ABCDEFGHIJ

Chapter 10

Fonts and Arcade Games

In this chapter, you'll learn about:

- ◆ **Fonts**
- ◆ **Font characteristics**
- ◆ **Font legibility**
- ◆ **Common font formats**
- ◆ **Platform-specific font support**
- ◆ **General rules for using fonts in arcade games**
- ◆ **Using fonts in arcade games**

No discussion of arcade game graphics design would be complete without covering at least some aspects of fonts. The purpose of this chapter is to serve as a primer on fonts and their correct use in arcade games.

What are Fonts?

Fonts (also called typefaces) are sets of letters, numbers, and other special symbols that share a particular style and appearance. Fonts play an important role in arcade game graphics design. They can help give a game character or reinforce it and also serve various utility roles. Without them, arcade games would not be able to display essential information such as game help, score and life indicators, game titles, or even game credits!

All fonts are composed of basic elements called *characters*. Characters are the letters and numbers we see and use every day for our written communication. Almost every font in use today also has a unique name associated with it (i.e., New York, Times, etc.) as well as a description of its appearance (i.e., Futura, Bold, Condensed, etc.). We use these items to help us manage and specify fonts in the game artwork we design.

Font Characteristics

Several characteristics describe how fonts appear on the screen. These include:

■ Serifs
■ Sans serifs
■ Monospaced
■ Proportional
■ Bitmapped
■ Scaleable

Serifs

Serifs are the small stems that accent the main *strokes*, or lines, that make up each character in a particular font. For example, in Figure 10-1, the letter T is set in a font called Times New Roman and has two horizontal serifs (at the bottom) and two vertical serifs (at the top).

This is a serif font

FIGURE 10-1: Serif Font Example

Serif fonts are useful for any game text that requires a formal or serious treatment such as in a title or logo. This ability to convey authority is one of the reasons why serif fonts are so popular with newspapers and magazines.

Sans Serifs

Sans serif fonts are the exact opposites of serif fonts. That is, they are fonts whose characters do not contain any serifs.

This is a sans-serif font

FIGURE 10-2: Sans Serif Font Example

Compared to serif fonts, sans serif fonts are better suited for games that don't require a serious creative treatment. In addition, sans serif fonts also tend to be easier to read than serif fonts, particularly on computer screens where their simple construction allows them to be easily seen at relatively low screen resolutions. This makes them very useful in arcade games for displaying all sorts of game-related information.

Monospaced

Fonts that are *monospaced* have an equal amount of horizontal space between each character.

The Quick Brown Fox

FIGURE 10-3: Monospaced Font Example

Monospaced fonts are commonly used for displaying information that must line up on-screen in a particular way. Examples of where this might occur include source code or a game's high score table. However, they are not very good for displaying large amounts of closely connected text such as is commonly found in game help screens and on-screen instructions. This is because each character in a monospaced font is surrounded by a fixed amount of white space which has the effect of making individual characters difficult to discern when many words are displayed on the screen at once.

NOTE: Most DOS fonts are of the monospaced variety.

Proportional

In fonts that are *proportional*, each character is given only as much horizontal space as it needs. For example, in a proportional font the letter "I" won't take up as much space as the letter "W" does.

The Quick Brown Fox

FIGURE 10-4: Proportional Font Example

Incidentally, proportional fonts are very popular for text-heavy applications because their characters are easy to distinguish from each other.

NOTE: Most Windows, Linux (using X Windows), Java, and Macintosh fonts are of the proportional variety.

Bitmapped

Bitmapped fonts are fonts whose characters are composed of individual dots and have a fixed size. Because of this, they are only useful at a particular resolution and can't be resized without seriously affecting their overall quality.

Think Different
Think Different
Think Different

FIGURE 10-5: Bitmapped Font Example

Bitmapped fonts were once quite common on computers but have since fallen into disuse due to their inability to change size easily without diminishing their quality. In addition, they are less flexible than other types of fonts since an entirely new bitmapped font set is required for every change in size.

NOTE: Many character-oriented operating systems, such as DOS and Linux, use bitmapped fonts for displaying text information. In addition, both Windows and the Macintosh also use bitmapped fonts for a variety of system-related purposes.

Scaleable

A *scaleable font*, unlike a bitmapped font, is defined mathematically and can be rendered at virtually any size without diminishing its quality or requiring a separate font set.

Think Different
Think Different
Think Different

FIGURE 10-6: Scaleable Font Example

Compared to bitmapped fonts, scaleable fonts can easily be resized and manipulated without the need for additional character sets and without loss of quality.

NOTE: All modern operating systems such as Windows, Linux, and the Macintosh use scaleable fonts (i.e., TrueType) to display text on-screen.

Font Legibility

To be effective in conveying its message in a game, a font must be *legible*, or easy to read and distinguish on-screen. Several properties can influence a font's legibility. These are:

- Face
- Style
- Size
- Aliased
- Anti-aliased
- Color
- Weight
- Leading
- Kerning
- Tracking

Face

A font face is a means of specifying a particular font design. Essentially, all fonts offer one of two faces: *decorative* and *non-decorative*.

