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**APOLLO Pre-Production Milestone #4 Contents**

**October 23rd, 2009**

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# Product Data Sheet

The [**Product Data Sheet**](Production/Apollo%20Product%20Data%20Sheet.docx) has not been updated yet since our last Milestone drop. Marketing currently is updating the PDS as part of the Core Team Dashboard process. Once they have finished their pass, we will update the document with further Pillar definition.

# Apollo Vertical Slice Update

1. [**Vertical Slice Plan**](Design/Apollo%20Vertical%20Slice%20Plan%20V1.1.docx) - This document defines all gameplay systems that will be part of our Vertical Slice submission. This document also defines the expected level of fidelity that we are planning on achieving with each gameplay system.
2. [**Vertical Slice Walk-Through**](https://confluence/display/batman/Vertical+Slice+Quest+Walkthrough) - This section on Confluence walks you through the gameplay experience that you will experience with our Vertical Slice submission.

**WBG Senior Management Presentation Update**

We are going to be adding the following deliverables to our Vertical Slice plans:

* **Apollo - Arkham Asylum Comparison Video**
  + This video will show both games and allow Senior Management to see the distinct direction we are visually taking with Apollo and how we differentiate ourselves globally from the Arkham Asylum games
* **Vehicle Gameplay Level - 3rd Pass** 
  + Although we had already planned on taking this level to its 2nd pass, we're going take our automotive level to as high a fidelity state as we can to help show off our visual direction while also helping further define our vehicle gameplay.

These areas of concern came up in the last couple of days so our Vertical Slice Plan and Milestone Deliverables document do not reflect our final plans for these deliverables yet. We will update the DAG once we have these updated plans in place.

# Production Update

## Schedule

1. [**Apollo Vertical Slice Schedule**](Production/Apollo%20Vertical%20Slice%20Schedule.xlsx) - This document provides task/goal information on a per-resource basis for the entire Apollo team.
2. [**Apollo Milestone Deliverables Schedule**](Production/Apollo%20Milestone%20Schedule%20PPM4.docx) - This document contains all the milestone deliverables through Pre-Production for the Vertical Slice.

## Strike Team Scheduling Process

With the combination of a large pre-production team and several new major systems and gameplay features being built from the ground up, it has been important to us to make sure that we have a scheduling process that allows us to remain diligent with such a large team but also allows us strong flexibility to adapt as course corrections are needed and keep our efficiency in an optimal state.

Here is a break-down of how we accomplish our scheduling process:

We established a Vertical Slide Plan, an Apollo Pre-Production Schedule and the Milestone Deliverables list at the beginning of Pre-Production. On a weekly, sometimes daily, basis, we continue to revise, define and update our plan, schedule and list and we include these updated documents with every Milestone.

At the beginning of each milestone, using our Vertical Slice Plan, Pre-Production Schedule and Milestone Deliverables list as a guideline, the Core Leads create detailed goals, requirements, and sign-offs for the next milestone’s deliverables. This can include any smaller internal goals that we don’t plan on including in the milestone drop. At this point, Strike Team and/or Department Leads discuss these goals with the team members and create detailed tasks and estimates in JIRA for the next steps towards those goals. Depending on the goal, these detailed tasks might be definable all the way through the milestone (i.e. straight forward world art asset lists), or they might only last a week or two with sufficient detail (i.e. Iterate on play test feedback - needs more feedback before the details of that task are known).

At least once a week Core Leads review the current tasks in JIRA and do the following:

* Ensure that weekly goals are being met
* Update any tasks that are falling behind in JIRA
* Add new tasks for any goals that have gained clearer definition for the next week
* Check weekly tasks and goals against the milestone and vertical slice goals to make sure week to week tasking is not veering from our higher level targets
* Update the Master Schedule Excel sheet with any changes
* Call out any new risks (global, phase, or milestone) that have surfaced

At mid-Milestone, the Core Leads do a Milestone Check-Up where the Core Leads will review all defined deliverables and make sure we're still on track for delivery of what waspromised.

At the end of the milestone, the Core Leads conduct a brief post mortem on the milestone and identify any changes or corrections that can be made to the process. So far, this structure has proved efficient and flexible, while still giving us enough detail to forecast long term scheduling issues and rough estimates for overall scoping concerns. However, the post mortem after each milestone should facilitate our ability to adjust and evolve our methodology based on the needs of the team and WBG if necessary.

## Risk Assessment

We’ve updated the [Risk Assessment](Production/Apollo%20PPM4%20Risk%20Assessment.docx) document fairly significantly. We've modified the format to hopefully help better identify the level of each of the risks as we see them and also help identify in what phase of production we feel the potential risk is at its greatest level.

# Design Update

Here are the Confluence Design changes since PPM3:

[**Vertical Slice Walkthrough**](https://confluence/display/batman/Vertical+Slice+Quest+Walkthrough) pages updated

* [Quest 3: Tumbler Rescue Chase](https://confluence/display/batman/Quest+3+-+Tumbler+Rescue+Chase) updated

**Player Movement:**

* [Walking & Running (Details)](https://confluence/pages/viewpage.action?pageId=18255507) page was updated
* [Climbing (Details)](https://confluence/display/batman/Climbing+%28Details%29) page was updated
* [Jumping (Details)](https://confluence/display/batman/Jumping+%28Details%29) page was updated
* [Stealth Movement (Details)](https://confluence/display/batman/Stealth+Movement+%28Details%29) page was added and updated.
* Player Movement Brainstorming updated with our [Parkour Notes](https://confluence/display/batman/Parkour+Notes).

