icon and Banner Specification.*

## 12.5 Banner Animation [Information]

Animation is not required for the banner displayed when a Wii Menu channel is selected. Still images are acceptable.

## 12.6 Use of Text Boxes for Banner Layout [Required]

If using text boxes for the banner layout, make sure to use the Wii bitmap fonts included in Revolution SDK (`wbf1.brfna` and/or `wbf2.brfna`, under `RVL_SDK\dvddata\fonts`).

The use of any other fonts is prohibited.

Separate Wii bitmap fonts have been prepared for Chinese and Korean versions.

## 12.7 Display of Trademarked or Copyrighted Names in the Banner [Information]

The Channel banner displayed in the Channel Preview screen may include trademarked or copyrighted names, such as company logos. Doing so can shorten the user wait time by removing the necessity of trademarked displays in the application startup sequence.

For reference, titles developed by Nintendo display their copyrights in the application title screen, but trademarks are generally displayed in the banner to shorten the transition time to the application title screen.

A minimum of 1 second is guaranteed from the completion of icon selection screen zoom effect (or transition effect from the neighboring banner) to the start of the application title screen transition fadeout. Ensure that if the copyright/trademark display is presented here, the information is not faded in and then out because it could be skipped if Parental Controls are activated.

However, the above suggestion is optional, so the trademark or copyright information may still be displayed in the application startup sequence or title screen as traditionally done. Determine the display method based on company policy or what is appropriate for the application.

Trademark or copyright information may also be displayed in both the banner and the startup sequence/title screen. If implemented, make sure the content displayed in the banner and screen stays consistent.

## 12.8 [N. American Version Only] Consideration for Non-Application of the Banner Alpha Value [Required] [Deleted]

(This describes save banners, so the content was moved to Chapter 8 Wii Console NAND Memory.)

## 12.9 Banner Sound Setting [Required]

To make the Wii Menu resemble a television channel interface, always set a banner sound to ensure that the screen is not silent during the banner display.

## 12.10  Displaying the Title in the Banner Data Header [Required]

In the banner data header, do not specify an arbitrary string that is irrelevant to the title of the application.

In the first row of the banner data header, enter a title that basically suggests the application name. It does not need to be exactly the same as the actual title of the application. In the second row, specify something like a subtitle.

Note that the banner data header will be referenced by "Today's Accomplishments" in the Wii Message Board.

# 12.11  Channel Scripts

Applications that support Channel Scripts should also support the following items.

### 12.11.1 Processing Time Restrictions [Required]

Do not spend more than 1 second processing a Channel Script used by icons and banners.

If Channel Script processing takes a long time, Wii Menu behavior might be delayed while waiting for it to end, such as when going from one Wii Menu screen to another.

Set a maximum processing time of 1 second or less for scripts with processing times that vary depending on such conditions as the state of the save data.

If the processing time is 2 seconds or more, the Wii console will enter an infinite loop if **Begin** is selected on the Channel Banner screen in version 3.1 of the Wii Menu.

### 12.11.2 Prohibition Against Heavy Processing After the System.beginRender Method Has Been Called [Required]

Perform heavy processing such as loading files before calling the `System.beginRender` method. Such processing will stop the Wii Menu from rendering.

In Channel Scripts, threads with a lower priority than the main thread are processed first. The main thread is processed after the `System.beginRender` method is called. This prioritization allows heavy processing (such as loading files from Wii console NAND memory) to be performed in separate threads, and light processing (such as layout controls) to be performed in the main thread.

If texture contents are rewritten, layout coordinates are changed, or other processing that affects rendering is performed after the `System.beginRender` method is called, there is a danger that operations in other threads may overlap with rendering in the main thread.

### 12.11.3 Avoiding Rendering Gaps Due to Icon Layout Adjustment [Required]

When controlling icon layout using a Channel Script, make adjustments to the layout to prevent processing from slowing considerably while rendering in the Wii Menu.

All icons displayed on the Wii Menu screen are rendered (including off-screen icons while scrolling). Consequently, if the burden of rendering each icon gets larger, it might cause processing as a whole to slow down.

For example, be careful when displaying strings. Processing will slow when importing multiple channel applications created with an icon layout that displays a large number of characters in a text box pane.

The Channel Script Package includes the means to import and test 47 copies of the same application (all available channels). Confirm that processing does not slow down even within that state,

## 12.11.4 Layout Specifications Before Channel Script Execution [Required]

When using Channel Scripts to control icon layout, design icons to be free of problems even before a script is run.

The Wii Menu can process multiple icon scripts in succession. As a result, an icon's script might not always run immediately, and its layout might be displayed before being manipulated.

The unmodified icon layout will also be displayed on the Channel Data Selection screen in that same Wii Menu because scripts will not be run there.

For example, items might be displayed as follows.

- The phrase "This is dummy text" will be displayed unchanged if it is inserted as the default value in a text box.

- If an icon changes the coordinates at which the structural elements of its layout are placed and the initial position for all of these elements is set to the same set of coordinates (such as the upper-left corner of the screen), the elements will all be placed on top of each other.

Even though icons in the Wii Menu's Channel List must be configured with an animation, animation can be ended because scripts are not run on the Channel Data Selection screen. See section 12.1 Icon Animation [Required].

# 13 Communications with Nintendo DS

The following features must be supported in applications that communicate with the Nintendo DS system (hereafter, "the DS").

In addition, DS applications must comply with the *Nintendo DS Programming Guidelines.*

## 13.1 General

### 13.1.1 Adherence to the Use of the Library [Required]

When communicating with the DS, be sure to use the libraries provided by Nintendo.

### 13.1.2 ON and OFF State of MP Communications [Information]

The ON state of MP Communications refers to the state in which wireless signals can be sent or received, or the state in which wireless signals are actually being sent or received for the purpose of wireless communications with the DS. To be specific, this state amounts to the period between the execution of the `MPStartup` or `MPDLStartup` function and the `MPCleanup` or `MPDLCleanup` function. (MP Communications will be in the OFF state during all other intervals.)

This is different from the situation with the DS in that MP Communications can be turned ON without the user's permission and with arbitrary timing, and there is no problem with turning them ON automatically immediately after application startup.

### 13.1.3 Downloading Programs [Required]

Sending programs (native ARM code) to the DS and running them through means other than the MPDL and MPFS libraries is prohibited.

### 13.1.4 Using GGIDs [Required]

Use only the GGID that is set by Nintendo for each game title. (Do not use a number that has not been assigned by Nintendo.)

You can, however, use a private GGID during testing and the early stages of game development. Private GGIDs have been allocated for testing and will not be set for individual game titles. Note that connections may therefore be established by other test applications that use the same private GGIDs, which may cause bugs to occur.

There are 256 private GGIDs ranging from `0x003FFF00` to `0x003FFFFF`.

### 13.1.5 Using TGIDs [Required]

Set the TGID to a different value each time communication is started with a DS so that old connections will not connect by mistake.

Specifically, setting the `tgid` member variable to `MP_TGID_AUTO` in the `MPConfig` (for MP communications) or `MPDLConfig` (for MPDL communications) structure will cause a different value to be automatically set every time.

## 13.1.6 Development Note for Regional Restrictions [Information]

When developing applications that allow communications between DS and Wii applications, be careful about the region information (game code) of the application of the peer in the communications.

Because Nintendo DS systems do not use the system region as a means of restricting which software can be run, business decisions may sometimes dictate that applications with different regions than the Wii console being sold in the same market may be sold in a given market.

For example, European-region Nintendo DS systems are sold in Australia, and typically the European-region version of a given Nintendo DS title is sold in Australia. However, there may be cases in which the North American version of a Nintendo DS title is sold in Australia.

If you fail to take this into account and implement communication functionality that can communicate with only Nintendo DS software for the same region, communication between DS and Wii applications may not be possible in certain markets.

# 13.2 MP Communications with the DS

## 13.2.1 Message Display for Severed Connections [Required]

When a severed connection makes it difficult to continue the game, display a warning message such as "Communication Error" when the severed connection is detected.

For example, if the connection is severed for only one of several connected DS systems, a warning message must be displayed on the DS with the severed connection. But if there is no overall effect on the application's use by other players, no warning messages need be displayed to other DS systems or Wii consoles that are still connected.

If there is a special reason for not wanting to notify the user of a severed connection (or that MP Communications associated with the severed connection were carried out), there are special cases in which hiding messages (or falsely displaying them) is allowed.

If you have such plans, contact support@noa.com before proceeding.

## 13.2.2 Single-Transmission Data Size for MP Communications [Recommended]

We recommend that the total transmission time for a single transmission of MP Communications between the parent and all children should be 5600 microseconds or less.

**Note:**  The shorter the transmission time, the better the communication performance is. However, there are various disadvantages if the data size is large, including being unable to establish a wireless connection, decreased reliability of data transmission, decreased number of systems which are simultaneously transmitting in the same area, increased power consumption, decreased resistance to interference, and so on.

To calculate the total transmission time, use the "Wireless Communication Time Calculation Sheet" in the *Figures and information* page in the Wireless Manager (WM) section of the *NITRO-SDK Function Reference Manual* distributed with the DS development environment (NITRO-SDK).

A sample calculation is shown below.

In the case of MP Communications, once every 60 seconds for communication between one Wii console and 15 DS systems:

- Wii: 128 bytes or less
- DS: 16 bytes or less

## ~~13.2.3 Which GGID to Use [Required]~~ [Deleted]

(This section is also related to DS Download Play, so it has been renumbered to 13.1.4 and moved to section 13.1 General.)

## 13.2.4 Connection with Game Software of Other Companies' Titles Is Prohibited [Required]

Creating game software that can connect with game titles made by other companies is prohibited.

If you have such plans, contact support@noa.com before proceeding.

## 13.2.5 Connection with Different Versions of the Same Software [Required]

Make sure that communications with different versions of DS software of the same title can be carried out normally.

## 13.2.6 Processing When Attempting to Connect More than the Supported Number of DS Systems [Required]

Make sure that communications can function normally for the supported number of DS systems, even if more than the supported number of DS systems attempt to connect to a single Wii console.

## 13.2.7 Screen Burn-In Reduction Feature [Required]

For applications that use the DS as a Wii controller and do not concurrently use the Wii Remote, the screen burn-in reduction feature might be activated when the user does not expect it.