Decorative fonts are fonts that exhibit some sort of artistic design or theme. For example, a decorative font face called Handwriting renders text as if it were drawn in someone's personal handwriting.

FIGURE 10-7: Decorative Font Example

Non-decorative fonts are the normal, unadorned fonts we see and use every day. Most serif and sans serif fonts fall into this category.

Decorative fonts are very useful for livening up the display of textual information. However, they are also notorious for being difficult to read. The extent of this problem depends on the degree of the decoration, the screen resolution, and size of the font. Therefore, be very careful when using them in your games.

Style

Fonts can use a variety of different styles to convey certain meanings and emotions in text. For example, you can use bold fonts to emphasize the importance of certain words. Similarly, fonts that are italicized are often used to emphasize words or to mark certain textual items such as a quote or a phrase.

FIGURE 10-8: Example Font Styles

With few exceptions, the font styles shown in Figure 10-8 can be applied at the same time, although this isn't recommended, especially if you want to keep your text legible.

Size

Fonts are usually measured in units called *points*. A point is roughly equivalent to 1/72 of an inch. Font size is determined by measuring from the bottom of the font's lowest character (descender) to the top of its tallest character (ascender), as shown in Figure 10-9.
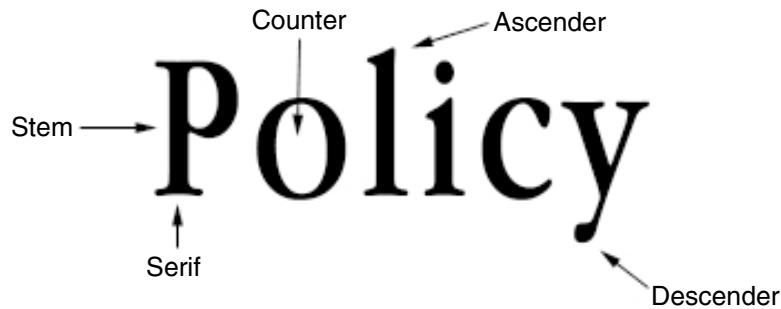
FIGURE 10-9: Font Element Diagram

FIGURE 10-10: Examples of Different Font Sizes

This scheme causes some fonts to sometimes appear larger than others do even if they are the same point size. For example, compare 12-point Times with 12-point Helvetica. Notice how much larger the text rendered in Helvetica seems.

As you might expect, a font's legibility is directly proportional to its size. As a general rule, larger fonts are more legible and therefore easier to read than smaller fonts regardless of the current screen resolution.

Table 10-1 compares the legibility of different fonts when used in arcade games.

TABLE 10-1: Font Legibility and Size in Arcade Games

Font Size	Comments
Less than 8 point	Virtually unreadable except at very high screen resolutions and then only useful for icons or captions.
8-12 point	Passable for most types of game text.
12-18 point	Easy to read on-screen. Excellent for game text.

Font Size	Comments
18-24 point	Easy to read on-screen. Excellent for game titles and game text.
24-36 point	Very easy to read on-screen. Excellent for displaying game titles and logos.
36-48 point	Very easy to read on-screen. Excellent for game titles.
Greater than 48 point	Very easy to read on-screen but of limited use due to the large size.

NOTE: A font's face, style, and the current screen resolution can all influence legibility. For example, a font displayed at a resolution of 640x480 will be more legible at the same point size than a font displayed at a resolution of 320x240.

Aliased

If you recall our discussion in Chapter 2, aliasing is the undesirable distortion of a graphic image due to insufficient screen resolution. As a result, fonts that are *aliased* appear blocky and coarse when displayed on-screen.

Aliased

FIGURE 10-11: Aliased Font Example

Aliased fonts are quite common on older systems, particularly those that don't use a graphical, windowing operating system, i.e., DOS, or for system display functions such as menus and dialog boxes.

Anti-Aliased

Fonts that are *anti-aliased* use shaded pixels around their edges to reduce or eliminate the effects of aliasing as they are displayed on-screen. This makes such fonts look much more attractive when compared to aliased fonts. Notice how much smoother the text in Figure 10-12 seems when compared to the text in Figure 10-11.

Anti-Aliased

FIGURE 10-12: Anti-Aliased Font Example

Most modern computers support anti-aliased fonts on their displays. For example, Macintosh systems support anti-aliased fonts from both the *Adobe Type Manager* program and the Appearance Control Panel while Windows systems support anti-aliased fonts via the Font Smoothing option in its Display Properties Control Panel.

However, it's important to understand that due to resolution constraints, anti-aliasing won't always improve the quality and readability of a font. In fact, sometimes it can even make the font less legible. In general, anti-aliasing produces better results as the font gets larger.

Table 10-2 provides some guidelines of when to use anti-aliasing on your fonts in a game.

TABLE 10-2: Font Anti-Aliasing Usage Guidelines

Font Size	Comments
Less than 8 point	Virtually unreadable when anti-aliased. Do not anti-alias at these sizes.
8-12 point	Difficult to read but passable for most types of game text when anti-aliased.
12-18 point	Easy to read on-screen. Produces good results when anti-aliased.
Greater than 24 point	Very easy to read on-screen. Produces excellent results when anti-aliased.