**Story** section was updated

* Main page [Story](https://confluence/display/batman/Story) was updated
* New pages added for chapters:
  + [Game Story Chapter 0 (Prologue)](https://confluence/display/batman/Game+Story+Chapter+0+-+Prologue)
  + [Game Story Chapter 2](https://confluence/display/batman/Game+Story+Chapter+2+-+Dangerous+Waters)
  + [Game Story Chapter 3](https://confluence/display/batman/Game+Story+Chapter+3+-+Ventriloquist%27s+Trick)
  + [Game Story Chapter 4](https://confluence/display/batman/Game+Story+Chapter+4+-+Scarecrow%27s+Reach)
* [Gotham Dungeons](https://confluence/display/batman/Gotham+Dungeons) was updated with prioritized dungeon/hub venue list.

[**Campaign**](https://confluence/display/batman/Campaign) section was updated

* Dungeon – Chemical Plant was updated

[**Vantage Point System**](https://confluence/display/batman/Vantage+Point+System) **page** was added

Minor update to [**Vehicles**](https://confluence/display/batman/Vehicles) **page**

* [**The driving experience**](https://confluence/display/batman/The+driving+experience) **page** [updated](https://confluence/pages/diffpagesbyversion.action?pageId=18253824&originalVersion=20&revisedVersion=21)
* Minor update to [Vehicle AI](https://confluence/display/batman/Vehicle+AI) page
* [Vehicle Tuning](https://confluence/display/batman/Vehicle+Tuning) page added

**Fear and Awareness pages:**  Reorganized again by Jon Gramlich

* [**Behavior Implementation**](https://confluence/display/batman/Behavior+Implementation) **page** added, which is the umbrella for:
  + [Behavior List](https://confluence/display/batman/Behavior+List)
  + [Behavior Logic Map](https://confluence/display/batman/Behavior+Logic+Map)
  + [VO Callouts](https://confluence/display/batman/Behavior+VO+Callouts)
  + [Behavior Requirements](https://confluence/display/batman/Behavior+Requirements)
* Streamlining updates made to [Fear](https://confluence/pages/viewpage.action?pageId=14123117),  [Alertness States](https://confluence/pages/viewpage.action?pageId=14123699), [Stimuli and Senses](https://confluence/pages/viewpage.action?pageId=17039400), [Spatial Awareness](https://confluence/pages/viewpage.action?pageId=17039447)

[**Master List of AI**](https://confluence/display/batman/Master+List+of+AI) **page** was updated

[**Character Dump**](https://confluence/display/batman/Character+Dump) **page** was created

Minor updates to

* [**Stealth**](https://confluence/display/batman/Stealth) **page**
* [**Combat**](https://confluence/display/batman/Combat) **page**
  + [Combat Move List](https://confluence/display/batman/Combat+Move+List) page
* [**Control Schema**](https://confluence/display/batman/Control+Schema) **page**
* [Quests](https://confluence/display/batman/Quests) page
* [**Save Systems**](https://confluence/display/batman/Save+Systems) **page**
* [**Talent Tree**](https://confluence/display/batman/Talent+Tree) **page** 
  + [Talent Tree Example Images](https://confluence/display/batman/Talent+Tree+Example+Images) page added

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A [Design – Tools and Guidelines](https://confluence/display/batman/Design+-+Tools+and+Guidelines) page was added – this is not integral to design document.

[Environmental Standards](https://confluence/display/batman/Environmental+Standards) was updated – also not integral to design document.

## Core Design Requirements to Enter Production:

**Tools and Pipelines:**

* Fully functional tool for authoring combat that enables rapid iteration and provides a clear and intuitive visual interface for scripting the relationships between combat moves.
  + **Status Update 10.23.09:** The modified Snowblind combat tool is now outputting Apollo specific data, so next Milestone we will focus on reading in the data and the runtime system that uses the data to actually interpret input into combat. Our goal will be to author the button input and type of attack in the tool for a single attack, compile, and play back in game.
* Fully functional new scripting system ready for primetime.
  + **Status Update 10.23.09:** We have a first pass of our new ScriptEdit tool working. We have created a Scripting System Strike Team of engineering and design to stress test the system and create documentation and training for the rest of the team before the end of Vertical Slice.
* Identifying tasks design does over and over and making tools to assist
  + Possible tools
    - Quest tool, similar to *Neverwinter Nights* or *City of Heroes*.

**Production Details:**

* We are currently working to hire a Senior Combat Designer to help build and maintain the combat systems and workflows.
  + **Status Update 10.23.09:** We have interviewed some promising candidates and may be able to make an offer within a few weeks.
* We are creating estimates for how long it will take to design/script quests, dungeons, ambient crimes and so forth. As these systems come online, we will be evaluating the time and resources required to implement this content.
* We will need to have hired any necessary designers based on the estimates above early enough for them to get up to speed to contribute the man hours estimated to complete the game. This is estimated at 30-60 days before entering Production.

# Art Update

The [**Apollo Art Plan**](Art/Apollo%20Art%20Plan%20V1.0.docx) has been significantly updated with layouts of the documentation we will be creating as we develop pipelines and standards for creating content and some initial questions that we will need to answer as the in-sourcing/out-sourcing plans develop.

We will be updating the [**Art Style Guide**](Art/Apollo%20ArtStyle_v2.docx) on Friday in time for the final Milestone delivery to the DAG following our meetings with Shane Thompson on Thursday. It has been updated currently with some environmental work.

## Character Art: Batman Complete

## Goals

* Showcase the completed Batman base model (no cape).

## How to view this

* **Run “Character” Showcase Test World: “Character\_Room”**
* The completed ‘Batman’ base model has replaced the old model in this room. Note that the thugs are still present in this test world.

## Deliverables

* **Test World: “Character\_Room”**
* Video of Completed Batman base model rotating
  + [**Character\_Room.mov**](Videos/Character_Room.mov)

## Character Anim: Face Rig

Goals

* **Create face rigs for production**

**Deliverables**

* **Face Rig Videos**
  + [FaceRig\_Test.mov](Videos/FaceRig_Test.mov)
  + [FaceRig\_RunThru.mov](Videos/FaceRig_RunThru.mov)

## Combat: First Pass Combat Animations

**Goal:** Capture all the necessary animations for our first pass of combat, including at least one example of each type of attack or combo.