Consequently, reset the counter for activating screen burn-in reduction (using the `VIResetDimmingCount` function) every time there is active input from the user (button or touch panel input, valid speech input to the microphone, and so on).

Resetting the screen burn-in activation counter under any other circumstances (that is, when there is no active input from the user to the DS system that has become an input device) is prohibited.

For details on the screen burn-in reduction feature, see section 6.21 Applying Screen Burn-In Reduction Setting [Required].

## 13.2.8 Dealing with Invalid or Corrupted Communications Data [Required]

Because there is a chance that data sent from DS systems will be invalid or corrupted, always code with that in mind. See the specific guidelines indicated in the following subsections.

### 13.2.8.1  Caution About Buffer Overflows

In order to prevent the system from being taken over through the exploitation of buffer overflows, avoid using variable-length data and always execute sends and receives using fixed-length data.

For example, avoid things like acquiring and using the data size from the header portion of received data.

### 13.2.8.2  Validity Check for Received Data

Be absolutely sure to check that each parameter of the received data falls within the expected range.

# 13.3 DS Download Play

## 13.3.1 ~~Banner Icons [Information]~~ [Deleted]

(Deleted because starting with Revolution SDK Extensions 2.1, Wii games can specify their own individual icons for DS Download Play.)

## 13.3.2 ~~TGIDs Used by the MPDL Library [Required]~~ [Deleted]

(This section is also related to MP communications with the DS, so its content has been updated, moved to section 13.1 General, and renamed section 13.1.5 Using TGIDs [Required].)

## 13.3.3 Accessing Cards During DS Download Play [Required]

Allowing programs transferred to a DS via DS Download Play so as to access DS Game Cards made by other companies is prohibited as a rule.

Do not access memory areas other than the backup memory, even for DS Game Cards made by your company. If you have plans that involve accessing memory areas other than the backup memory, contact support@noa.com before proceeding.

## 13.3.4 Characters Displayed on the DS [Required]

Restrict the strings passed to the `MPDLConfig` structure to characters that can be displayed on the DS. These strings are the publisher name, program title name, and program description displayed on the DS Download Play client.

For details about the characters that can be displayed on the DS, see the character code chart in the *DS IPL Banner Guidelines* package.

# 14 USB Keyboards

Applications that support USB keyboards (hereafter, keyboards) connected to the USB connector must support the following items.

## 14.1 Operation Verification on Specified Models

Be sure to verify operations on Logitech's Classic Keyboard 200 (regardless of the keyboard color) for the following items.

Nintendo has verified operations on the following models.

- Logitech's Classic Keyboard 200
- Logitech's Cordless Keyboard for Wii

Although it is required to verify operation on the Classic Keyboard 200, we recommend that you verify on both models.

For key arrangements of each model, see the *KBD Library Supplemental Manual*.

### 14.1.1 Support for Different Model Numbers According to Market and Language [Required]

The keyboards for which operations have been verified have different model numbers according to the market and language, so support these when localizing. Specifically, be aware of the language-specific keys such as the half-width/full-width key in the Japanese keyboard or dead keys in the European keyboard.

For key arrangements by language, see the *KBD Library Supplemental Manual*.

### 14.1.2 Operation of Unused Keys [Required]

Ensure no problems occur in the application due to an unused or unexpected key being pressed. Be sure to appropriately support all expected and used keys and key combinations, and ignore unused keys.

### 14.1.3 LED Status Control [Required]

Be sure to control the keyboard LEDs with the application. Implement the NUM LOCK and CAPS LOCK keys so the user can operate them just as on the PC keyboard. SCROLL LOCK key support is optional. The sample demo in the KBD library introduces how to control the LEDs appropriately.

Excessively changing the LEDs may affect the USB operation performance. Limit sending LED commands to only instances when the NUM LOCK, CAPS LOCK, or SCROLL LOCK keys are pressed.

### 14.1.4 Handling Different Types of Keyboards [Required]

Do not have application designs that operate only with a specific type of keyboard.

For example, the PRINT SCREEN key and INSERT key are available on the Classic Keyboard 200 but not on the Cordless Keyboard for Wii. Do not design a game to require these keys for progress or operations in the game.

In addition, the Cordless Keyboard for Wii does not have a NUM LOCK key, so the NUM LOCK status must be initialized when the keyboard is connected.

For key layout and key codes for special keys, see the *KBD Library Supplemental Manual* .

## 14.2 Avoiding Game Design Forcing Extended Continuous Operation or Strenuous Activity [Information]

For keyboards, as with controllers, please avoid game designs that force extended continuous operation or strenuous activity.

For controllers, see section 7.1.2 Avoiding Game Design Forcing Extended Continuous Operation or Strenuous Activity [Information].

## 14.3 Prohibit Hot Swapping of the Keyboard [Required]

Do not have specifications that urge the user to hot swap while the application is running. This is to control wear of the connectors and to prevent damage to the Wii console due to hot swapping.

## 14.4 Processing During Startup When a Keyboard Is Required [Required]

For applications that require a keyboard, if a keyboard is not connected during startup, display USBK_01 from the *Wii Message List* and shut down after waiting for user operation.

## 14.5 Operation When a Non-Supported USB Device Is Connected [Required]

Do not allow malfunctions when a USB device not supported by the application is hot-swapped. There are cases when the user connects a USB device not supported by the application or the device is already connected at startup. For USB keyboards, be especially careful of devices such as USB mice or USB number pads, which are in the same HID class as USB keyboards.

# 15 Wii Balance Board Accessory

Applications that support the Wii Balance Board should conform with the sections of this chapter. The Wii Balance Board is not currently sold individually, so including specifications that require the use of the Wii Balance Board is prohibited.

Contact Nintendo in advance if you must require the use of the Wii Balance Board.

## 15.1 Disconnecting the Wii Remote Controller [Information]

Disconnect the Wii Remote from 4P before connecting the Wii Balance Board accessory. If this is not done, the Wii Balance Board accessory cannot be connected.

## 15.2 Load Restrictions [Required]

To discourage users who weigh more than 150 kg (330 lbs.) from using the Wii Balance Board accessory, display message WBCM_01 from the *Wii Message List* when the measured load exceeds 150 kg (330 lbs.), and do not proceed until receiving confirmation that the load is 150 kg (330 lbs.) or less.

Perform the accurate load measurement process to determine whether the weight restriction has been exceeded. Do this regardless of whether accurate loads are being used in other parts of the application.

The Wii Balance Board accessory is designed for a maximum load of 300 kg (661 lbs.). The 150kg restriction is in place because it is conceivable that a user weighing more than 150 kg (330 lbs.) might apply a load that exceeds this value. It is not a problem if the user takes some action that momentarily increases the load above 150 kg on the Wii Balance Board accessory.

For information on accurate load measurement, see sections 0 If you want to determine when a user has stepped on and then off the Wii Balance Board accessory in a simple operation (for example, to measure body weight), make your determination based on whether the load on the accessory has changed by more than 2kg after performing a zero point calibration with no load.

Do not change this 2kg threshold. If the threshold is changed to be dependent on the user's body weight for the determination, it might not be possible to make correct determinations for lighter individuals.

When the game control requires more than simple stepping on/off, (for example, when the user shifts body weight to operate an application), use an appropriate determination method according to the specifications of your application.

It is also acceptable to use input from the user to determine stepping on and off the device.

Preparations for Accurate Load Measurement [Required], 15.7 Specification of the Process and Time Required for Accurate Load Measurement [Required], and 15.8 Time Restrictions for Accurate Load Measurement [Required].

## 15.3 Operation Restrictions [Required]

To ensure safety, do not ask users to perform the following types of actions on the Wii Balance Board accessory.

- Jumping

- Standing on the edge of the Wii Balance Board accessory

- Stepping onto the accessory with other people at the same time

- Stepping on and off the accessory at such a fast tempo that a user might slip off

- Pressing down forcefully on the accessory with a heel or other hard part of the body

## 15.4 User Warnings [Recommended]

If you are concerned that users may perform any dangerous actions, implement special safety measures. For example, in a game where users may unconsciously be inclined to jump, you may display a message in advance to the effect that jumping is not permitted, handle an excessive drop in the load as a jump and stop the game, or take a similar action.

## 15.5 Using Load to Determine Simple Stepping On/Off Board [Required]

If you want to determine when a user has stepped on and then off the Wii Balance Board accessory in a simple operation (for example, to measure body weight), make your determination based on whether the load on the accessory has changed by more than 2kg after performing a zero point calibration with no load.

Do not change this 2kg threshold. If the threshold is changed to be dependent on the user's body weight for the determination, it might not be possible to make correct determinations for lighter individuals.

When the game control requires more than simple stepping on/off, (for example, when the user shifts body weight to operate an application), use an appropriate determination method according to the specifications of your application.

It is also acceptable to use input from the user to determine stepping on and off the device.

## 15.6 Preparations for Accurate Load Measurement [Required]

To take an accurate load measurement for displaying the weight, checking for the load restriction, etc., always display a message prompting the user to step off the Wii Balance Board accessory immediately before making the measurement

Next, perform the following steps.

1. Call the `WBCRead` function to confirm that the user has stepped off the Wii Balance Board accessory.

2. Set the zero point and execute the temperature update command, which will be needed to correct the weight value.

3. Display a message that prompts the user to step onto the Wii Balance Board accessory.

For more details, see the *Revolution Function Reference Manual*.

See section 15.5 Using Load to Determine Simple Stepping On/Off Board [Required] for more information about determining when the user has stepped on and off the device.

## 15.7 Specification of the Process and Time Required for Accurate Load Measurement [Required]

To take an accurate load measurement for displaying the weight, checking for the load restriction, etc., allow 2 seconds for setting the zero point and 2 seconds for load measurement. An accurate measurement is guaranteed by taking the average value over 2 seconds.

## 15.8 Time Restrictions for Accurate Load Measurement [Required]

To take an accurate load measurement for displaying the weight, checking for the load restriction, etc., prompt the user to take the measurement within 10 seconds of the zero-point setting that immediately precedes it.

If 10 seconds have passed, either cancel the measurement or repeat the process.

## 15.9 Handling Insufficient Remaining Battery Power [Required]

When the remaining battery power obtained with the WBCGetBatteryLevel function is 0, prompt the user to replace the batteries.