Color

Color looks at the overall aesthetic quality of a particular font. A font with *perfect color* is a font that has good spacing between characters, a good design, and proper character balance (i.e., one letter looking too dark or light when compared to one another).

Gaudy fonts (i.e., those that are excessively decorative) are considered to have poor font color. Poor font color can affect how good a font looks as well as its legibility on-screen.

Figure 10-13 compares font color between two different fonts. In this example, the font at top has relatively poor font color while the font at the bottom has a good font color. Can you see the difference yourself?

FIGURE 10-13: Font Color Comparison

Weight

A font's *weight* is a measurement of the vertical thickness of the individual characters in a font. Font weight is specified and determined according to several grades. These include extra-light, light, book, medium, bold, extra bold, and black. Fonts get darker and heavier in appearance as their weight increases. It is important to point out that not all fonts support all of these different weights.
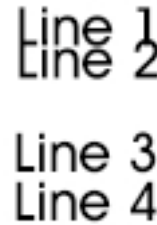
FIGURE 10-14: Font Weight Example

Leading

Leading is a measurement of the vertical space between lines of characters. Leading can be used to adjust the color of lines of text. Lines with too little leading can appear cramped and crowded, while lines with too much leading can appear too loose and open.

Unfortunately, many game designers fail to take leading into account when they place text on the screen. Poor leading can make text difficult to find and read when displaying important game-related information.

Figure 10-15 shows an example of how leading can affect the color of a line of text. In this example, Lines 1 and 2 have too little leading while Lines 3 and 4 are just right.

FIGURE 10-15: Leading Example

NOTE: Many bitmapped system fonts also have poor font leading characteristics.

Kerning

Kerning is a method of reducing the space allotted to one or both sides of a character to make it fit more comfortably between its neighbors. Kerning is frequently used to adjust and improve the color of a particular font.

Figure 10-16 shows an example of how kerning alters character spacing and the appearance of text.

FIGURE 10-16: Kerning Example

Tracking

Tracking is a measurement of the overall letter spacing in a line of text. Adjusting the tracking of a line can also improve its color and its legibility.

Common Font Formats

Fonts are available in a number of different formats. These formats dictate both their features and the platforms with which they are compatible. The most common font formats used in arcade game graphics are organized in these categories:

Bitmapped:
- ROM fonts
- ZSoft fonts
- GEM fonts
- Fastgraph fonts
- Custom game fonts

Scaleable:
- Borland Stroked fonts
- TrueType fonts
- System fonts

ROM Fonts

Native Platform(s): DOS, Linux, and the Macintosh

File Extension(s): N/A

ROM fonts are bitmapped fonts that are built into your computer's ROM (Read-Only Memory). Because they come built-in, ROM fonts do not require the installation of additional font sets in order to be used.

FIGURE 10-17: ROM Font Example

However, despite these advantages, ROM fonts have a number of disadvantages, including:

- **They're monospaced**—All ROM fonts are monospaced and were designed to only fit within a predefined pixel grid. This gives them poor overall color and affects their on-screen legibility.
- **They're bitmapped**—ROM fonts are bitmapped, and as such cannot be easily resized.

- **They have poor leading**—ROM fonts weren't designed to support flexible character leading. This makes them less than ideal for displaying large amounts of text.

- **They have fixed kerning**—ROM fonts have fixed character spacing. This causes them to produce cramped lines of text when displaying large amounts of textual information.

- **They support limited faces**—Most ROM fonts support only one font face. This makes them inflexible for many purposes, especially when you want to produce a particular look in a game.

- **They support limited styles**—Most ROM fonts offer only one display style and do not support bolding, italics, or underlining. This makes them useless for emphasizing certain textual elements.

ROM fonts are traditionally used by character-based operating systems such as DOS and Linux, but they can also be seen on the Macintosh and Windows platforms as well.

At one time, using ROM fonts in arcade games was the rule and not the exception, and these fonts were frequently used to display text on help screens, label menu options, and print various game status information. However, given improvements in computer capabilities and display technologies over the years, this situation no longer applies. Simply put, using ROM fonts in your arcade games makes them looks crude and amateurish. Therefore, avoid them, as there are many other alternatives available.

TABLE 10-3: ROM Font Characteristics

Platform	Supported Sizes (points or pixels)	Proportional	Adjustable Leading	Adjustable Kerning	Adjustable Faces	Adjustable Styles
DOS	8x8 or 8x16 pixels				✓*	
Windows	N/A	N/A	N/A	N/A	N/A	N/A
Linux	8x8 or 8x16 pixels					
Macintosh	9, 10, 12, 14, 18, 24 points				✓*	✓

* Denotes that these platforms can replace the default system font with another in certain situations.

NOTE: You can alter the appearance of ROM fonts in certain situations. For example, using a ROM font editing program, you can alter the appearance of DOS's ROM character set.