**Deliverables:**

* Video of Combat Animations:
  + [Combat Animation Video.wmv](Videos/ApolloM4AnimCombat_0001.wmv)

# Engineering Update

The [**Apollo Technical Design**](Engineering/Apollo%20Technical%20Design%20Doc.doc)has been updated to provide more detail on a few technical requirements for Apollo. More requirements will be added to the Technical Design as more research is conducted into those systems.

## Engineering Milestone Deliverables

## Audio Engineering

**Goal**: Fully integrate the 3rd party Wwise sound engine into our runtime systems and build process. After integration is complete no audio will be played from older systems until they are converted to make use of the new sound engine. We wanted to convert as many systems that are related to features already existing in the game.

**Result:** The new sound engine is now integrated into both our runtime systems and build process. Sound designers are now able to easily integrate and iterate on audio for the game with the systems that have been converted. To date we have converted the Grapple gun, animation frame strings, vehicles and designer placed game objects.

## AI Engineering

**Goal:** Fully integrate the 3rd party navmesh and pathing solution, PathEngine into our runtime and tools pipeline.

**Result:** Although we did not complete the full integration, we have the navmesh being auto generated from the geometry in the level through our tools pipeline. The AI is able to use the runtime navmesh to path appropriately. However, due to issues with the PathEngine project files, communication with PathEngien support, who is in France, and an unaccounted for AI Conference we were not able to get all of the expected functionality. Well will complete the integration for the next milestone. Here is a video showing our current progress:

**Result:**

* Path Engine Progress
  + [Path Engine Progress.mov](Videos/pathengineprogress1.mov)

## Runtime Engineering

**Goal:** Complete implementation on a new unified volume system that allows for a general solution to our many uses of volumes and containers. This feature would involve creating a system that would allow content creators to specify volumes of space within the editor, associate game objects/logic with the volume, and at runtime query information about volumes for a given primitive.

* **Result:** This new system is complete and in use by game systems such as the Stealth volumes and Quest object.

**Goal:** Now that the Havok Cloth evaluation and prototype from the previous milestone is complete we need to finalize the prototype and fully integrate Havok Cloth (cape support only) into our runtime systems and tools pipeline.

* **Result:** All prototype code related to the cape evaluation using Havok Cloth has been refactored or rewritten to a finished state. This will allow us to make use of all of the Havok Cloth features related to capes and more easily iterate on the look of Batman’s cape.

**Goal:** In order to achieve larger and seamless game spaces, as well as fully support anticipated Downloadable Content requirements, all of our assets will need to be streamed. Materials and String Databases were identified as the next assets to be converted to be streamed in. The String Database runtime also needs to be able to load in and search multiple String Databases to support DLC.

* **Result:** Both Materials and String Databases can now be streamed in rather than loaded all at once. The String Database runtime can now also load in multiple packed String Databases to better support DLC and allow for individual String Databases to be specified per level.

## Graphics Engineering

**Goal:** Apollo is shooting for a gritty looking environment that takes place at night, largely in the city. Street lights are a very noticeable component to any night time city environment. Our goal was to create an Atmospheric lighting system that would support the look of a foggy, gritty, night time city without incurring too much overhead

**Result:**

* Atmospheric Light Effect
  + [Screenshot #1.bmp](Screenshots/ScreenSpaceAtmosphericLightEffect_1.bmp)
  + [Screenshot #2.bmp](Screenshots/ScreenSpaceAtmosphericLightEffect_2.bmp)
  + [Screenshot #3.bmp](Screenshots/ScreenSpaceAtmosphericLightEffect_3.bmp)
  + [Screenshot #4.bmp](Screenshots/ScreenSpaceAtmosphericLightEffect_4.bmp)
  + [Screenshot #5.bmp](Screenshots/ScreenSpaceAtmosphericLightEffect_5.bmp)

## Tools Engineering

**Goal:** FxEdit loads up files that contain a collection of Fx that have been organized by content creators. This has caused issues in the past with some FX spanning the categories of multiple collections and when multiple Fx artists are trying to work with different Fx within the same collection. Our goal was to separate out individual Fx into separate source files.

**Result:** FxEdit now loads up individual Fx files and allows source control operations on those individual files, allowing multiple Fx artists to work on Fx for the game.

**Goal:** Provide additional information on the build dashboard page for better understanding of what builds are currently running. Also, switch the builds run by the dashboard from a poll system to system that respond to Perforce triggers

**Result:**

* Complete and viewable:
  + <http://apollobuild/default.aspx>

# Audio Update

The [**Apollo Audio Design**](Audio/Audio_Docs/Apollo%20Audio%20Design.docx) document has had a **Stealth** section added.

The [**Apollo Music Design**](Audio/Audio_Docs/Apollo%20Music%20Design.docx) document has had some edits made due to changes in the cinematics section.

## Audio Milestone Deliverables

## Melee Combat

For the last couple of weeks Audio have been recording original assets for the melee portion of Apollo.  We've been working with original material will allow Apollo to provide a unique aural experience to the end user.  So many games, including Arkham, rely on the traditional “slappy” punch that lives in libraries that developers regularly turn to for their sounds.  By avoiding those overused effects, we are able to provide audio that is more real and gritty than our competitors.  To best demonstrate the set of assets Audio has created, we've added my sounds to four different Arkham videos revolving around melee combat (two of which are duplicated, one with and then without music).  In these videos Audio has added other layers to give a richer experience to display our recent work including body falls, whooshes, cape sounds, music, AI grunts, reverb, and sound stingers on specific moments of gameplay.  All of these additional sounds are considered temp at this point but add to the experience and are necessary to fully appreciate the impact sound set.  The quick, staccato impact sounds will give us freedom to enrich Apollo’s fast combat gameplay but also gives our audio team room to add additional Foley and sound effects to further augment the combat experience.

