

Windows
Phone

Playing Sound
Effects in XNA



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Windows Phone 7 Jump Start
Microsoft Corporation

Agenda

Adding sounds to XNA games

Controlling sound playback


Creating looping sounds

Managing voices

Sound effects in Silverlight

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Adding Sounds to
XNA Games

Sound Playback

- The sound playback mechanism on the Windows Phone is similar to that on other XNA platforms
 - There is no support for XACT soundfields
 - There are fewer simultaneous voices available
- However, everything else is the same
 - Sound effects are added as content items, loaded at game start and then played

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Sounds as Content

- XNA uses a Content Manager to look after the resources used by a game
- Each content type has a “pipeline” of processors that bring it into the project and then package it for inclusion in the game distributable
- You don’t need to worry how this works
- You can write your own content library if you wish

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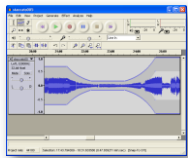
XNA Sound Types

- XACT sound fields
 - Can create composite sound effects
 - Only available on Xbox and Windows PC
- Sound effects
 - wav files held in memory for quick playback
- Background music
 - wma and mp3 files loaded and played
 - Managed as media (more on this later)

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Preparing Sounds

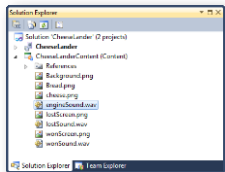


- A good tool for preparing sound files is Audacity
- It will also convert between mp3 and wav format
- You can download it for free from <http://audacity.sourceforge.net/>

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Adding Content

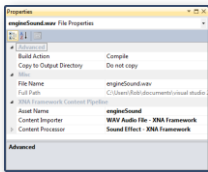


- The simplest way to add content is to drag and drop it into the solution
- Note that in XNA 4.0 the content is a separate project

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Content Properties



- The content Properties pane identifies the asset name and the importer to use

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SoundEffect variables

```
1. SoundEffect wonSound;  
2. SoundEffect lostSound;  
3. SoundEffect engineSound;
```

- These game member variables hold the sound effects for the "Cheese Lander" game
- They will be initialised with content when the game starts running
- The LoadContent method does this
- It is called automatically by XNA

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The LoadContent method

```
1. protected override void LoadContent()  
2. {  
3.     // Load the sound effects  
4.     wonSound = Content.Load<SoundEffect>("wonSound");  
5.     lostSound = Content.Load<SoundEffect>("lostSound");  
6.     engineSound = Content.Load<SoundEffect>("engineSound");  
7. }
```

- LoadContent is called when the game starts
- The game contains a Content Manager which manages game content (surprisingly)
- The Load method uses Generics to determine the required loader

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Simple Sound Playback

```
1. private void gameWon()  
2. {  
3.     wonSound.Play();  
4.     state = gameState.won;  
5. }
```

- The gameWon method is called if the player wins
- It plays the winning sound effect and updates the game state
- This is using the simple, immediate playback method

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Controlling Sound Playback

Complex Sound Playback

- Sometimes the sound playback is more complex
- For Cheese Lander I want to play the engine sound continuously when the “engine” is running
- I also want to vary the pitch of the sound as it plays
- To do this I need to use a SoundEffectInstance
- This is an object that serves as a handle to a playing sound

The SoundEffectInstance

```
engineInstance = engineSound.CreateInstance();
```

- When we call the Play method on a sound effect this is a “fire and forget” kind of sound playback
- To get more control over a sound we need to create an object that represents it
- A SoundEffect can be asked to create an object representing an instance of a sound being played by using the CreateInstance method

Playing Sounds

```
engineInstance.Play();  
...  
engineInstance.Pause();  
...  
engineInstance.Stop();
```

- The Play method on a SoundEffectInstance will start sound playback
- We can also call Pause and Stop to control the sound

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Controlling Volume

```
engineInstance.Volume = accelVector.Length() / volFactor;
```

- The Volume property lets you adjust the volume of a playing sound
- The range is from 0 to 1:
 - 0 no sound
 - +1 maximum volume

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Controlling Pitch

```
engineInstance.Pitch = accelVector.Length() / soundFactor;
```

- The Pitch property lets you adjust the pitch of a playing sound
- The range is from -1 to 1:
 - -1 octave low
 - 0 normal pitch
 - +1 octave high

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Controlling Position

```
engineInstance.Pan = cheesePan;
```

- The Pan property lets you adjust the pan position of a playing sound
- The range is from -1 to 1:
 - -1 hard left
 - 0 center
 - +1 right

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Sound Status

```
1. if (engineInstance.State == SoundState.Stopped)
2. {
3.     engineInstance.Play();
4. }
```

- The SoundEffectInstance exposes a property that gives the playing status
- This is updated when the sound stops playing
- The code above will play the sound again if it is stopped
- This is a primitive kind of looping

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Looping Sounds

Looping Sounds

```
engineInstance.IsLooped = true;
```

- I can get the looping effect by simply restarting playback from the SoundEffectInstance each time the game detects that it has stopped
- However, there is a much easier way of getting this effect
- I simply set the IsLooped property to true

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Cheese Lander


Demo

Demo 1: Sound Effect Control



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Managing Voices

Voice Limitations

- The Windows Phone device does not have as many sound channels as other XNA platforms
- You need to be careful that your program doesn't run out of voices when playing complex sounds
- The Play method on the SoundEffect class will return false if the sound could not be played

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Sounds in Silverlight

Silverlight and XNA

- You can use SoundEffectInstance in your Silverlight programs too
- We have already explored how to use XNA sounds in a Silverlight program:
 - Bring in the XNA.Framework library
 - Add the namespace
 - Call Framework.Update to keep things going

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Review

XNA sound playback only supports one voice at a time

Sound Effects are played by the Content Manager

mp3 files can be used as Sound Effects

The SoundEffectInstance class provides a handle to a sound

You can stop and start playing sounds

Both Silverlight and XNA use the same sound library

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Coming Up Next...


Using the touchscreen in an XNA game

Using the Guide for text input

Controlling media playback with XNA

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