ZSoft Fonts

Native Platform(s): DOS

File Extension(s): .FNT, .fnt

ZSoft originally introduced this bitmapped font format with the introduction of its popular *PC Paintbrush* painting program during the mid- to late 1980s. Owing to the popularity of the *PC Paintbrush* program, these fonts soon became an unofficial DOS font standard and were widely used in PC-based graphics and desktop publishing applications through the early 1990s. Therefore, you can still find large numbers of fonts available in this format.

As with all bitmapped fonts, ZSoft fonts can't be resized without losing their display quality. In addition, ZSoft fonts are typically monochrome but can use multiple colors in certain situations.
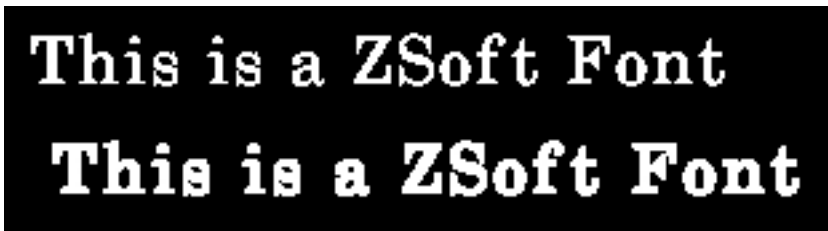

FIGURE 10-18: ZSoft Font Example

TABLE 10-4: ZSoft Font Characteristics

Versions	Proportional	Adjustable Leading	Adjustable Kerning	Adjustable Faces	Adjustable Styles	Adjustable Sizes
N/A	✓+				✓	

+   Denotes that they can be monospaced as well depending on how the font was designed.

> **NOTE:**   *Improces*, a painting program mentioned in Chapter 6, is compatible with ZSoft fonts.

GEM Fonts

Native Platform(s): DOS

File Extension(s): .FNT, .fnt, .GFT, .gft

The GEM font format was first introduced in the mid-1980s with the advent of Digital Research, Inc.'s GEM (Graphics Environment Manager) operating system shell. Although GEM never took off as a desktop interface on the PC platform, it did enjoy significant commercial success in desktop publishing circles when it

became the interface for the popular *Ventura* desktop publishing system. Because of this legacy, you can still find large numbers of GEM-compatible fonts from various public domain, shareware, and commercial sources.

GEM fonts are normally bitmapped. As such, they suffer from the same issues that plague all bitmapped fonts. However, some later implementations of the GEM font format were actually scaleable but never caught on in any significant way. GEM fonts are also monochrome and can't support more than two colors per character.

NOTE: GEM fonts were also quite common on the Atari ST platform. However, you can't use these fonts without first converting them since Atari GEM fonts are encoded somewhat differently than those used on PC-compatible systems.

FIGURE 10-19: GEM Font Example

TABLE 10-5: GEM Font Characteristics

Versions	Proportional	Adjustable Leading	Adjustable Kerning	Adjustable Faces	Adjustable Styles	Adjustable Sizes
Intel	✓+	✓*	✓*		✓	
Motorola (Atari)	✓+	✓*	✓*		✓	

* Denotes that kerning and leading can be adjusted depending on the capabilities of the software used.
+ Denotes that they can be monospaced, as well, depending on how the font was designed.

NOTE: *NeoPaint for DOS*, a painting program mentioned in Chapter 6 and included on the book's accompanying CD-ROM, is compatible with GEM fonts.

Fastgraph Fonts

Native Platform(s): DOS
File Extension(s): .FGF, .fgf

The Fastgraph font format is a proprietary, bitmapped font format developed by Ted Gruber Software for use with its *Fastgraph for DOS* graphics programming library.

Although a bitmapped font, the Fastgraph font format can support a variety of programmed color and spacing effects.

TABLE 10-6: Fastgraph Font Characteristics

Versions	Proportional	Adjustable Leading	Adjustable Kerning	Adjustable Faces	Adjustable Styles	Adjustable Sizes
N/A	✓+	✓*	✓*			

*   Denotes that kerning and leading can be adjusted depending on the capabilities of the software used.
+   Denotes that they can be monospaced, as well, depending on how the font was designed.

Custom Game Fonts

Native Platform(s): DOS, Windows 3.1, 95, 98, NT 4.0, and 2000, Linux, Macintosh, and Java

File Extension(s): N/A

We've all seen arcade games at one time or another that featured decorative fonts that appeared as if they were three-dimensional or metallic, etc. Well, these fonts aren't really fonts at all. Rather, they are hand-drawn bitmapped images that are used as fonts. Through special programming, these bitmaps can be used to display text and other information in an arcade game screen.

Since they are bitmaps, custom game fonts can assume virtually any size, shape, color, or style you can dream up. This makes them particularly effective in enhancing the visual look and feel of an arcade game.

On the other hand, because they're bitmaps, custom game fonts can't be easily resized nor do they offer traditional font amenities like adjustable leading or kerning. Furthermore, they require more time and effort to implement than other font formats because they usually have to be designed completely from scratch. Finally, they require more preparation and work from the programmer's standpoint since the programmer must devise routines and mechanisms to properly handle their display and integration with the game.