**Deliverables**

* [Apollo Melee Prototype SFX\_01.mov](Audio/Videos/Melee_Combat/ApolloMeleePrototypeSFX_01.mov)
* [Apollo Melee Prototype SFX\_01\_NoMusic.mov](Audio/Videos/Melee_Combat/ApolloMeleePrototypeSFX_01_NoMusic.mov)
* [Apollo Melee Prototype SFX\_02.mov](Audio/Videos/Melee_Combat/ApolloMeleePrototypeSFX_02.mov)
* [Apollo Melee Prototype SFX\_03.mov](Audio/Videos/Melee_Combat/ApolloMeleePrototypeSFX_03.mov)
* [Apollo Melee Prototype SFX\_04.mov](Audio/Videos/Melee_Combat/ApolloMeleePrototypeSFX_04.mov)
* [Apollo Melee Prototype SFX\_04\_NoMusic.mov](Audio/Videos/Melee_Combat/ApolloMeleePrototypeSFX_04_NoMusic.mov)

## Vertical Slice (World)

For the vertical slice world we are proposing to have a global wind audio in the world be relative to highest building the player has access to. Essentially there will be a value scaled for wind intensity as the player goes higher or lower in the world. There is also a proposal for creating a dynamic wind volume for different shapes and sizes that will live in the prefab of the buildings. This is mainly for rooftops.

The video included for this example demonstrates the audio for wind scaling and a example of the proposed dynamic wind volume system in the rooftop areas.

**Deliverable**

* [VerticalSlice\_Wind.mov](Audio/Videos/VerticalSlice_Wind/VerticalSlice_Wind.mov)

## Apollo Music - Combat Music Demonstration in Wwise

This video shows the following Apollo music features functioning in Wwise:

* Musically-timed transitions into Combat Themes from lower intensity levels.
* Randomized stingers for heavy attacks that cue on beat boundaries.
* Support for special moves such as "Bone Break" that filter the combat arrangement while playing the stinger--triggered by a single event.
* Music support for enemy stun states and finishing moves.

**Deliverable**

* [M4\_Combat\_Music.mov](Audio/Videos/Music/M4_Combat_Music.mov)

## Stealth

This milestone, Audio has taken what was mocked-up in the last time and translated it to in-game.   As Batman enters Stealth, an event is fired calling a transition sound, a volume reduction and  low-pass filter on environmental sounds, and a change in the music track. Where these parameters will ultimately be set is still up in the air and will need tweaking over time.

As the player moves about the area, they can hear wind, distant city ambience, steam vents, and music.   The music is relatively quiet compared to the environmental elements.   On entering stealth, the music shifts to play a “stealth theme” and the background ambience ducks in volume and becomes more filtered. The voices of the AI are unaffected by this change, which makes them more intelligible to the player when in stealth.   In the future, the plan is to try adding some subtle DSP (delay, reverb, etc.)  to the Environmental bus in Wwise to further emphasize the difference of being in-stealth vs. out-of-stealth to the player. (For explanation of the music portion of the video, see Nathan Grigg’s notes)

**Deliverable**

* [Audio\_M4\_Stealth\_Mode.mov](Audio/Videos/Stealth/Audio_M4_Stealth_Mode.mov)

This next video is meant to explore what happens if Batman can run in and out of Stealth volumes very quickly.   We were worried that if we turned down the environmental sounds and changed the music, that this would sound “choppy” if Stealth mode was triggered on and off rapidly.   As you can see in the video, this should not be an issue with Wwise.  Currently the transition time is set to 3 seconds, so the full alteration of ambience ducking and music  will slowly crossfade over that amount of time.  In effect, the player must remain in stealth for a significant amount of time to hear these changes.

The transition sound that plays when the player goes in/out of Stealth is something Audio will have to work on going forward.   In this video, it plays way too often and quickly begins to get annoying. Audio will experiment with different assets as well as re-triggering times to find a way to make the quick transitions sound smoother.

**Deliverable**

* [Audio\_M4\_Stealth\_Trans\_Speed.mov](Audio/Videos/Stealth/Audio_M4_Stealth_Trans_Speed.mov)

In this next short video, Audio took Matt Rice’s test world and added a trigger which now sets off a stimulus and a sound effect. The AI react accordingly. Currently the dialogue is triggered off of the animation, but in the future it will be more behavior-based and different voices will be selected based on the character type. Audio discovered that we'll need to get record more variation on what the AI is saying as it repeats often as it is now.

**Deliverable**

* [Audio\_M4\_AI\_Stimulus\_React.mov](Audio/Videos/AI_Voice/Audio_M4_AI_Stimulus_React.mov)

## Gadgets

These are the sound events for the gadgets **Smokebomb** and **Batarang**, which came online this milestone.

**Deliverable**

* [Milestone4\_batarang\_smokebomb\_inGame.mov](Audio/Videos/Gadgets/milestone4_grapple_inGame.mov)

This next video shows the Grapple Gun improvements for this milestone.  There is now a parameter called "distance\_grappled" which affects how the grapple sounds based on how far player is grappling.

**Deliverable**

* [Milestone4\_grapple\_inGame.mov](Audio/Videos/Gadgets/milestone4_grapple_inGame.mov)

This next video is the same video as " milestone4\_grapple\_inGame" but has some cape sounds added to it to reflect how the grapple event will sound when the cape is added to the player model.