Specifically, display message WBCM_02 from the *Wii Message List* and prompt the user to replace the batteries. Unless there is some operation available to substitute for the Wii Balance Board accessory, do not continue until the user has replaced the batteries.

Check the remaining battery power during each frame. To explain, when the remaining battery power obtained by the WBCGetBatteryLevel function becomes 0, the WPADRead function will always return 0 for press, and Wii Balance Board operations will become impossible.

## 15.10 Wii Balance Board Operation Confirmation [Required]

Implement an operation confirmation process for the Wii Balance Board accessory to allow the user to confirm that the Wii Balance Board accessory is operating properly. The Wii Balance Board operation confirmation process will confirm that each of the four Wii Balance Board balance sensors can get measurement values. If even one measurement value cannot be obtained, conclude that the Wii Balance Board is not operating properly. For details, see the *Wii Balance Board Accessory Programming Manual*.

## 15.11 [Japan Only] Sharing HOME Registration Data [Required]

Call the WPADRegisterBLCWorkarea function before the WPADInit or KPADInit function to share Wii Balance Board registration data between applications that support this data.

See the *Wii Balance Board Accessory Programming Manual* for details.

# 15.12  [Japan Only] Compliance with the Weights and Measures Law [Required]

## 15.12.1 Display Based on Guaranteed Accuracy

It is prohibited to display load values on the screen that have a greater degree of accuracy than indicated in the "Weight Display" specification of *Wii Balance Board Accessory Operations Manual*.

The units that can be used in the display vary according to the load, as described below.

**Table 15-1 Allowable Display Units**

| Load | Units |
|---|---|
| 0–100 kg (0-220 lbs.) | 500 g (1 lb.) |
| 100–136 kg (220-300 lbs.) | 1 kg (2 lbs.) |

For example, it is not permitted to display 62.1 kg (136.9 lbs.).

However, just as for a scale with an analog display, it is acceptable to use a scale with tick marks every 500 g (1 lb.) for loads up to 100 kg (220 lbs.) and to show the load by indicating a level in between two tick marks.

## 15.12.2 Weight Display Restrictions

In games intended for the Japanese market, do not display the weight when a load that exceeds 136 kg (300 lbs.) is applied.

# Appendix A Revision History of Previous Versions

| Version | Revision Date | Item(s) Affected | Description |
|---------|--------------|------------------|-------------|
| 1.13 | 2009/05/28 | All | (Japanese version only) Standardized the terminology to "Revolution SDK," with a space between the two words. |
| | | 7.1.18 | Handling of the Wii Remote Jacket [Required]:<br>(Japanese version only) Updated the headers and footers of the landscape page and the pages before and after it. |
| | | 7.1.18.1 | Wii Remote Jacket Usage Table for General Applications:<br>Explained why developers should contact support@noa.com regarding the screen and image to display to confirm that the Wii Remote Jacket has been attached. |
| | | 7.2.28 | Handling Wii Remote Acceleration Noise [Required]:<br>Added this section. |
| | | 8.18 | Save Banner File Creation:<br>Moved to this section the part about the Save Data Management Screen that previously was in section 8.18.1 Timing of Creation [Required].<br>Noted that data cannot be copied to SD Card when only a save banner file is in the save data directory. |
| | | 8.18.1 | Timing of Creation [Required]:<br>Moved the part about the Save Data Management Screen to 8.18 Save Banner File Creation.<br>(Japanese version only) Corrected terminology to read Save Data Management Screen in places where it was written as "Save Data Screen."<br>Added instructions for creating a new save banner file. |
| | | 8.18.2 | Check the Save Banner File [Required]:<br>Clarified processes to take when the save banner file was not created as intended or the file did not exist. |
| | | 8.29.3 | Operations Independent of the Start Order of Titles That Share Save Data [Required]:<br>(Japanese version only) Standardized terminology to denote directory name, changing "/share" to read "share." |
| | | 11.1 | Implementing the HOME Menu and Using the HBM Library [Required]:<br>Changed the title of this section from "Using the Home Menu Library" to "Implementing the HOME Menu and Using the HBM Library."<br>Clarified that all applications must implement a HOME Menu.<br>Added a comment about the display and behavior of the HOME Menu. |
| | | 13.1.6 | Development Note for Regional Restrictions [Information]:<br>Added this section. |
| | | 14 | USB Keyboards:<br>Updated reference to the *KBD Library Supplemental Manual* since it has now been released. |

| Version | Revision Date | Item(s) Affected | Description |
|---|---|---|---|
| | | 15.1 | Disconnecting the Wii Remote Controller [Information]:<br><br>Changed the importance ranking from [Required] to [Information]. |
| | | 15.2 | Load Restrictions [Required]:<br><br>Clarified that for the determination of the load restriction, the accurate load measurement process must be performed regardless of whether accurate loads are used in other parts of the application.<br><br>Noted that it is not a problem for the Wii Balance Board accessory if the user takes some action that momentarily increases the load above 150kg. |
| | | 15.3 | Operation Restrictions [Required]:<br><br>Added as an operating restriction "Pressing down forcefully on the device with a heel or other hard part of the body."<br><br>Standardized the wordings in the bullet points. |
| | | 15.5 | Using Load to Determine Simple Stepping On/Off Board [Required]:<br><br>Changed the title from "Stepping On and Off" to "Simple Stepping On/Off."<br><br>Limited the scope to the cases of simple stepping on/off the Wii Balance Board accessory. Added that the zero-setting must be done first and the reason for the 2kg threshold. |
| | | 15.6 | Preparations for Accurate Load Measurement [Required]:<br><br>Added the checking of the load restriction as an example of performing the Accurate Load Measurement process.<br><br>Added a reference to 15.5 to read about determining when the user has stepped on and off the device. |
| | | 15.7 | Specification of the Process and Time Required for Accurate Load Measurement [Required]:<br><br>Added the checking of the load restriction as an example of performing the Accurate Load Measurement process. |
| | | 15.8 | Time Restrictions for Accurate Load Measurement [Required]:<br><br>Added the checking of the load restriction as an example of performing the Accurate Load Measurement process. |
| | | 15.9 | Handling Insufficient Remaining Battery Power [Required]:<br><br>Updated the content to take into consideration the possibility of some operation to be done in substitute for the Wii Balance Board. |
| | | 15.10 | Wii Balance Board Operation Confirmation [Required]:<br><br>Updated the Wii Balance Board accessory "sensor" to read "balance sensor." |
| | | 15.12.1 | Display Based on Guaranteed Accuracy:<br><br>Standardized the numbering for Table 15 1 Allowable Display Units. Previously it was shown as "Table 2." (Japanese version only) |
| 1.12 | 2009/04/01 | All | Standardized notation.<br><br>Changed the term "DS Single-Card Play" to "DS Download Play." |

| Version | Revision Date | Item(s) Affected | Description |
|---|---|---|---|
| | | Revision History | Added a link to Revision History of Previous Versions. |
| | | 7.1.16 | Processing Hot Swapping of Unsupported Extension Controllers [Required]: <br><br> Changed "extension controllers that are not supported" to "unsupported extension controllers" in the title and text (Japanese version only). <br><br> Although there have been many reports of problems especially during connection, the special mention of connection was deleted so that a caution for both connecting and disconnecting is given. <br><br> The processing while an unsupported extension controller is connected was rewritten in bullet form. <br><br> Content regarding notification for unsupported extension controllers was moved to section 7.1.16.1 User Notification Regarding Hot Swapping of Unsupported Extension Controllers [Recommended]. |
| | | 7.1.16.1 | User Notification Regarding Hot Swapping of Unsupported Extension Controllers [Recommended]: <br><br> The content in 7.1.16 Processing Hot Swapping of Unsupported Extension Controllers [Required] related to notification was moved to this new item. |
| | | 7.4 | Wii Zapper: <br> Updated the reference to the released *Wii Controller Overview*. |
| | | 8 | Wii Console NAND Memory: <br> Added the following sections. <br> • 8.29 Sharing Save Data Between Applications <br> • 8.29.1 Creating a Directory for Sharing [Required] <br> • 8.29.2 Prohibition of Changing the File Size of Number of Inodes for Save Data of Other Titles [Required] <br> • 8.29.3 Operations Independent of the Start Order of Titles That Share Save Data [Required] <br> • 8.29.4 Handling When the Shared Files Are Deleted [Required] <br> • 8.30 Restriction on Copy Protect Settings [Recommended] |
| | | 14.1 | Operation Verification on Specified Models: <br><br> Added content regarding the Cordless Keyboard for Wii, and also revised instructions regarding the Classic Keyboard 200. <br><br> Added to refer to *USB Keyboard Library Supplemental Manual* regarding the key layout. |
| | | 14.1.1 | Support for Different Model Numbers According to Market and Language [Required]: <br><br> Made revisions based on the content added regarding the Cordless Keyboard for Wii. <br><br> Added mention to give additional attention to language-specific keys. <br><br> Changed the reference to *USB Keyboard Library Supplemental Manual*. |
| | | 14.1.4 | Handling Different Types of Keyboards [Required]: <br> Added this section. |

| Version | Revision Date | Item(s) Affected | Description |
|---------|---------------|------------------|-------------|
|         |               | 14.5 | Operation When a Non-Supported USB Device Is Connected [Required]: <br> Added this section. |
|         |               | 15 | Wii Balance Board Accessory: <br> Prohibited including specifications that require the use of the Wii Balance Board, and made revisions to contact Nintendo in advance if there is no way to avoid requiring use. |
|         |               | 15.2 | Load Restrictions [Required]: <br> Revised to perform an accurate load measurement for the load restriction. <br> Added references for accurate loads. |
|         |               | 15.7 | Specification of the Process and Time Required for Accurate Load Measurement [Required]: <br> Changed the title from "Time Required for Accurate Load Measurement" based on the fact that the process is also specified. |
|         |               | 15.10 | Wii Balance Board Operation Confirmation [Required]: <br> Replaced "Troubleshooting Mode" with "Wii Balance Board Confirmation" in the title. |
| 1.11 | 2008/10/31 | 13 | The revision history of version 1.10 was supposed to list items for "GGID" and "TGID" as changes to the Communications with Nintendo DS section. However, a typo caused these both to appear as "GGID." One of these has been corrected to "TGID." |
|         |               | 2.18 | [North American, European, Australian, and Korean Versions] License Display of Licensee Titles [Required]: <br> Added that developers and publishers should consult with Nintendo if displaying the "Licensed by Nintendo" logo at the channel banner screen is difficult considering other legal notices. |
|         |               | 7.2.26 | Settings for Automatic Disconnection of Wii Remote Communications [Recommended]: <br> Added an example of a situation in which the automatic disconnection time for the Wii Remote might be reduced. Also added a note prompting the reader to refer to 6.22 Changing Screen Burn-In Reduction Wait Time [Recommended] and 7.2.20 Displaying a Message Notifying Users That Wii Remote Transmissions Have Terminated [Recommended] (this note was in the Revision History but missing in the actual section in the previous version). |
|         |               | 12.7 | Display of Trademarked or Copyrighted Names in the Banner [Information]: <br> Standardized the terminology used to describe the channel banner screen, following the aforementioned update to section 2.18. |
| 1.10 | 2008/10/03 | 2.18 | [North American, European, Australian, and Korean Versions] License Display of Licensee Titles [Required]: <br> Updated to display "Licensed by Nintendo" according to the *Licensed by Nintendo Screen Package* and indicated the reason behind this update. |
|         |               | 2.19 | Using Firmware of Specified Versions [Required]: <br> Added the USB HID library to the conditions for the use of extended firmware. |