FIGURE 10-20:
Custom Game Font Example

TABLE 10-7: Custom Bitmap Font Characteristics

Versions	Proportional	Adjustable Leading	Adjustable Kerning	Adjustable Faces	Adjustable Styles	Adjustable Sizes
N/A						

> **NOTE:** Custom bitmapped font sizes tend to be specified in pixels rather than points.

> **NOTE:** You can create custom game fonts with any painting program or image editor mentioned in Chapter 6.

Borland Stroked Fonts

Native Platform(s): DOS

File Extension(s): .CHR, .chr

This scaleable font format made its debut with Borland's Turbo Pascal programming language during the late 1980s. A monochrome-only font format, Borland Stroked fonts remained in use through the mid-1990s until the advent of the Windows platform, which abandoned this technology in favor of other scaleable font technologies like TrueType.

FIGURE 10-21: Borland Stroked Font Example

TABLE 10-8: Borland Stroked Font Characteristics

Versions	Proportional	Adjustable Leading	Adjustable Kerning	Adjustable Faces	Adjustable Styles	Adjustable Sizes
N/A	✓*	✓*	✓*	✓	✓	✓

* Denotes that kerning and leading can be adjusted depending on the capabilities of the software used.

> **NOTE:** *Improces*, a painting program mentioned in Chapter 6, is compatible with Borland Stroked fonts.

TrueType Fonts

Native Platform(s): Windows 3.1, 95, 98, NT 4.0, and 2000, Linux, Macintosh, and Java

File Extension(s): .TTF, .ttf

Apple originally developed the TrueType font format in 1990 as a means of challenging Adobe (once the leading font developer and technology supplier) in the hot desktop publishing market. The technology made its debut on the Macintosh platform and the technology was later supplied to Microsoft, which in 1991 introduced TrueType on the PC with the release of Windows 3.1.

TrueType fonts are inherently scaleable. Therefore, they enjoy all of the advantages that this provides, including the ability to scale text to any size without the loss of quality. As designed, TrueType fonts are monochromatic. This allows them to be used for printing as well as for screen display.

TrueType fonts are the standard font formats for both Windows and Macintosh systems and virtually all graphics programs on these platforms support them. Until recently, TrueType fonts weren't compatible with Linux but recent implementations of that operating system have made their use possible on that platform as well.

Despite their popularity, you can't transfer TrueType fonts from one platform to another without first converting them. This is due to platform-specific font-encoding differences. Fortunately, this is relatively easy to do with the proper software.

TABLE 10-9: TrueType Font Characteristics

Versions	Proportional	Adjustable Leading	Adjustable Kerning	Adjustable Faces	Adjustable Styles	Adjustable Sizes
Windows	✓+	✓*	✓*	✓	✓	✓
Macintosh	✓+	✓*	✓*	✓	✓	✓

*   Denotes that kerning and leading can be adjusted depending on the capabilities of the software used.
+   Denotes that they can be monospaced, as well, depending on how the font was designed.

System Fonts

Native Platform(s): DOS, Windows 3.1, 95, 98, NT 4.0, and 2000, Linux, Macintosh, and Java

File Extension(s): N/A

System fonts are those fonts that come bundled with a particular operating system or computer platform. They don't come built-in like ROM fonts are but are the default fonts supported by a particular system.

With the exception of DOS and character-based Linux implementations, system fonts are almost exclusively TrueType, although some are of the bitmapped variety as well.

Table 10-10 shows the different default fonts that come with each platform "out-of-the-box."

TABLE 10-10: Default System Fonts on Different Platforms

Platform	Default System Font Faces
DOS	8x8 and 8x16 ROM BIOS font
Windows	Arial, Courier New, FixedSys, Modern, MS-Serif, MS-Sans Serif, Tahoma, Terminal, Times New Roman
Macintosh	Times, Charcoal*, Chicago, Courier, Gadget*, Geneva, Helvetica, Monaco, Palatino, New York, Textile*
Linux	Fonts vary depending on Linux distribution but they typically contain font faces similar to the Courier, Times New Roman, Geneva, and Helvetica varieties.
Java	Courier, Helvetica, Times New Roman, ZapfDingbats, Dialog (a slightly modified form of Helvetica)

*   Denotes fonts included with newer MacOS versions.

The primary advantage offered by system fonts is that they are always available on a given platform. This allows you to specify them in your arcade games without the fear of them not being available on a user's system. Therefore, it's safe to use them whenever you need to display non-graphic text in your game.

Platform-Specific Font Support

As I mentioned earlier, although some font formats are available with multiple platforms, not all of these fonts can be used without some sort of conversion process.

TABLE 10-11: Summary of Font Support

Font Format	DOS	Windows	Linux	Macintosh	Notes
ROM BIOS	✓	✓	✓	✓	
ZSoft	✓				
GEM	✓	✓			Be wary of GEM fonts coming from the Atari ST platform, as they will need to be converted to the Intel format before they can be used.
FastGraph	✓				
Custom bitmapped	✓	✓	✓	✓	

Font Format	DOS	Windows	Linux	Macintosh	Notes
Borland Stroked	✓				
TrueType		✓	✓	✓	You can import many TrueType fonts into DOS applications using utilities like *TT2GEM* and export them as GEM format fonts.