**Deliverable**

* [Milestone4\_grapple\_wtih\_capeMockup.mov](Audio/Videos/Gadgets/milestone4_grapple_wtih_capeMockup.mov)

## Vehicles

This next video shows the tumbler as it sounds currently in-game.  We have an engine which shifts gears being driven by the RPM parameter passed from the game engine.  Also, the game currently has Brake, Boost, and Skid sounds.

**Deliverable**

* [Milestone4\_tumbler\_inGame](Audio/Videos/Vehicles/milestone4_tumbler_inGame.mov)

This next video is the same video as " milestone4\_tumbler\_inGame " with added sweetener of what it will sound like with a turbine & lion sounds which will be driven from a SPEED parameter.

**Deliverable**

* [Milestone4\_tumbler\_with\_Mockup](Audio/Videos/Vehicles/milestone4_tumbler_with_Mockup.mov)

## Audio Engineering

* WWise is fully integrated into the game, and sound designers are using it, as well as into the build process.
* New audio engine is in, and is allowing for fast integration into game systems.
* Several game systems have been upgraded to the new audio engine, including Grapple, Vehicles, animation, and world sound objects.
* Began working on Cape sound design, city/building wind design.
* Beginning work on upgrading the rest of the game systems, including effects and weapons.

# Milestone Deliverables

## Player Movement: Walk/Run/Turn 2nd Pass

**Goal:**  Convert the complex animation system driving player movement to a data driven, more production ready form that allows for rapid iteration by content creators. Then use this new interface to improve the responsiveness and accuracy of basic planar player movement.

While we did successfully refactor the system into a format that will allow content creators to rapidly iterate going forward, once this major change was complete we did not get to spend enough time actually tuning the movement to make many meaningful improvements on the feel. It feels very similar to the way it was last milestone (too slow to respond to basic turning while walking or running forward), but there are a couple improvements that are significant:

1. The hard turns (90-180 degrees) are much more responsive and accurate now. In previous builds, pressing a 130 degree angle on the stick might get you a 180 hard turn followed by a slow correction to the appropriate angle. Now the player plants and immediate takes off in exactly the direction of the stick press. This makes accurate, sharp cornering much possible (where it wasn’t before).
2. Starting movement from and idle state is more responsive now, as we’ve added step off animations for each direction. In previous builds, pressing a 130 degree angle on the stick from idle would cause the long “idle turn in place” animation, then the player would start moving. Now, the player immediately start a “step off” animation in the direction you pressed. This really improves the feel when starting movement from idles.

**How to view:**

* **Run Player Movement Test World: “Movement\_Planar”**
* There are red lines on the ground that can be used to experiment with the hard turn and step off accuracy.
* Note: Current camera experiments may make it difficult to easily observe the accuracy of the step off and hard turn improvements, as the camera will quickly adjust around behind the player causing the player direction to quickly change (since it’s camera relative).

**Deliverables:**

* **Player Movement Test World: “Movement\_Planar”**
* Video of planar movement:
  + Planar Movement Video

## Player Movement: Shadow Dive 1st Pass

**Goal:**  Add first pass functionality for Gear of War style sticky cover to enable Batman to move from wall-hug to wall-hug in Stealth game play.

**How to view:**

* **Run the StealthTest World: “Stealth\_Action”**
* Pressing the Left Stick towards a wall and pressing Right Bumber will cause Batman to run/dive into wallhug. This is using the complex animation system to parameterize to any approach angle.
* While in wallhug on one of the blue cubes in the room, moving up to the edge, holding the Left Stick towards the gap to the next blue cube over and pressing Right Bumper will cause Batman to dive across the gap and get into cover on the other side.
* Notes:
  + This works for crouch height as well as standing height walls.
  + This can also transition across a gap to any angle of wall, not just parallel surfaces.
  + These dives are combinations of entry and exit animations, but there is currently no blending between them, so most transitions will have a clear pop where the animation changes.

**Deliverables:**

* **Stealth Test World: “Stealth\_Action”**
* Video of Shadow Dive movement:
  + [Shadow Dive Video](Videos/ShadowDive.mov)

## Player Movement: Grapple 2nd Pass

**Goal:**  Add FX and audio to the grapple hook and tune speeds and distances based on internal feedback.

**How to view:**

* **Run the Vertical Slice Hub Test World: “H0\_Hub”**
* There are grapple points all around the hub to test this. The speed of the grapple hook travel has been slowed to try and give this type of movement a little more weight while maintaining the fun freedom to disengage at any point and transition to glide or a new grapple target.

**Deliverables:**

* **Vertical Slice Hub Test World: “H0\_Hub”**
* Video of Grapple movement:
  + [milestone4\_grapple\_inGame.mov](Audio/Videos/Gadgets/milestone4_grapple_inGame.mov)

## Player: Stealth 1st Pass

**Goals:**

* Demonstrate Stealth gameplay in a system-oriented world
* When in shadowy areas, Batman’s appearance will change to highlight that he is in stealth.
* Batman is able to perform instant takedowns with special stealth attacks.

**How to view this:**

* **Run Stealth System Test World: Stealth\_Action**
* *To see iteration on ‘Stealth’ mode:*
  + Navigate into a clearly defined shadow. There are two effects that will trigger: Player and Environment.
    - *Player FX:* Batman’s texture and emissive will change depending on if he is actively seen by an AI. If he is not seen, then he will change to a blue tint to reflect that he is completely hidden. If he is seen, then his emissive will still shine to keep him visible to the player, but he will not turn blue.
    - *Environment FX:* Regardless of whether Batman is seen or not, the ambient HDR in the world will increase to indicate that the player is in a shadow area.
* *To see a Stealth Attack:*
  + Approach an AI from behind without being seen by him.
  + Once behind the AI, press the <B> button.