| Version | Revision Date | Item(s) Affected | Description |
|---------|---------------|------------------|-------------|
|         |               | 3.9 | Resetting and Shutting Down in Response to Fatal Errors [Required]: <br> Rewrote this section to make it easier to understand that error messages should continue to be displayed. |
|         |               | 4 | Sound: <br> Added section 4.5 Considerations for the User's Sound Output Environment [Information]. |
|         |               | 4.1 | Applying Wii System Sound Settings [Required]: <br> Updated to make it easier to understand how the sound setting on the Wii console must be used with some acceptable examples to apply. |
|         |               | 6 | Video: <br> Added the following sections. <br> • 6.25 Standardizing Aspect Ratios [Required] <br> • 6.26 Interlaced Display When Supporting Double-Strike Mode [Required] |
|         |               | 7.1.7 | Taking Differences Between Analog Values from Buttons and Control Sticks into Account [Required[: <br> Updated the heading from "Upper Limit Value of the Control Stick and Button Analog Input Value [Required]." <br> Rewrote this section to clarify that maximum values require caution because of individual differences. |
|         |               | 7.1.8 | Support for Analog Input Values Defined for Control Sticks and Buttons [Required]: <br> Updated the heading from "Analog Input Value Range of Control Stick and Button [Required]." <br> Rewrote this section to clarify that irregular behavior should be prevented for any value that is returned within the defined range. |
|         |               | 7.1.18.1 | Wii Remote Jacket Usage Table for General Applications: <br> Updated category descriptions. |
|         |               | 7.2.1 | Using the Relative Distance Between the Wii Remote and the Sensor Bar [Recommended]: <br> Replaced an example of a relative distance, which was given by mistake, with an example of an absolute distance. |
|         |               | 7.2.26 | Settings for Automatic Disconnection of Wii Remote Communications [Recommended]: <br> It was recommended that the time limit for automatically disconnecting communication with the Wii Remote not be changed from the standard setting unless absolutely necessary. This has been clarified to say that the time limit may be made shorter. |
|         |               | 8.2 | Limits on Frequent Rewrites [Required]: <br> Added a list of functions that update the FAT and had been slated to be released soon. |

| Version | Revision Date | Item(s) Affected | Description |
|---------|---------------|------------------|-------------|
|         |               | 8.11             | Notification When the Number of Inodes or the Amount of Free Memory Is Insufficient [Required]: <br><br> Removed instructions to display message NAND_10 because updates to messages NAND_02 and NAND_03 have removed the need to display NAND_10 onscreen. <br><br> Added conditions for not transitioning to the Data Management screen on the Wii Menu. <br><br> Removed a reference to section 8.26 Support for NAND_RESULT_MAXBLOCKS and NAND_RESULT_MAXFILES [Recommended], which has been deleted. |
|         |               | 8.14             | Handling Corrupted Wii Console NAND Memory [Required]: <br><br> Rewrote this to clarify that an error message should continue to be displayed. |
|         |               | 8.26             | ~~Support for NAND_RESULT_MAXBLOCKS and NAND_RESULT_MAXFILES~~ [Recommended]: <br><br> Deleted as the result of a guideline review. |
|         |               | 8.28             | Handling NAND_RESULT_UNKNOWN [Required]: <br><br> Changed from [Recommended] to [Required]. <br><br> Added a note that controller operations, RESET, and the Power Button will be ignored while the error message is being displayed. |
|         |               | 9                | Nintendo GameCube Memory Card: <br><br> Updated to say that the CARD library was removed from Revolution SDK 3.2. |
|         |               | 10.4             | Prohibiting Use of the OSRebootSystem Function [Required]: <br><br> Changed the heading from "Use of the OSRebootSystem Function [Recommended]." <br><br> Updated to prohibit use of the `OSRebootSystem` function and to state that other functions should be called to use Wii Menu features. |
|         |               | 11               | HOME Menu: <br><br> Added section 11.15 Displaying Messages Suited to Save Data Confirmation [Required]. |
|         |               | 13               | Communications with Nintendo DS: <br><br> Moved section 13.2.3 Which GGID to Use [Required] from section 13.2 MP Communications with the DS to section 13.1.4 Using GGIDs [Required] under section 13.1 General because it is also related to DS Download Play. <br><br> Moved section 13.3.2 TGIDs Used by the MPDL Library [Required] from section 13.3 DS Download Play to section 13.1.5 Using TGIDs [Required] under section 13.1 General, because it is also related to MP communications with the DS. |
|         |               | 15               | Wii Balance Board: <br><br> Added this chapter. |
| 1.09a   | 2008/08/11    | 2.1.8            | Revised Nintendo logo requirements. |

| Version | Revision Date | Item(s) Affected | Description |
|---------|---------------|------------------|-------------|
| 1.09 | 2008/06/17 | 1.4 | Items Warranting Special Mention: Added. |
| | | 2.17 | Parental Controls [Information]: Updated the name of the rating agency for Australia from OFLC to AGCB. |
| | | 2.18 | Updated the section heading from "[North American, European, and Australian Versions] License Display of Licensee Titles [Required]" to "[North American, European, Australian, and Korean Versions] License Display of Licensee Titles [Required]." |
| | | 3.12 | Prohibiting Disc Access Using the CNT Library in the Release Version [Required]: Added. |
| | | 6.18 | Support for the 4:3 Aspect Ratio [Required]: Rewrote to clearly indicate that the static image bands for the 16:9 aspect ratio are not within the rendering region, but instead outside of the region in the margin areas at the top and bottom of the screen. |
| | | 6.20 | Check Before Switching to Progressive Display [Required]: Re-updated the deleted item content as the result of a guideline review. |
| | | 6.23 | Support for 16:9 Aspect Ratio [Recommended]: Rewrote to clearly indicate that the static image bands for the 4:3 aspect ratio are not within the rendering region, but instead are outside of the region in the margin areas at the left and right of the screen. |
| | | 7.1 | Added the following sections.<br>• 7.1.18 Handling of the Wii Remote Jacket [Required]<br>• 7.1.18.1 Wii Remote Jacket Usage Table for General Applications<br>• 7.1.18.2 Wii Remote Jacket Usage Table for Applications Using Attachments |
| | | 7.1.1 | Updated the section heading from "Display when Extension Controller is Necessary [Required]" to "Display When a Controller Other Than the Wii Remote Is Necessary [Required]."<br><br>Replaced instances of "extension controller" with "controller other than the Wii Remote" so that messages will also be displayed for the Nintendo GameCube Controller as necessary.<br><br>Added a note that icons and so on may be displayed as well as messages.<br><br>Added a note stating that when more than one type of controller is required, messages should be displayed for each type.<br><br>Added a note to see section 14.4 Processing During Startup when a Keyboard Is Required [Required] for more information on USB keyboards. |
| | | 7.2.10 | Updated the section heading from "Error Handling when Writing to Wii Remote Memory [Required]" to "Handling WPAD_ERR_TRANSFER or WPAD_ERR_BUSY Errors when Writing to Wii Remote Memory [Required]."<br><br>Clarified that the covered errors are WPAD_ERR_TRANSFER and WPAD_ERR_BUSY. |
| | | 7.2.11 | Updated the section heading from "Error Handling when Reading from Wii Remote Memory [Required]" to "Handling WPAD_ERR_TRANSFER or WPAD_ERR_BUSY Errors When Reading from Wii Remote Memory [Required]." |

| Version | Revision Date | Item(s) Affected | Description |
|---------|---------------|------------------|-------------|
| | | | Clarified that the covered errors are `WPAD_ERR_TRANSFER` and `WPAD_ERR_BUSY`. |
| | | | Clarified that error correction should be performed on the data that was read. |
| | | 7.3 | Updated the section heading from "Nintendo GameCube<sup>TM</sup> Controller" to "Peripheral Devices That Connect to the Nintendo GameCube<sup>TM</sup> Controller Sockets." |
| | | | Updated content to be applicable to applications that support any peripheral device such as the GameCube Controller that connects to the Nintendo GameCube Controller Sockets. |
| | | | Added the following new sections. |
| | | | • 7.3.8 Prohibiting Applications That Require the Nintendo GameCube Controller [Required] |
| | | | • 7.3.9 Joint Use of the Nintendo GameCube Controller and Wii-Specific Peripheral Devices [Recommended] |
| | | | • 7.3.10 Restrictions on Peripheral Devices That Connect to the Nintendo GameCube Controller Socket [Required] |
| | | | • 7.3.11 Providing Rumble Feature Settings [Required] |
| | | 7.3.1 | ~~Application Support for the Nintendo GameCube Controller [Information]~~ [Deleted]: Corrected the section number of the reference in the Japanese version. |
| | | 7.3.2 | Use of Origin Reset Command as Game Input Prohibited [Required]: To improve readability, clarified that this item's instructions apply to the GameCube Controller. |
| | | 7.3.3 | Support for Origin Reset Command [Required]: To improve readability, clarified that this item's instructions apply to the GameCube Controller. |
| | | 7.3.4 | Updated the section heading from "Hot Swapping Support for Nintendo GameCube Controller Socket Devices [Required]" to "Hot Swapping Support for Peripheral Devices That Connect to the Nintendo GameCube Controller Sockets [Required]." |
| | | 7.3.5 | Frequency of Checks for Hot Swapping [Recommended]: To improve readability, clarified that this item's instructions apply to any peripheral device that connects to the Nintendo GameCube Controller Sockets. |
| | | 7.3.7 | Updated the section heading from "Stopping Access to the Optical Disc Drive in Scenes Where the User is Urged to Insert or Remove the Nintendo GameCube Controller [Required]" to "Stopping Access to the Optical Disc Drive in Scenes Where the User is Prompted to Insert Devices into or Remove Devices from the Nintendo GameCube Controller Sockets [Required]." |
| | | 7.4.1 | Displaying the Wii Zapper Usage Screen [Required]: |
| | | | Updated because Wii Zapper-only applications and Wii Zapper-compatible applications differ in how they determine if the Strap Usage screen should be displayed. |
| | | | In the English document, standardized the phrase "How To Hold the Wii Zapper screen" to "Wii Zapper Usage screen." |
| | | 8.20 | Save Data Comments [Required]: |