NOTE: To help make the process of converting fonts between formats and platforms easier, several font conversion utilities are available on the book's accompanying CD-ROM. Please refer to Appendix B for more details on these programs.

General Rules for Using Fonts in Arcade Games

Now that you have a grasp on the fundamentals of fonts and the various font formats, you need to understand the fundamental rules of using fonts in your games. Most designers will tell you that there's a right way to use fonts and a wrong way to use them. These guidelines are provided to help you to learn the right way.

- **Always emphasize font legibility over font aesthetics**—The primary purpose of fonts in a game (or any other application for that matter) is to display textual information in a consistent and legible manner—nothing more, nothing less. Therefore, your primary concern should be choosing fonts for their legibility rather than their aesthetic value. Of course, you are encouraged to look for fonts that are attractive as well as readable, but legibility should always be your most important consideration in selecting a font.

- **Avoid custom bitmap fonts unless absolutely necessary**—For all of their flexibility, simply put, creating and using custom bitmap fonts is a pain—a pain for you and a pain for the programmer. In the past, custom bitmap fonts offered designers flexibility and visual characteristics that many existing font technologies didn't. However, today, this is no longer true. Modern font formats such as TrueType now support so many different faces and styles that there is really no practical reason to rely on custom bitmap fonts except for very specialized purposes. Therefore, avoid using them as much as possible in your game artwork.

- **Avoid displaying words entirely in uppercase**—Text displayed exclusively as uppercase type (i.e., all capitals) is significantly harder to read than mixed type (i.e., the combination of lower- and uppercase characters). This is because uppercase text tends to lack the unique shapes that users need to help them distinguish between letters and words. Also, avoid capitalizing too many letters in your text. This can potentially cause unnecessary user

confusion. When in doubt, only capitalize the first letter in each line of text and the first letter of proper nouns such as the names of people, places, or things.

- **Avoid overly decorative fonts for body text**—Overly decorative fonts can be difficult to read on-screen for the same reasons that most serif fonts are. Also, be careful when using them for any text less than 16 points in size.

- **Avoid overusing bold fonts**—Bolding text is used to give a word or phrase emphasis. However, bold fonts tend to be difficult to read when used over large amounts of copy. This is due to the fact that bolded fonts have thicker strokes than normal text. This additional stroke thickness, particularly at lower screen resolutions, can dramatically affect the amount of space that's available inside letters like "o," "e," "d," and "g." Users depend on these spaces to recognize words. As this intra-letter spacing gets smaller, the text can become harder and harder to recognize.

- **Avoid overusing italic fonts**—Italics are meant to provide words and phrases with a "soft" emphasis. However, italic text, when used in large amounts, can disrupt how a user reads information presented on the screen. Under normal circumstances, italics confuse the reader and slows down the pace at which they can decipher text. This explains why italics are effective for emphasizing certain words or phrases. Yet, when used in large amounts, this characteristic of italics can also make text more difficult to read and the information you're trying to convey more difficult to remember.

- **Avoid overusing underlined fonts**—Underlining is commonly used interchangeably with italics in order to emphasize certain words or phrases in a subtle manner. Unfortunately, underlining doesn't always translate very well to the computer screen due to the limitation of available screen resolution. In addition, when used on blocks of text with tight leading, underlining can drastically affect legibility. Therefore, use underlining sparingly or, better yet, not at all.

- **Avoid using anti-aliased fonts for small text**—Anti-aliased fonts are very effective for displaying large text items, but due to resolution limitations they do not produce very readable text at very small text sizes. See Table 10-2 for more details.

- **Make use of kerning and tracking as much as possible**—Letter and line spacing can have a significant impact in the effectiveness of your message, especially when rendered on-screen where you have to contend with limited screen resolution. Kerning tends to become more important as font size increases. To minimize legibility issues, keep kerning narrower at large font sizes and wider at small font sizes. Similarly, tracking can make text look too cramped at small font sizes and too open at large font sizes. Adjust it to suit your circumstances.

- **Pay attention to line spacing**—Line spacing, or leading, can be a very effective aid in drawing the user's eye from word to word. Very narrow line spacing can cause the user to return to the same line of text. Meanwhile, line spacing that is too wide can slow the user down and force them to look for the start of the next line of text. Although line spacing will vary according to the font style and size you choose, a good rule of thumb is to add two to four points between the lowest descender and highest ascender of a given line of text. So, for example, if you're using a 12-point font, set the leading to 14.
- **Use centered text carefully**—Centered text can be very effective for focusing the user's attention on certain text elements such as titles and headlines. However, if used too much or used improperly, centered text can have a detrimental effect on text readability. In addition, when used too much in a game, centered text can appear amateurish to the player.
- **Use sans serif fonts for game text**—Sans serif fonts are inherently easier to read on-screen than text that uses serif fonts. This is because the individual character serifs can blend together due to screen resolution limitations. Serif fonts are fine to use for headlines and the like because such text usually tends to be large and well spaced.
- **Use sans serif fonts for casual text**—Due to the simple construction of their characters, sans serif fonts are ideally suited for presenting a casual, laid-back feeling on-screen. Use them for any text that doesn't require an authoritative air.
- **Use serif fonts for elegant or serious text**—Serif fonts are best used for text that requires a sense of elegance.