**Deliverables:**

* **Test World: “Stealth\_Action”**
* Video of Stealth System in action
  + [AI\_Discover.mov](Videos/AI_Discover.mov) – Showcases Player and Environment FX when in stealth volume; note that the player FX go away when Batman is spotted
  + [StealthAttack.mov](Videos/StealthAttack.mov) – Showcases Batman performing a stealth attack on an unsuspecting AI

## Gadgets: Batarang / Smokebomb 1st Pass

**Goals**

* Demonstrate first pass functionality of both the Batarang and Smokebomb
* Demonstrate first pass functionality of Gadget Selection

## How to view this

* **Run Stealth System Test World: Stealth\_Action**
* ***To use Gadget Selection:***
  + In the bottom-left corner of the screen, around the minimap, there are gadget selection UI elements. Batarangs and classified on the left, Smokebombs on the right.
  + To select batarangs, simply press ‘Left’ on the D-Pad. This will highlight that particular type of gadget and it will be ready for use.
    - Additionally, you can continue to cycle through different kinds of Batarangs by continuously pressing ‘Left’ on the D-Pad.
    - Instead of cycling through the types, you can also press-and-hold ‘Left’ on the D-Pad to bring up a visual context menu instead (seen in the lower-right corner of the screen).
    - NOTE: As we currently only have one Batarang and one Smokebomb type so far, these other selections are only placeholder to showcase the system.
  + These processes can be repeated for Smokebombs by pressing or holding ‘Right’ on the D-Pad.
* ***To use the Batarang:***
  + Press ‘Left’ on the D-Pad
  + To quick-throw straight ahead, press ‘Left Trigger’
  + To use precision-aim, press-and-hold ‘Left Trigger’
    - A debug reticule will display and you will have limited range for aiming. Release ‘Left Trigger’ when you want to throw.
  + Note that the Batarang *will* do damage to AI and knock them out if you hit them enough.
* ***To use the Smokebomb:***
  + Press ‘Right’ on the D-Pad
  + To quick-throw it straight down at your feet, press ‘Left Trigger’
  + To use precision-aim, press-and-hold ‘Left Trigger’
    - A debug reticule will display and you will have limited range for aiming. Release ‘Left Trigger’ when you want to throw.
  + Note that the Smokebomb *does* occlude Line of Sight for AI, so you are able to use it to get away or throw up a smoke screen to block view.
* ***To see a Stealth Attack:***
  + Approach an AI from behind without being seen by him.
  + Once behind the AI, press the <B> button.

Deliverables

* **Test World: “Stealth\_Action”** *(note that gadgets can be used in any level)*
* Video of Gadgets in action
  + [Batarang\_01.mov](Videos/Batarang_01.mov) – Showcases Batman utilizing precision-aim with the Batarang
  + [Batarang\_02.mov](Videos/Batarang_02.mov) – Showcases Batman utilizing quick-throw with the Batarang
  + [Smokebomb\_01.mov](Videos/Smokebomb_01.mov) – Showcases Batman utilizing quick-throw with the Smokebomb and escaping from an AI
  + [Smokebomb\_02.mov](Videos/Smokebomb_02.mov) – Showcases Batman utilizing precision-aim with the Smokebomb

## Camera: Tunable Player State Driven Variables

**Goal:** Engineering exposes key variables to design (i.e. default position, interpolation speed to correct to default position, etc) that can be tuned per player state (i.e. grapple, glide, run, walk, etc) with zero iteration time, then Design tunes each state and experiments with different feels for camera position and responsiveness.

**How to view:**

* **Run the Vertical Slice Hub Test World: “H0\_Hub”**
* This is one tuning that is being experimented with. The idea of this tuning is to try and hit default positions and speeds where the player will never have to touch the camera stick while walking, running, or gliding. Also, the walk camera default position is in much closer to the player model than in previous builds.
* There are many more edge cases and variables already identified that we will be adding to improve our ability to predict what the player intention is with the camera. We are also using Assassin’s Creed’s camera as a reference point for identifying major missing components to add next milestone.

**Deliverables:**

* **Vertical Slice Hub Test World: “H0\_Hub”**

## AI:   AI Awareness/Reaction 1st Pass

## Goals:

* Demonstrate AI reacting to a player stimulus in various states of alertness.
* Depending on distance to and time aware of the stimulus, the AI will perform certain perception behaviors (based on alertness) to try and identify the threat.

## How to view this

* **Run Stealth System Test World: “Stealth\_Action”**
* There are two patrolling AI to interact with.
* There are checkered textures (triggers) on the ground; these will respawn the AI if they are both killed.

**Test Case 1: Notice 🡪 Dismiss**

1. Hiding behind the green cube, step out into the line of sight (LoS) of an AI when it is far away.
2. Immediately duck back out of line of sight.

Result:

* The AI will perform ‘Notice’
  + *Animation:* Being startled from his previous behavior and peering toward your location
  + *Audio:* Triggering an appropriate VO (e.g. “What’s going on around here!?”)
* The AI will perform ‘Dismiss’
  + *Animation:* Wave his hand and resume his behavior
  + *Audio:* Trigger an appropriate VO (e.g. “Alright, get a hold of yourself!”)
* The AI will resume his previous activity, and his alertness value will begin to diminish

**Test Case 2: Notice 🡪 Dismiss 🡪 Notice 🡪 Investigate**

1. Hiding behind the green cube, step out into the LoS of the AI when it is far away
2. Once noticed, duck back out of line of sight
3. Wait until the AI dismisses you (i.e. has finished his animation and VO)
4. Step back out into the line of sight of the AI
5. Once seen, duck back out of line of sight

Results:

* When the AI first sees you, he will perform ‘Notice’
* Once out of sight, he will eventually perform ‘Dismiss’
* At this point, he has resumed his previous behavior, but at an elevated alertness rating (but still ‘Low’ alertness)
* When stepping out and being seen again, the AI’s alertness level immediately jumps to ‘Medium’
* This causes the AI to initiate ‘Investigate’
  + Runs to the last seen location and looks around
  + Assuming he cannot find the disturbance, he will then dismiss it
* Since the AI is not at HIGH alertness, he will not initiate a search behavior, and will instead resume his previous activity. His alertness level will slowly begin to drop. Notice that at first, he resumes patrolling at a jog: this is because he is still AlertMedium. Once he calms down, he returns to a walk.