| Version | Revision Date | Item(s) Affected | Description |
|---------|---------------|------------------|-------------|
| | | | Restructured the usable characters into a table that includes Chinese and Korean. |
| | | | Added a note to confirm that comments longer than 20 characters are displayed properly when they are set. |
| | | 8.26 | Support for NAND_RESULT_MAXBLOCKS and NAND_RESULT_MAXFILES [Recommended]: Clarified that error messages are printed in the Wii Message List so that the reader is aware of this fact. |
| | | 8.28 | Handling NAND_RESULT_UNKNOWN [Recommended]: Added. |
| | | 9 | Nintendo GameCube Memory Card: Indicated that the CARD library should not be linked when generating master data. Added a note explaining how to check that the library is not being linked. |
| | | 11.3 | Display Language for the HOME Menu [Required]: Added Chinese and Korean to the table. |
| | | 11.6 | Support for HOME Menu by Classic Controllers [Required]: Updated from [Recommended] to [Required]. |
| | | 11.11 | Added a note stating that the instructions under "Displaying the Icon" in the HOME Menu Library function reference should be followed as closely as possible for fade-ins, fixed display time, and fade-outs for the HOME Menu Disabled Icon. |
| | | 12.1 | Icon Animation [Required]: Mentioned that animation does not need to be played in the Wii Menu's Channel Data Selection screen. Added section 12.11.4 Layout Specifications Prior to Channel Script Execution [Required] as a reference. |
| | | 12.2 | Use of Text Boxes for Icon Layout [Required]: Updated descriptions of the Wii bitmap fonts because they are now included in Revolution SDK. |
| | | 12.4 | Title Display in the Banner [Required]: Deleted a mistaken item number for a reference document. |
| | | 12.6 | Use of Text Boxes for Banner Layout [Required]: Updated descriptions of the Wii bitmap fonts because they are now included in Revolution SDK. |
| | | 12.11 | Channel Script: Added. |
| | | 13 | Communications with Nintendo DS: Noted that DS applications should follow the Nintendo DS Programming Guidelines. |
| 1.08 | 2008/04/02 | | Standardized the notation regarding inquiries to Nintendo. Standardized the leads for each section, noting that its content is to be supported. Standardized the names for the Strap Usage screen, the Disc Channel, and |

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| | | | the Channel Banner screen. |
| | | 2.1 | Deleted mention of Nintendo GameCube Memory Card. |
| | | 2.21 | Added. |
| | | 2.21.1 | Added. |
| | | 2.21.2 | Added. |
| | | 2.22 | Added. |
| | | 2.22.1 | Added. |
| | | 2.22.2 | Added. |
| | | 2.3 | Updated content to clearly state that the restriction does not include the 100 frames necessary for switching from progressive to interlaced display, or from EURGB60 to PAL display. |
| | | 2.6 | Updated, changing the reference to library and tool versions to read "latest package." Clearly stated that this involves Revolution SDK and its patches and related tools distributed by Nintendo. |
| | | 2.7 | Rewrote so it is easier to understand that caution is needed when creating the master data. Restructured the paragraph order so that the flow of text is easier to understand. |
| | | 2.8 | Updated contents to talk about access to devices via OS and Revolution SDK. |
| | | 2.16 | Deleted mention of Nintendo GameCube Memory Card and added mention of signatures and authentication as measures against alteration of loaded data. |
| | | 2.18 | Added links for banners that display "Licensed by Nintendo" and for the Strap Usage screen. |
| | | 2.19 | Updated the terminology, changing "network-compatible firmware" to "extension firmware, and changing "non-network-compatible firmware" to "standard firmware." |
| | | 2.20 | Mentioned that the DOL file size should be considered in the OSExec* function example. Also added sound as means of verifying user operation of Controller, and added the request that Nintendo be contacted if display needs to be in static state for longer than 10 seconds. |
| | | 3.3 | Rearranged for easier comprehension. Added criteria for prolonged, continuous non-sequential access. |
| | | 3.7.1 | Added. |
| | | 3.7.2 | Inserted content from section 3.7. |
| | | 6 | Standardized subheads and content in the following ways. Added the word "display" to references to progressive and interlaced. Updated content to clarify that display can be switched from progressive |

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| | | | display to interlaced display, and from EU RGB 60 display to PAL display. |
| | | 6.5 | Changed the title to "Procedure for Switching from Progressive Display to Interlaced Display [Recommended]". Previously it read "Interlaced/Progressive." Also updated content to read more clearly. |
| | | 6.6 | Deleted because there is no operation switching display mode from interlaced to progressive. |
| | | 6.7 | Deleted because the information duplicates the content in section 6.5 Procedure for Switching from Progressive Display to Interlaced Display [Recommended]. |
| | | 6.8 | Added the word "display" to the section's title and content. |
| | | 6.11 | Changed the title to "Switching from EURGB60 to PAL [Recommended]". Previously it read "PAL/EU RGB 60". Also updated the content to read more clearly. |
| | | 6.12 | Deleted because there is no operation switching display mode from PAL to EU RGB 60. |
| | | 6.13 | Deleted because the information duplicates the content in section 6.11 Switching from EURGB60 to PAL [Recommended]. |
| | | 6.14 | Deleted because there is no requirement for applications to support library checking. |
| | | 6.18 | Rewrote the letterboxing example to be easier to understand. |
| | | 6.20 | Deleted because this is checked with the VIGetScanMode function. |
| | | 6.21 | Added an example that describes how turning power off and on to the Wii Remote Pointer can make the burn-in reduction feature inoperative. |
| | | 6.23 | Rewrote the pillarboxing example to be easier to understand. |
| | | 6.24 | Updated the content relating to brightness. |
| | | 7.1.3 | Added a link (to section 7.4.1) for applications that support the Wii Zapper. |
| | | 7.2.4 | Added a note regarding the burn-in reduction feature when the KPADEnableDPD or KPADDisableDPD functions are used. |
| | | 7.2.25 | Corrected the Japanese version of this section. |
| | | 7.4 | Added. |
| | | 8.2 | Clarified that the restriction in this section is in regard to updating the FAT. Added comments about temporary editing and replaced the text about the NANDSafe series with text about the NANDSimpleSafe series API for auto-saving, |
| | | 8.11 | Revised. The OSReturnToMenu function was replaced with the OSReturnToDataManager function, which can update the Wii Menu and return to the Data Management screen. Clarified that a message such as NAND_10 from the Wii Message List should be displayed if not moving to the Wii Menu's Data Management screen. |

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| | | 8.18 | Moved the content to section 8.18.1 Timing of Creation [Required] and added section 8.18.2 Check the Save Banner File [Required]. |
| | | 8.20 | Deleted mention of a bug workaround because the Wii Menu has been updated. |
| | | 8.27 | Deleted because the Wii Menu has been updated so this is no longer necessary. |
| | | 9 | Deleted all sections of this chapter because the use of the Nintendo GameCube Memory Card has been prohibited and the CARD library will be deleted from a soon-to-be-released Revolution SDK. |
| | | 11.14 | Added. |
| | | 13.3.1 | Deleted because starting with Revolution SDK Extensions 2.1, Wii games can also specify DS Single Card Play icons. |
| 1.07 | 2008/01/31 | | 2.15 [N. American Version Only] Displaying the ESRB Online Rating Notice for Applications Using Network Features [Required] Updated the heading from "[N. American Version Only] Displaying a Cautionary Notice for Applications Using Online Features [Required]". Updated contents. Updated the content also. 6.18 Support for 4:3 Aspect Ratio [Required] Mentioned that it is permissible to display static images in the margins, in a manner that resembles letterboxing, and that 6.24 Avoiding Screen Burn-In Caused by Static Display [Information] should be referenced for information on displaying static images. 6.23 Support for 16:9 Screen Ratio [Recommended] Mentioned that it is permissible to display static images in the margins, in a manner that resembles pillarboxing, and that 6.24 Avoiding Screen Burn-In Caused by Static Display [Information] should be referenced for information on displaying static images. 6.24 Avoiding Screen Burn-In Caused by Static Display [Information] Removed the pillarboxing and letterboxing examples of fixed displays that can cause screen burn-in. 8.4 Write Operation Display [Required] Removed the directive to show NAND_01 from the *Wii Message List* before starting a write operation. 14.1 Operation Verification on Specified Models Mentioned that the color of the "Classic Keyboard 200" is irrelevant. |
| 1.06 | 2007/12/19 | 2 | Added the following items. • 2.19 Using Firmware of Specified Versions [Required] • 2.20 Time Restriction when Screen is in Static State [Required] |
| | | 3.2 | Changed the reference to "Wii Optical Disc Drive Guidelines." |
| | | 3.8 | Revised description to state that program loading is performed by the Wii Menu rather than the IPL. Updated the reference to "Wii Optical Disc Drive Guidelines." |