Using Fonts in Arcade Games

Fonts, when properly used, can liven up and enhance an arcade game's graphics in addition to their primary role of displaying important game-related information. In arcade games, fonts are usually relegated to these three areas:

- Game titles
- Body text
- Status indicators

Game Titles

Game titles consist of any words or phrases used to describe and label information displayed on a given game screen.

For our purposes, any text greater than 16 points in size can be considered a game title. Game titles are usually between one and six words in length.

Because they serve to announce important information on a screen, game titles should be rendered in a font that is both legible and projects a noticeable presence. This means that the font used should dominate whatever else is displayed on-screen. Simply put, a game title is ineffective if the other text elements displayed "crowd out" the title's font.

Game titles can be rendered in either serif or san serif fonts. Just remember the rules described in the previous section.

FIGURE 10-22: Game Title Example

Body Text

Body text, or game text, consists of any words or phrases used to convey information on a given game screen.

Body text can range from one sentence to one page in length. For our purposes, any text less than 16 points in size can be considered body text.

As the purpose of body text is to present information to the user, body text should stress legibility over everything else, including style.

FIGURE 10-23: Body Text Example

Status Indicators

Status indicators are the words and phrases used to indicate game status on a given game screen. Examples of status indicators include score displays, life displays, level displays, health displays, and so on. Status indicators are usually no longer than two or three words. However, unlike either titles or body text, status indicators are not limited in size. They can be displayed in any font size or style as long as the information is legible.
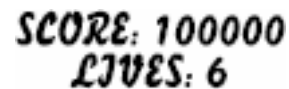

FIGURE 10-24: Status Indicator Example

Table 10-12 provides some style guidelines for fonts in arcade games.

TABLE 10-12: Arcade Game Font Style Guide

Arcade Game Text	Bold	Italic	Size	Proportional	Monospaced	Face	Anti-aliased
Game titles	✓	✓	Greater than 16 points	✓	✓	Decorative	✓
Body text			Less than 16 points		✓	Non-decorative*	
Status indicators	✓	✓	Any size	✓	✓	Non-decorative*	

* Depends on the legibility of the font being used.

- **Game titles**—Title text may be bolded or italicized because their size tends to minimize the issue of screen resolution. Title text works best when it is displayed using proportional and anti-aliased fonts.
- **Body text**—Body text shouldn't be bolded or italicized due to screen resolution limitations. Although body text can be proportional, monospaced fonts offer the best legibility for most types of body text, especially when lots of text is involved. It's also not a good idea to anti-alias body text as legibility may be affected. When in doubt, refer to Table 10-1 and experiment with the values shown there.
- **Status indicators**—Status indicators have very few stylistic restrictions on them. Pretty much anything can go as long as legibility isn't compromised by the font face and style used.

Arcade Game Font Recommendations

Every font format has its place in arcade game graphics design. Use the information presented in Tables 10-13 and 10-14 to help determine which font formats and font styles to use in your own game projects.

TABLE 10-13: Font Format Game Font Recommendations

Font Format	Game Titles	Body Text	Status Indicators
ROM BIOS		✓	✓
ZSoft	✓	✓	✓
GEM	✓	✓	✓
Fastgraph	✓	✓	✓
Custom Bitmapped	✓	✓	✓
Borland Stroked	✓		
TrueType	✓	✓	✓

- **ROM fonts**—These fonts are excellent for body text but are virtually useless for title text. Although they can be used for status indicators, this isn't recommended due to their overall inflexibility with regard to sizing and style.

- **ZSoft fonts**—As a bitmapped font, ZSoft fonts work well for all arcade game text applications. Just be aware of their limitations with regard to size, spacing, and quality (anti-aliasing).

- **GEM fonts**—GEM fonts also work well for all arcade text purposes. However, like ZSoft fonts, they tend to be limited in terms of size, spacing, and quality.

- **Fastgraph fonts**—Fastgraph fonts are useful for all arcade game text purposes. They suffer the same problems as ZSoft and GEM fonts but offer more flexibility due to their ability to control their spacing via software.

- **Custom bitmapped**—Custom bitmapped fonts can be used for any arcade game text application. They can be especially effective for titles. Just make sure that the fonts used are legible. However, be aware that the widespread availability of Windows and Macintosh TrueType fonts often negates their usefulness.

- **Borland Stroked fonts**—These fonts are useful for title text but not much else. Despite being scaleable, their quality and legibility is usually lacking at all but the largest sizes.

- **TrueType fonts**—TrueType fonts are the most flexible of all of the font formats mentioned here. They can be used to render any game text and should be used over the other font formats whenever possible.

Table 10-14 provides a list of recommended TrueType fonts to use in your game projects. The fonts listed here are available from a variety of sources. Some are commercial, some are pre-installed on most systems, but most are from freeware or shareware sources. In addition, the Internet offers one of the best selections of fonts. The supporting Web site for this book, `http://www.gamegfx.com` has a listing of some of the best sites for downloading fonts.