**Test Case 3: Notice 🡪 Investigate 🡪 Search**

1. Hiding behind the green cube, step out into the LoS of the AI
2. Once noticed, continue to stay in place until the AI fully recognizes a threat (i.e. begins to run toward you
3. Immediately duck back out of LoS

Result:

* The AI will perform ‘Notice’
* Depending on how close or far you are from the AI, a certain amount of time will elapse and the AI will identify you as a threat
* Once line of sight is lost, the AI will initiate ‘Search’ (Begin walking to search nodes in the area that Batman was last seen)
* At each search node, the AI will initiate ‘StatusCheck’ (Peering around in the area of the node, looking for Batman)
* The AI’s alertness level will atrophy while searching is going on. Once he drops from a high alertness state to medium, he will no longer search and instead return to his last behavior.

*General Note:*

* The AI’s perception is based both on distance as well as shadow. If you are out of shadow and get in the LoS of an AI, the time it takes for him to recognize you is based on distance. I.e. if you are very close, he can recognize you immediately. If you are a medium distance, he will notice and take a short while to identify you. If you are further (but still in range), he will notice and take longer to identify you.

## Deliverables

* **Test World: “Stealth\_Action”**
* Video of AI Awareness states in action:
  + [AI\_Notice.mov](Videos/AI_Notice.mov) –Video showcasing Test Case 1
  + [AI\_Investigate.mov](Videos/AI_Investigate.mov) –Video showcasing Test Case 2
  + [AI\_Search.mov](Videos/AI_Search.mov) – Video Showcasing Test Case 3

## Vehicles: Tumbler 2nd Pass

**Goal:** Add first pass weapons to the Tumbler (including rough FX). Add more rough FX to Tumbler movement (Camera Shake/FOV on boost, wheel dust). Add rough audio for Tumbler movement (boost sound/FX not always lined up correctly). Tune Tumbler handling slightly (need to spend much more physics engineering time before major tuning changes are possible).

**How to view:**

* **Run the Vehicle Track Test Worlds: “h0driving1” or “Falcone\_Track”**
* Pressing X Button fires Machine Guns.
* Pressing Y Button fires Rockets.
* All red items in the world should be destroyable with either weapon.

**Deliverables:**

* **Vehicle Track Test Worlds: “h0driving1” or “Falcone\_Track”**

## Vehicles: Layout Iterations

**Goal:** Iterate on the Vertical Slice Vehicle Sequence layout and create a first pass of a second Tumbler track in a completely different environment (Train Yard).

**How to view:**

* **Run the Vehicle Track Test Worlds: “h0driving1” or “Falcone\_Track”**
* The iteration on h0driving is mostly at the end where the player can shoot out some jersey barriers and drive through a building into a parking garage. The end of the sequence now requires the player to drive to the top of the parking garage and jump off a ramp into a building with the helicopter on top. This now triggers a simple keyframed camera that represents the cinematic cut to Batman ejecting from the Tumbler as it crashes into the building and gliding/grappling to the helicopter.
* Falcone\_Track represents some experiments with different layout ideas from the h0driving1 track. The train yard has some terrain, branching paths and small arenas that could be used for light combat.

**Deliverables:**

* **Vehicle Track Test Worlds: “h0driving1” or “Falcone\_Track”**

## Vertical Slice Hub Layout: Layout Iterations

**Goal:** Incorporate Art team feedback into layout to finalize footprint. Script all quests using new scripting system and new quest system. Navigation pass: Thorough pass of grapple points around the hub. Targeted pass of freerunning obstacles through the likely quest routes.

**How to view:**

* **Run the Vertical Slice Hub Test World: “H0\_Hub”**
* The perimeter is now fully roughed in. Boundaries are representative of how we will handle them in the game (i.e. water, freeway, etc).
* Quests are now activated through the new Vantage Point system. The player approaches the quest start point and presses the prompted button which starts a roughed in cinematic sequence showing the quest space before returning control to the player.
  + Note: When a quest is activated, the other quests are disabled until that quest is completed.
* Completing the 2 story quests (collecting evidence from the rooftop and the mall atrium) will now unlock the vehicle sequence quest which can be started from the safehouse. When activating the quest in the safehouse, the game will now actually launch the vehicle sequence test world.
* There is a tutorial quest in the hub for player movement which will ask you to follow a series of waypoints as it explains the basic player movement concepts.
* There is also a simple “challenge” mission type of quest that starts at the top of a building near the waterfront and just generates a large number of waypoints to try and touch in any order.
* Notes:
  + Detailed quest information should be visible in the pause menu in the “Quests” section.
  + Before starting the rooftop quest with the gunmen, make sure to turn on God Mode in the Cheats menu inside the Pause Menu. If you die while on this quest, you will have to return to the main menu and launch again.
  + If you have trouble finding the entrance to the Mall Atrium Quest, grapple on top of the glass wall and find the holes near the corners on the glass ceiling that allow you to drop down.

**Deliverables:**

* **Vertical Slice Hub Test World: “H0\_Hub”**

## Quest System - 1st Pass

## Goals

* Demonstrate first pass functionality of the Quest System. Features include: Vantage Point System, Quest Selection, Activation, UI, Cancellation, Completion and linking/unlocking Quests.