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| | | 3.10 | Divided the sentence that described the reset process and shutdown process into two sentences to be more easily understood. |
| | | 4.1 | Clarified that when the application has separate settings, the Wii console settings are applied to these separate settings when the application is launched initially. |
| | | 6.4 | Deleted mention of Revolution SDK 2.2 Patch 10.<br>Also deleted mention of applications that do not support progressive display. |
| | | 6.10 | Deleted mention of Revolution SDK 2.2 Patch 10.<br>Also deleted mention of applications that do not support EU RGB 60 display. |
| | | 6.16 | Clarified that when the application has separate settings, the Wii console settings are applied to these separate settings when the application is launched initially. |
| | | 6.21 | Updated. |
| | | 6.22 | Updated. |
| | | 6.22.1 | Deleted in line with changes to 6.21 and 6.22. |
| | | 7.1.5 | Added the case of operating an unsupported extension controller as a relevant example. |
| | | 7.1.16 | Changed heading from "Handling Unsupported Extension Controllers [Required]."<br>Also mentioned that the `WPADAttachDummyExtension` and `WPADDetachDummyExtension` functions were prepared for debugging in order to verify behavior when an unsupported extension controller is connected or disconnected. |
| | | 7.2.10 | Clarified that the Wii Remote memory is physically damaged when re-accessing fails three times. |
| | | 7.2.11 | Clarified that the Wii Remote memory is physically damaged when re-accessing fails three times. |
| | | 7.2.16 | Restored a previously deleted item as a [Recommended] item. |
| | | 7.2.17 | Changed heading from "Halting Data Transfers when No Output Occurs on the Wii Remote Speaker [Recommended]."<br><br>Also, separately clarified the description of processing when sound is not output for a period of time and when sound is output frequently. |
| | | 7.2.18 | Added a specific use example, and deleted reference to the "Wii Remote and Nunchuk Hardware Overview." |
| | | 7.2.27 | Updated the relevant conditions for this item. Also provided more information for the case when returning to the application from the HOME Menu. |
| | | 7.3.7 | This item was added. |
| | | 8.3 | The "NAND Library Error Types and Handling" table was moved to the "Introduction" page of the NAND API description in the *Function Reference* |

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| | | | *Manual* as "Handling Result Codes." Accordingly, the table was deleted and a reference to the new location was added. In addition, a more detailed description of the reference was made. |
| | | 8.4 | Clarified that the data for which damage should be prevented is important data, and added explanation regarding data that does not need to be displayed. |
| | | 8.7 | Changed the heading from "Reset Handling" to easily differentiate it from 10.1 Wii Console RESET [Required]. |
| | | 8.8 | Added a caution for informing the user about required memory space. |
| | | 8.12 | Restructured the sentence to emphasize the concern for changing file sizes. |
| | | 8.24 | Added information regarding protection against tampering on the application side. |
| | | 10.1 | Added that 8.7 Handling Reset While Writing [Required] should be referenced regarding handling while writing to the Wii Console save memory. |
| | | 11.5 | Deleted this item. |
| | | 11.13 | Clarified that the sound volume "setting" should be set to 0. |
| | | 13.3.2 | Revised so that the timing by which TGID becomes a different value changes when communications begin. |
| | | 14 | This section was added to support USB Keyboard. |
| 1.05a | 2007/09/27 | 13.3.2 | Corrected heading. |
| 1.05 | 2007/08/10 | Revision History | Corrected errors in sections 8.13, 8.14, 8.27, 10.6, and 12.8 of the revision history for Version 1.04. |
| | | 1.2 | Deleted the fact that some of the referenced documents were being updated and therefore may not have contained the information being referenced. |
| | | 1.3 | Added the new section "Do Not Use Wii Development and SDK Files on Other Platforms." |
| | | 2.10 | Some content that referred to "Normal Operation after the Disc Drive Motor Is Shut Off From a Period of Inactivity" was still present, so it was deleted. |
| | | 2.13 | Clarified that the warning screens for which display is prohibited is limited to screens relating to Health and Safety Precautions. |
| | | 3.9 | Added a note to refer to section "3.11 Message Display in Response to Fatal Errors [Required]," for details about fatal error messages. |
| | | 3.11 | Added the new section "Message Display in Response to Fatal Errors [Required]." |
| | | 6.24 | Added the new section "Avoiding Screen Burn-in Caused by Static Display [Information]." |
| | | 7.1.1 | Added the fact that there is no need to display the message if it has been confirmed that the extension controller required by the application has |

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| | | | already been connected. |
| | | 7.2.14 | Explained the conditions in greater detail, namely that [the message should be displayed when an error is detected using a checksum of the data in the Wii Remote memory or other such means, or when the WPADReadGameData function returns WPAD_ERR_BROKEN. |
| | | 8.1 | There was no caption for the table, so it was changed to "Usage Limitations for Wii System Memory." |
| | | 8.3 | There was no caption for the table, so it was changed to "NAND Library Error Types and Handling." |
| | | 8.11 | Added the fact that there is no need to display a message if there is no need to notify the user of the reason that the save could not be performed. |
| | | 8.14 | Corrected "display a message like that of NAND_08" to "display the NAND_08 message exactly" because this section is referring to NAND_08, which is marked as "Changes prohibited" in the *Wii Message List*. |
| | | 9.5 | There was no caption for the table, so it was changed to "Errors Displayed when Memory Cards cannot be Used." |
| 1.05 | 2007/08/10 | 10.1 10.2 | These paragraphs previously directed the user to refer to the Reset and Shutdown Programming Manual for details regarding the pre-processing for resets and shutdowns, respectively. The wording has been changed so that the user should refer to this document regarding the overall content. |
| | | 11.3 | There was no caption for the table, so it was changed to "Selectable Languages for Each Market." |
| | | 13 | Added a new chapter, "Communications with Nintendo DS" |
| 1.04 | 2007/05/31 | All | Changed the organization of content, as described below. Added internal document links to the "Revision Items" column of the Japanese version 1.04 Revision History table and the content of the precautions. Formally moved all messages to the *Wii Message List*, and added notes about referencing the *Wii Message List*. |
| | | 2.1 | Changed from [Information] to [Required]. |
| | | 2.3 | Based on the fact that the screen displayed right after startup is the Strap usage screen, added clarification regarding the screen to be displayed. Added a reference to the Strap usage screen. Deleted the section that had referenced "Wii File Restriction" in the "Revolution Optical Disc Drive Library manual." |
| | | 2.5 | Given the policy that explanations for legal rights notations will be given in each library and tool, the text stating that there were "plans to distribute a document compiling various library tool rights displays" was deleted. |
| | | 2.6 | The heading was changed from "Library Version" to "Library and Tool Versions." Added a note about tools to the content. |

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| | | 2.9 | Added MIDI adapters as an example of libraries for which releases are prohibited. |
| | | 2.10 | Updated this paragraph to ensure that fatal bugs like errant processes or freezes do not occur, even if the application is run for a long time. The heading was also changed from "Demo Screen Loop Processing" to "Guaranteeing Extended Operation of the Application." |
| | | 2.11 | This paragraph merely referenced content explained in other paragraphs, so it was deleted. |
| | | 2.12 | Added a list of the items in Wii console configuration. Changed from [Information] to [Required]. |
| | | 2.18 | The description of the size and type of font required was difficult to understand, so it was rewritten. |
| 1.04 | 2007/05/31 | 3.3 | Changed the heading from "Infinite Loops During Multiple Data Streaming Prohibited" to "Prohibition of Non-Sequential Access Performed Continuously for Long Periods of Time." Revised the description to include that continuous, non-sequential access for long periods of time is prohibited in order to prevent shortening the life span of the drive and reduce seek noise. |
| | | 3.4 | Revised the description regarding the required message to refer to DISC_06 of the *Wii Message List*. |
| | | 3.5 3.6 | Shutting off the disc drive motor does not have an effect on the currently provided development environment, so deleted these paragraphs. |
| | | 3.9 3.10 | Added the following new items: Resetting and Shutting Down in Response to Fatal Errors [Required] Resetting and Shutting Down in Response to Disc Errors Other Than Fatal Errors [Required] |
| | | 4.1 4.2 4.3 | Combined the following items into "4.1 Applying Wii System Sound Settings [Required]": <br>• "Sound Setting [Information]" <br>• "Application of Wii Console System Sound Settings [Required]" <br>• "Sound Output for Applications Supporting Multiple Sound Settings [Required]" |
| | | 6.1 | Added a statement about the safe frame for a 16:9 aspect ratio. |
| | | 6.2 | Deleted because its contents were redundant with the content indicated in the guidelines in the "Video" section. |
| | | 6.4 6.10 | Added a statement that changing the settings is prohibited with Revolution SDK 2.2 Patch10, which contained a function for changing the items in Wii System Settings that relate to progressive display and EURGB60. Made it clear that the appropriate displays are either interlaced or progressive, and either PAL50 or EURGB60, respectively. |
| | | 6.5 | Because the screen displayed right after startup is the Strap usage screen, clarified the screens to be displayed. |

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| | | 6.11 | Added a reference point for the Strap usage screen. |
| | | 6.14 | Deleted MPAL. |
| | | 6.15 | Added that anamorphic widescreen is recommended. |
| | | 6.16 | Clarified that the appropriate display is either 4:3 or 16:9.<br><br>Previously it was stated that changing items in Wii System Settings that relate to the 16:9 aspect ratio was prohibited when using Revolution SDK 2.2 Patch 10, but the function in question is not being provided, so the statement was deleted. |
| | | 6.19 | Made a correction to refer to the "Video Interface Library" Programming Manual instead of the "Video Interface Library" Programming Guidelines. |
| 1.04 | 2007/05/31 | 6.23 | Added the reason that a 16:9 screen aspect ratio is recommended to the description.<br><br>Added a reference to the "Video Interface Library" Programming Manual. |
| | | 7.1.1 | Deleted the example message.<br><br>Added a reference to CONT_01 and CONT_02 in the *Wii Message List*. |
| | | 7.1.16 | Added to the description that with Revolution SDK 2.4 Patch 6 and later, functions have been added for changing the device type of the Wii Remote without actually inserting an extension controller. |
| | | 7.1.17 | "Handling HOME" was moved from the "Wii Remote" section.<br><br>The fact that the "HOME Menu is displayed immediately if HOME is pressed on the Wii Remote" was redundant with the "HOME Menu" section, so it was deleted.<br><br>Changed the reference target to "HOME Menu." |
| | | 7.2.2 | Moved "Handling HOME [Required]" to the "All Controllers" section. |
| | | 7.2.4 | Changed the text "when the pointer is not being used" to read "in scenes that do not use the Pointer." |
| | | 7.2.5 | Added to the description that output from the speaker won't be correct if it is being used at the same time as the Wii Remote memory. |
| | | 7.2.8<br>7.2.9 | Deleted the example message.<br><br>Added a reference to CONT_03 of the *Wii Message List*. |
| | | 7.2.10<br>7.2.11 | Added that CONT_04 of the *Wii Message List* should be displayed if rewriting to or rereading from the Wii Remote memory fails three times. |
| | | 7.2.14 | Deleted the example message.<br><br>Added a reference to CONT_05 in the *Wii Message List*. |
| | | 7.2.15 | Deleted the example message.<br><br>Added a reference to CONT_06 and CONT_07 in the *Wii Message List*. |
| | | 7.2.16 | Deleted, because it was verified that there is no need to prohibit continuous play on the Wii Remote speaker. |