NOTE: Check on the legality of any font you download from the Internet. As it happens, many commercial fonts are repacked as being free or shareware when they are not.

TABLE 10-14: TrueType Game Font Recommendations

Common Font Face	Font Characteristics	Potential Use(s)	Availability	Comments
Ameila	Proportional, sans serif, decorative	Game titles, status indicators	Freeware or shareware	A good "computer terminal" style font. Useful for arcade games with futuristic themes.
Apple Garamond	Proportional, serif, non-decorative	Game titles, body text, status indicators	Commercial	The Apple "Think Different" font. Recommended for when you want to portray a sense of elegance and sophistication in your game while maintaining readability.
Arial	Proportional, sans serif, non-decorative	Game titles, body text, status indicators	Pre-installed	An excellent all-around arcade game font.
Arial Black	Proportional, sans serif, non-decorative	Titles, status indicators	Pre-installed	A particularly good font for rendering large titles.
BattleStar	Proportional, sans serif, decorative	Game titles	Freeware or shareware	A font patterned after the old *Battlestar Galactica* TV series. Useful for arcade games with futuristic themes.
Beatsville	Proportional, sans serif, decorative	Game titles, body text, status indicators	Freeware or shareware	An excellent font for retro- and cartoon-style arcade games.
Bedrock	Proportional, sans serif, decorative	Game titles, status indicators	Freeware or shareware	An excellent font for arcade games with prehistoric themes.
Broadway	Proportional, serif, decorative	Game titles, status indicators	Freeware or shareware	An interesting Art Deco styled font. Recommended when you want to portray a sense of nostalgia in an arcade game.

Common Font Face	Font Characteristics	Potential Use(s)	Availability	Comments
Bullet Holes	Proportional, sans serif, decorative	Game titles	Freeware or shareware	Interesting title font that's good for military-style shooters.
Carrkeys	Proportional, sans serif, decorative	Status indicators	Freeware or shareware	Very useful for rendering keyboard command keys.
Celtic	Proportional, serif, decorative	Titles, body text	Freeware or shareware	Recommended for all medieval-style arcade games.
Century Gothic	Proportional, sans serif, non-decorative	Game titles	Commercial, freeware, or shareware	An excellent font for creating easy-to-read yet sophisticated-looking titles.
Comic Sans MS	Proportional, sans serif, decorative	Game titles, status indicators	Installed by many Microsoft software products	Useful font for cartoon-style arcade games.
Courier New	Monospaced, serif, non-decorative	Game titles, body text, status indicators	Pre-installed	Useful font for retro-style arcade games because of its resemblance to terminal fonts used on old computers.
Franking Gothic	Proportional, sans serif, non-decorative	Game titles, status indicators	Commercial	An excellent all-purpose arcade game font.
Futura Light	Proportional, sans serif, non-decorative	Game titles	Commercial	An excellent font for creating easy-to-read yet sophisticated-looking arcade game titles.
Humanst521	Proportional, sans serif, non-decorative	Game titles, body text, status indicators	Commercial	An excellent font for creating easy-to-read yet sophisticated body text.
Joystix	Monospaced, sans serif, non-decorative	Body text, status indicators	Freeware or shareware	An excellent replica of a classic arcade game machine font. Very useful for retro-style arcade games.

Common Font Face	*Font Characteristics*	*Potential Use(s)*	*Availability*	*Comments*
Jurassic	Proportional, sans serif, decorative	Game titles, status indicators	Freeware or shareware	An excellent font for arcade games with prehistoric themes.
Mandarin	Proportional, serif, decorative	Game titles, body text, status indicators	Freeware or shareware	A great font for arcade games with oriental themes.
Old English	Proportional, serif, decorative	Game titles, status indicators	Freeware or shareware	Recommended for all medieval-style arcade games.
Serpentine	Proportional, sans serif, decorative	Game titles, body text, status indicators	Freeware or shareware	Useful for arcade games with futuristic themes.
Star Base Normal	Proportional, sans serif, decorative	Game titles	Freeware or shareware	A *Star Trek*-style font. Useful for arcade games with futuristic themes.
Stencil	Proportional, sans serif, decorative	Game titles, body text, status indicators	Freeware or shareware	Interesting title font for arcade games with military themes.
Times New Roman	Proportional, serif, non-decorative	Game titles, body text, status indicators	Pre-installed	Recommended when you want to portray a sense of elegance and sophistication while maintaining readability.
Toontime	Proportional, sans serif, decorative	Game titles, status indicators	Freeware or shareware	An excellent font for retro- and cartoon-style arcade games.
Verdana	Proportional, sans serif, non-decorative	Game titles, body text, status indicators	Installed by Microsoft Internet products	An excellent all-purpose arcade game font. This font was developed specifically for displaying readable text on the computer screen.

NOTE: Due to vast differences in font naming conventions, it is entirely possible for the same font to go under two or three different names.

NOTE: The book's accompanying CD-ROM contains a number of useful freeware and shareware fonts, including several of the fonts described in Table 10-14.