A Comprehensive Overview of Smash Ultimate Amiibo Bins

Last Updated: 12-13-2024

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Special thanks to fudgepop01, jozz, CraigUK37, Ske, ammoknight, Scrooge, Abbie, Hictor, Ultra Fishbunjin, Hidari, thatmagicstore, Blank, untitled1991, RAPJM, Dolphay, PXYFAN, God of Death, Frost, Azend, TrueTitan14, Ethan, Leaf, and everyone else who contributed to amiibo research.

Smash Amiibo Editor

https://github.com/jozz024/smash-amiibo-editor/releases/

Developed By: jozz & MiDe

Brief History

It's worth noting that I'm about to go over the history of the App Data section of amiibo for Super Smash Brothers (It's where specific game data is saved). When I talk about bins, I'm talking about this section specifically, not the entire bin file. This also only details the editing history in relation to the competitive amiibo community.

Despite figure players existing in Smash 4, very little progress was made at decoding bins. The only editing that was done was through Powersaves, which allowed users to edit the amiibo's level, equipment, and stats. Early on in Smash Ultimate, fudgepop01 developed a program called Amiibox. This program allowed the editing of level, stats, spirit effects, but also more. It allowed the user to edit the bytes that control a figure player's behavior. This was the beginning of figure player research. From there, myself and many others spent countless hours attempting to isolate regions that control specific actions. Great progress was made, but there was still a lot left to be desired. We had the general area for most actions but were slightly off.

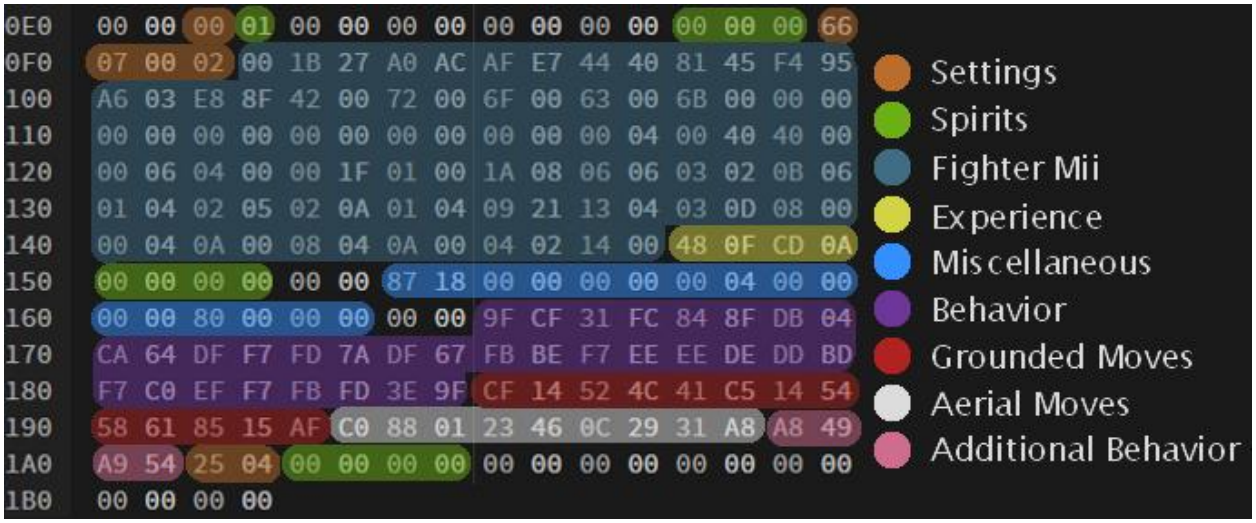
While attempting to implement amiibo bin loading in the Ryujinx emulator, I noticed an interesting log that occurred while saving amiibo. This was the first major breakthrough, as that log was the interpreted values of the behavior sections. From there, I was able to isolate each behavior region through simple guessing and checking. It was at this time when ammoknight found what we believe to be a complete list of section names from fudgepop01's research.