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|  |  | 7.2.19 | Deleted the example message. Added a reference to CONT_09 in the *Wii Message List*. |
|  |  | 7.2.20 | Deleted the example message. Added a reference to CONT_10 in the *Wii Message List*. |
|  |  | 7.2.23 | Deleted the example message. Added a reference to CONT_11 in the *Wii Message List*. |
|  |  | 7.2.24 | Deleted this paragraph; "One Time Mode Synchronization" will only be listed in the Wii Terminology, as is the case with all other terms. |
| 1.04 | 2007/05/31 | 7.2.25 | Changed the heading from "Independent Adjustment of Wii Remote Speaker Volume by Applications" to "Prohibition of Using the WPADSetSpeakerVolume function." Deleted the condition "If the application has its own independent option setting for the Wii Remote speaker volume." |
|  |  | 7.2.26 7.2.27 | Added the following new sections: "Settings for Automatic Disconnection of Wii Remote Communications [Recommended]." "Handling When a Wii Remote is Connected to a Player Number not Used by the Application [Recommended]." |
|  |  | 7.3 7.3.1 | The content of "7.3.1 Application Support for the Nintendo GameCube Controller [Information]" is a description that relates to all Nintendo GameCube Controller sections, so this item was deleted from this 7.3.1 and moved to 7.3. |
|  |  | 8.3 | Changed the handling of the following errors from "Errors that applications must handle" to "Errors that applications are expected but not required to handle (for which a bug report to Nintendo is expected)." <ul><li>NAND_RESULT_ALLOC_FAILED</li><li>NAND_RESULT_BUSY</li></ul> |
|  |  | 8.4 | Deleted the example message. Added a reference to NAND_01 and NAND_09 in the *Wii Message List*. |
|  |  | 8.11 | Deleted the example message. Added a reference to NAND_02, NAND_03, and NAND_10 in the *Wii Message List*. Deleted description for saving multiple files. Added the description "When there is insufficient memory available and an insufficient number of available inodes at the same time, the insufficient memory available message should be given higher priority for displaying." Added a note about referencing the section on NAND_RESULT_MAXBLOCKS and NAND_RESULT_MAXFILES. |
|  |  | 8.13 | Changed the rank from [Recommended] to [Required]. Deleted the example message. Added a reference to NAND_07 in the *Wii Message List*. |
|  |  | 8.14 | Changed the rank from [Recommended] to [Required]. |

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| | | | Deleted the example message. Added a reference to NAND_08 in the *Wii Message List*. |
| | | 8.15 | Made it clear that this is an optional item for an occasion when one wants to save data immediately before the shutdown process. Because an addition was made to "Wii Power Button [Required]" regarding shutdowns via hardware, a note about referring to that section was added. |
| 1.04 | 2007/05/31 | 8.18 | Updated this paragraph so that it indicates: That save banner files are created at the end of the sequence that creates the minimum required files starting at the state in which there are no files in the home directory. and That initial startup is an example of a state in which there are no files. |
| | | 8.25 8.26 | Added the following new items: • "Prohibition of Usage Restrictions on Save Data Due to Wii Console-Specific Information [Required]." • "Support for NAND_RESULT_MAXBLOCKS and NAND_RESULT_MAXFILES [Recommended]." |
| | | 8.27 | Moved the explanation about precautions when creating save banners from "12 Icons and Banners" to 8.27. |
| | | 9 9.1 | The content of "Nintendo GameCube Memory Card Compatible Application [Information]" is a description that relates to all sections of Nintendo GameCube Memory Card, so this item was deleted from 9.1 and moved to Chapter 9 description. |
| | | 9.5 | Added a correspondence chart between the conditions for error display and the *Wii Message List* IDs. |
| | | 10 | Changed the heading from "Reset" to "Reset and Shutdown." |
| | | 10.1 | The descriptions of exceptions relating to fatal errors of the optical disc drive was moved to a new section "Resetting and Shutting Down in Response to Fatal Errors [Required]" and deleted from here. |
| | | 10.2 | The descriptions of exceptions relating to fatal errors of the optical disc drive was moved to be the new section "Resetting and Shutting Down in Response to Fatal Errors [Required]" and deleted from here. Added a note about shutdown via hardware. |
| | | 10.3 | Revised the description about reset operations, following a change to the "Restrictions on Operations for Resets." |
| | | 10.4 | Changed the term "hot reset" to specifically refer to the "OSRebootSystem function." |
| | | 10.5 | The content of this paragraph was redundant with "Wii Console RESET [Required]" and "Wii Power Button [Required], so it was deleted. |
| | | 10.6 | The former heading, "Prohibition Against Using the Nintendo GameCube Controller Reset Command [Required]," was changed to "Restrictions on Operations for Resets." |

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| | | | Deleted the description about the Nintendo GameCube Controller reset command. |
| | | | Deleted "on the Wii Remote" from the phrase "the HOME Button Menu on the Wii Remote" (in the Japanese version). |
| 1.04 | 2007/05/31 | 11.2 | Added that the HOME Menu must be displayed immediately if HOME is pressed, and that a confirmation message must not be displayed. |
| | | 11.4 | Added "Settings and Display for 16:9 Screen Ratio Display Supported Application" as a reference. |
| | | 11.5 | Added the handling when a Wii Remote is connected to a player number not used by the application following the addition of the new section "Handling When a Wii Remote is Connected to a Player Number not Used by the Application [Recommended]." |
| | | | Changed the heading from the former "Using HOME Menu from All Connected Wii Remotes" to "Using the HOME Menu from All Paired Wii Remotes." |
| | | 11.6 | Changed the level of importance from [Required] to [Recommended]. |
| | | 11.8<br>11.8.1<br>11.8.2 | Restructured the former paragraph "Restrictions on Rumble when the Application has its own Rumble Settings [Required]" as the following three items:<br>Restrictions on Rumble Feature<br>Restrictions Due to the Rumble Setting of the HOME Menu [Required]<br>Prohibition of Changing the Rumble Setting of the HOME Menu [Required] |
| | | 11.11 | Added the conditions for not displaying HOME.<br>Changed the level of importance from [Required] to [Recommended]. |
| | | 11.13 | Added a new paragraph "Sound Volume When Entering and Exiting the HOME Menu [Required]." |
| | | 12.1 | Added that animations are required in order to make the Wii Menu look like an interface to a television channel. |
| | | 12.8 | Moved [this paragraph] to Chapter "8 Wii System Memory" because it describes cautions for creating save banners. |
| | | 12.9 | Added the statement that sound is required in order to make the Wii Menu feel like an interface to a television channel. |
| | | 12.10 | Added the [Required] notation because it had previously been missing. |
| 1.03 | 2007/02/07 | 8 | Notification When the Number of inodes or the Amount of Free Memory Is Insufficient [Required]. |
| 1.02 | 2007/02/01 | All | Combined precautions from the following three documents:<br>• Icon and Banner Specifications<br>• Wii Save Data Creation Guidelines<br>• HOME Menu Implementation Specifications<br>In the Japanese version, the term "Wii system memory" has been replaced and standardized to "Wii system NAND memory" (no changes to the User |

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| | | | terminologies for messages). The English version will continue to use "Wii system memory."<br><br>Standardized the reference target name for individual sections. |
| | | 2 | Moved Startup Disc Error Handling [Required] to Chapter 3.<br><br>Replaced the contents in Integrating Banners, Comments, and Icons [Information] with a reference to related items, and changed the level of importance.<br><br>Referencing and Changing Wii System Settings updated to Application of Wii System Settings [Required].<br><br>Combined the two sections "Display of Health and Safety Warning" and "Application Startup Display Message" and updated as Prohibition of Warning Display by Applications [Required].<br><br>Updated Program Distribution Method [Required] and Parental Controls [Information].<br><br>Added [North American, European, and Australian Versions] License Display of Licensee Titles [Required]. |
| | | 3 | Updated Wii Game Disc Error Handling [Required].<br><br>Updated Normal Operation after the Disc Drive Motor Is Shut Off From a Period of Inactivity [Required].<br><br>Moved "Startup Disc Error Handling" from Chapter 3. |
| | | 6 | Updated Support for Progressive Display [Recommended], PAL 50 Support [Required], Settings and Display for Applications That Support 16:9 Screen Ratio Display [Required], and Checking the On-Screen Display During Application Startup [Required].<br><br>Updated Applying Screen Burn-in Reduction Setting [Required] and changed the level of importance.<br><br>Added Changing Screen Burn-in Reduction Wait Time [Recommended], Restrictions for Non-Activation of Screen Burn-in Reduction [Required], and Support for 16:9 Screen Ratio [Recommended]. |
| | | 7.1 | Updated Display When Extension Controller is Necessary [Required], Explanatory Message for Wii Remote Strap Use [Required], and Check Before Switching to Progressive Display [Required].<br><br>Updated the heading "Prohibition on the Use of Origin Reset Command for the Analog Input of the Extension controller" as Do Not Use Origin Reset Command for Extension Controller Analog Input as Game Input [Required].<br><br>Added Handling Unsupported Extension Controllers [Required]. |
| 1.02 | 2007/02/01 | 7.2 | Updated Handling HOME [Required], Disabling Pointer for Applications Without Pointer Function [Required], Disabling Pointer for Applications with Pointer Function [Recommended], Prohibition of Simultaneous Use of Wii Remote Memory and Wii Remote Speaker [Required], Wii Remote Data Error Checking [Required], Message Display When Writing to Wii Remote Memory [Required], Message Display When Loading Wii Remote Memory [Recommended], ~~Data Compatibility for the Same Application Using Wii Remote Memory [Required]~~.<br><br>Updated the heading "Prohibition of Application Dependent on Wii Remote Memory Access Speed" as Prohibition of Operations Dependent on Wii Remote Memory Access Speed [Required] and updated the content.<br><br>Updated the heading "Handling Damage to Wii Remote Memory" as |