## How to view this

* **Run Vertical Slice Hub Test World: “H0\_Hub”**
* *To use find a Quest:*
  + There are two immediate ways to find a quest.
    - The first is by navigating via your minimap: wherever there is a blue bat icon, a quest start point is available.
    - Additionally, you can guide yourself to a specific quest by pressing ‘Start’ > ‘Quests’ > and highlighting the option you’d like by pressing ‘A’ on it.
      * This will highlight the blue bat icon for that specific quest into a turquoise icon
* *Activating a Quest:*
  + Quest activation/start-point areas are called ‘Vantage Points’. They are highlighted by a glowing ‘Batman’ logo on the surface where the quest begins.
    - Note: If you have specifically highlighted a quest (noted in previous step), then the Vantage Point logo will rotate on the ground as another indicator to the player.
  + Once in the Vantage Point, press ‘Right Bumper’ to start the quest.
  + The objectives of the quest will show up on the screen, as well as a short cinematic camera animation to set up the scene (this feature currently only set up for ‘Rooftop Crime Scene’).
  + Note that once a quest is activated, all other vantage points will disappear from the world.
    - They will repopulate if the currently active Quest is either completed or cancelled.
* *Completing the quest:*
  + Following the objectives listed. E.g., for the ‘Rooftop Crime Scene’ quest, gather 6 pieces of evidence (they are indicated by placeholder exclamation points in the world).
  + Note that when you make progress on completing a quest (e.g. finding another piece of evidence), a UI prompt will display to update you.
    - You can also review your progress by returning to the ‘Quests’ page in the main menu (‘Start’ > ‘Quests’)
* *Cancelling the quest:*
  + After beginning a quest, you can enter the ‘Quest’ menu and press the ‘Y’ button to cancel it.
* *Unlocking new quests:*
  + The system supports the ability to link quests together in order to unlock new ones.
    - Complete the ‘Rooftop Crime Scene’ and ‘Mall Atrium Interrogation’ quests to unlock a third ‘Vehicle’ quest
      * Note: This quest showcases our ability to load into separate levels/dungeons if necessary.

*General Note:*

* Currently if you die and reload into the game, the quest functionality will break. You will need to restart the level and initiate the quest from the beginning to see the entire functionality.

Deliverables

* **Test World: “H0\_Hub”**
* Video of Quest system
  + [Quest.mov](Videos/Quest.mov) – Batman arriving at a highlighted Vantage point and activating the quest

# Setting Up The Build

* Extract [Milestone\_4\_Xbox.rar](Milestone4Build/Milestone_4_Xbox.rar) to your PC
* Copy to your Xbox360 Game development Hard Drive
* This build currently supports XDK 8276 (appears to unofficially work on 9328).

# Launching a World on XBOX360

* From the Launcher select “Apollo\_R.xex”
* On the Main Menu select “Start”
* Scroll down and select “Custom Level”
* Select the “Worlds” folder, then the “Milestone 4” folder
* Select the desired world to launch
* To launch a different world, select START and select MAIN MENU

Known issues that may affect Milestone play through:

* [**APO-2162**](https://jira:8443/browse/APO-2162) **–** Shadow dive during a combat animation causes wall hug at current location
* [**APO-2147**](https://jira:8443/browse/APO-2147) **–** Ramps are considered walls for shadow dive, causing batman to wall hug the ground
* [**APO-2033**](https://jira:8443/browse/APO-2033) **–** Drop from hanging is unreliable
* [**APO-2136**](https://jira:8443/browse/APO-2136) **-** The Brake Light Trailing effect is being shown when not boosting.
* [**APO-2113**](https://jira:8443/browse/APO-2113) **-** Boost effect plays after letting go of boost button when boost has depleted
* [**APO-2168**](https://jira:8443/browse/APO-2168) **-** Completing a quest puts an ambient crime marker at the completed quests activation point
* [**APO-2170**](https://jira:8443/browse/APO-2170) **-** Cancelling the active quest and restarting it does not reset quest items
* [**APO-2173**](https://jira:8443/browse/APO-2173) **-** Restarting a level after dying during a quest disables the quest. It is impossible to restart or continue the quest (NOTE – the game must be fully restarted to recover from this.  God mode should be used to avoid this.  The cheats menu is accessible from the pause menu).
* [**APO-2175**](https://jira:8443/browse/APO-2175) **–** Tumbler frame is left in its last location for vehicle missions when loading them from the main menu

# APPENDIX A: Documentation Links

* [**Vertical Slice Plan**](Design/Apollo%20Vertical%20Slice%20Plan%20V1.1.docx)
* [**Vertical Slice Schedule**](Production/Apollo%20Vertical%20Slice%20Schedule.xlsx)
* **Production**
  + [**Product Data Sheet**](Production/Apollo%20Product%20Data%20Sheet.docx)
  + [**Milestone Deliverables Schedule**](Production/Apollo%20Milestone%20Schedule%20PPM4.docx)
  + [**Vertical Slice Schedule**](Production/Apollo%20Vertical%20Slice%20Schedule.xlsx)
  + [**Resource Allocation & Assessment**](Production/Resource%20Allocation%20&%20Assessment_PPM4.xlsx)
  + [**Apollo PPM4 Risk Assessment**](Production/Apollo%20PPM4%20Risk%20Assessment.docx)
* **Design**
  + [**DLC/Social Plan draft**](Design/Apollo%20Vertical%20Slice%20Plan%20V1.1.docx)
  + [**Play Test Plan draft**](Design/PlayTestPlan.doc)
* **Art**
  + [**Art Style Guide**](Art/Apollo%20ArtStyle_v2.docx)
  + [**Art Plan**](Art/Apollo%20Art%20Plan%20V1.0.docx)
* **Engineering**
  + [**Technical Design Plan**](Engineering/Apollo%20Technical%20Design%20Doc.doc)
* **Audio** 
  + [**Audio Design Plan**](Audio/Audio_Docs/Apollo%20Audio%20Design.docx)
  + [**Music Design Plan**](Audio/Audio_Docs/Apollo%20Music%20Design.docx)