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|         |               |                  | Handling Data Corruption in Wii Remote Memory [Recommended] and updated the content. |
|         |               |                  | Updated Continuous Play on the Wii Remote Speaker [Required]. |
|         |               |                  | Updated the heading "Audio Cut off of Speaker due to Poor Signal Sensitivity" as Speaker Sound Quality under Poor Signal Conditions [Recommended] and updated contents. |
|         |               |                  | Updated Displaying a Message Notifying the User That Battery Charge Is Low [Recommended]. |
|         |               |                  | Added Application of Pause Function at Termination of Wii Remote Communication [Information], Specification of Simple Pairing Procedure [Required], Message Displayed During Simple Pairing [Required], Display Format for Simple Pairing [Required], Prohibition of Using the WPADSetSpeakerVolume Function [Required]. |
|         |               | 7.3              | Updated the contents and the level of importance of Nintendo GameCube WaveBird Wireless Controller Support [Information]. |
|         |               | 8                | Updated Restrictions on Wii System Memory [Required] and Handling Corrupted Wii System Memory [Required]. |
|         |               |                  | Added Prohibition of Creating Files or Directories Without Owner Read Permission [Required], Prohibition of Frequent Read Access [Required], Save Banner File Creation [Required], Precautions for Creating Save Data [Information], Save Data Comments [Required], Save Data Location Specification [Required], Prohibition of Using Reserved Names [Required], Precautions Regarding the nocopy Directory [Required], and Save Data Tampering Protection by the Wii Console [Information]. |
|         |               | 10               | Updated Wii Console RESET [Required], Wii Power Button [Required], and Resetting the Nintendo GameCube Controller Origin during Reset Operations [Required]. |
|         |               | 11               | Added the chapter "HOME Menu." |
|         |               | 12               | Added the chapter "Icons and Banners." |
| 1.01    | 2006/10/06    | 2                | Deleted "Boot Caching." |
|         |               | 3                | Added "Prohibition on Drive Specification Dependency." |
|         |               | 4                | Updated "Sound Setting," and "Sound Output for Applications Supporting Multiple Sound Settings." |
|         |               | 5.6              | Edited brightness formula used for photosensitivity. |
|         |               | 6                | Added "Video Settings." |
|         |               |                  | Updated "Settings and Display for EURGB60 Supported Application" and "Reset Operation during Progressive Output." |
|         |               |                  | Updated "Test of Different TV Reception Formats" as "Maintaining Appropriate Video Output." |
|         |               |                  | Added "Checking the On-screen Display during Application Startup" and "Check Before Switching to Progressive Display." |
|         |               |                  | Updated "Applying the Raster Burn Mitigation Setting." |

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| | | 7 | Updated "Explanatory Message for Strap Use." |
| | | | Updated "Using Wireless LAN" as "Frequency Band Usage when Using a Wireless LAN." |
| | | | Updated "Support for Changes in the Wii Remote and Sensor Bar Distance" to "Using the Relative Distance between the Wii Remote and the Sensor Bar." |
| | | | Added "Restrictions on Contents of Data Written to Wii Remote Memory." |
| | | | Updated "Continuous Play on the Wii Remote Speaker." |
| | | | Updated "Handling Audio Data Transmissions Stopped by the Feature for Avoiding Audio Cutoff" as "Audio Cutoff of Speaker due to Poor Signal Sensitivity." |
| | | 8 | Updated "Write Operation Display," "Data Unit for Users," "Checking the Amount of Free Memory and Number of Free inodes Using NANDCheck[Async]," "Notification When the Amount of Free Memory or Number of inodes is Insufficient," and "Handling Corrupted Wii System Memory." |
| | | 9 | Added "Prohibition on Programs Depending on the Access Speed of Nintendo GameCube Memory Cards." |
| | | 10 | Updated "Wii Console RESET," and "Wii Power Button." |
| | | | Changed the title heading "Reacquisition of Origin for GameCube Controller during Reset Operation" to "Reset the Nintendo GameCube Controller Origin during Reset Operations." |
| 1.00 | 2006/09/21 | 2 | Updated "Prohibition of Dependency on Device Specifications." |
| | | 7.1 | Updated "Handling +Control Pad Input." |
| 1.00 | 2006/09/21 | 7.2 | Updated "Support for Changes in the Wii Remote and Sensor Bar Distance." |
| | | | Changed "Limitations on Use of HOME" to "Handling HOME." |
| | | | Added "Prohibition of Simultaneous Use of Wii Remote Memory and the Wii Remote Speaker." |
| | | | Added "Data Compatibility for the Same Application using Wii Remote Memory," "Prohibition of Application Dependent on Wii Remote Memory Access Speed," "Handling Damage to Wii Remote Memory," and "Displaying a Message when Overwriting Wii Remote Memory." |
| | | | Updated "Handling Audio Data Transmissions Stopped by the Feature for Avoiding Audio Distortion." |
| | | | Changed "Specifying a Message Notifying the User that Battery Charge is Low" to "Displaying a Message Notifying the User that Battery Charge is Low." |
| | | | Changed "Specifying a Message Notifying Users that Wii Remote Transmissions Have Terminated" to "Displaying a Message Notifying Users that Wii Remote Transmissions Have Terminated." |
| | | 8 | Updated "Notification When the Amount of Free Memory or Number of inodes is Insufficient," "Handling Corrupted Files," and "Handling Corrupted Wii System Memory." |
| | | 9 | Changed "Support for Non-Japanese Spec GameCube Memory Cards" to "Errors Displayed when Memory Cards Cannot be Used." |

| Version | Revision Date | Item(s) Affected | Description |
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| 0.98 | 2006/09/15 | Overall | Standardized terminology to use "Wii system memory." |
| | | 2 | Added section 2.18 Parental Controls. |
| | | 3 | Added that the feature for stopping the disc drive motor does not work under Revolution SDK 2.2 Patch. |
| | | | Deleted "Error Display when Disc Eject Button is Pressed." |
| | | 5 | Updated text. Added figures, graphs, and tables. Added information on calculating screen brightness. |
| | | 6 | Added "Applying the Raster Burn Mitigation Setting." |
| | | 7.1 | Updated "Explanatory Message for Wii Remote Strap Use." |
| | | | Updated "Lower Limit Value of the Control Stick and Button Analog Input Value," "Upper Limit Value of the Control Stick and Button Analog Input Value," and "Analog Input Value Range of Control Stick and Button." |
| | | | Deleted "Vibration Enabled/Disabled Mode Switch Function." |
| | | | Updated "Do Not Use the Origin Reset Command for the Analog Input to an Extension Controller." |
| 0.98 | 2006/09/15 | 7.2 | Updated "Limit Use of HOME" and "Disabling Pointer for Application Without Pointer Function." |
| | | | Deleted "A Caution about Data Loss for Wii Remote Memory." |
| | | | Changed the level of importance of "Message Display when Writing to Wii Remote Memory." |
| | | | Standardized terminology to use the word "speaker." |
| | | | Combined "Handling Audio Cutoff of Speakers Due to Plugging in the External Extension Controller" and "Handling Audio Cutoff of Speakers Due to Packet Loss" to form "Handling Audio Data Transmissions Stopped by the Feature for Avoiding Audio Cutoff." |
| | | | Added "Specifying a Message Notifying the User that Battery Charge is Low" and "Specifying a Message Notifying Users That Wii Remote Transmissions Have Terminated." |
| | | 8 | Updated "Checking the Number of Free inodes and Amount of Free Memory Using NANDCheck[Async]" and "Notification When the Number of inodes or the Amount of Free Memory Is Insufficient." |
| | | | Changed the rank of "Handling Corrupted Files." |
| | | | Updated "Handling Corrupted Wii System Memory." |
| | | 9 | Updated "Memory Card Menu in Application." |
| | | | Updated "Note for Using CARDFastOpen Function" and changed the title to "Limit on Accessible Memory Card Files." |
| | | 10 | Updated "Wii Console RESET" and "Wii Power Button." |
| 0.97 | 2006/09/07 | 2 | Updated "Boot Caching". |
| | | 4.4 | Added "Prohibition on the Modification of the Audio Playback Frequency within an Application. |
| | | 6 | Added description of Wii console setting values when using a 16:9 aspect |

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|         |               |                  | ratio. |
|         |               | 7 | Added a note that the screen for describing how to wear the strap is currently being studied. |
|         |               |   | Added the section "Prohibition on the Use of the Origin Reset Command for the Analog Input of the Extension Controller". |
|         |               |   | Updated notes regarding message displayed when reading or writing to Wii Remote memory. |
|         |               |   | Added the sections "Handling Audio Cutoff of the Speaker Due to Connection of an External Extension Controller" and "Handling Audio Cutoff of the Speaker Due to Packet Loss." |
|         |               | 8 | Standardized terminology to use the term "Wii system memory" (old term: Wii console internal flash memory). |
|         |               |   | Deleted "Free Space Check" (the old 8.4). |
|         |               |   | Updated sections 8.1, 8.2, 8.3, 8.4, 8.5, and 8.8. |
|         |               |   | Added new sections from 8.9 to 8.15. |
|         |               | 10 | Updated the names of documents being referenced. |
|         |               |    | Added sections 10.2 and 10.6. |
|         |               |    | Changed the title of section 10.5. |
| 0.96 | 2006/08/24 | 2.17 | Deleted the (tentative) appellation for Boot Caching. |
|      |            | 6.17 | Added section on Support for 4:3 Aspect Ratio. |
|      |            | 7.2.4 | Added indication that the pointer halt functionality is not currently available in the KPAD library. |
|      |            | 7.2 | Added sections on Wii Remote memory (7.2.5 to 7.2.9) and on the speaker (7.2.10 and 7.2.11). |
| 0.95 | 2006/08/09 | 2.17 | Added section on "Boot Caching (tentative)." |
|      |            | 4 | Reorganized the entire chapter. |
|      |            | 7.1.3 | Changed the title "Warning Message of Moving Controllers" to "Explanatory Message for Strap Use," and upgraded the level of importance to "Required." |
|      |            | 8.9 | Added section on "Data Unit for Users." |
| 0.94 | 2006/07/21 |     | Initial version. |

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