With a new understanding of how sections are formed, I dug deeper into an idea I had regarding "default" values. The concept is that when you feed a level 1 amiibo a spirit, its values get set to specific values based on what type of spirit it was. All of the move sections get set to the same value, *regardless* of what type the spirit was. I figured these must be "default" values and was able to isolate the remaining sections based on patterns in the values.

Overview

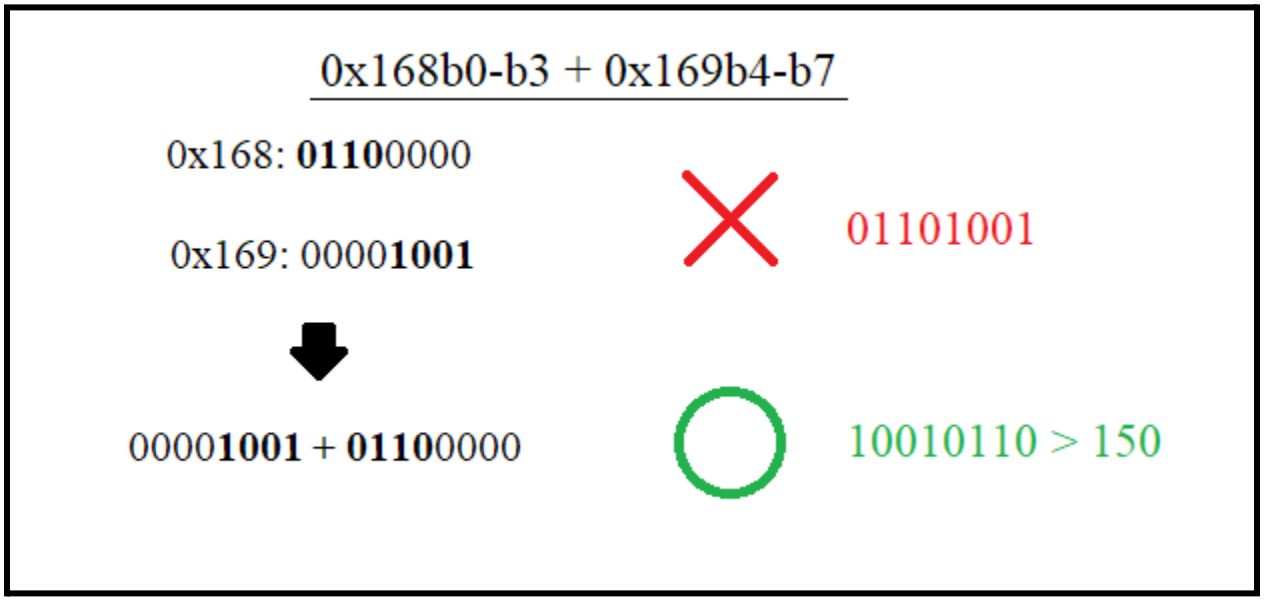
*Note: The notation I'm using is in the form 0x168b1-b3. 0x168b1-b3 would specify the bits 0**111**0000 in byte 0x168. All ranges are **inclusive** ranges. All byte locations are from when decrypting with amiitool. Other methods of decryption such as pyamiibo may result in different byte locations.*

The general layout of amiibo bins can be found here with more info here. The App Data section, which is where game data is stored, starts at 0xDC is 216 bytes long. The first 4 of these bytes are used for encryption purposes. The rest are broken up into the following areas:



Each area has sections within it that are more in-depth explained below. These areas are not defined in-game but rather something I use to better organize the bytes. All of the unmarked values are most likely padding or extra space left in case they ever wanted to add anything to amiibo. It's worth noting that everything listed in this document is what we currently believe to be true. There might be slight errors in section descriptions. The behavior, grounded moves, aerial moves, and additional behavior areas are commonly referred to as the "personality" area in the bin. This is because they are responsible for determining the personality of the amiibo.

Note: If a section goes across multiple bytes, its value is calculated by reversing the order of the bytes, then calculating the value in little endian from there.



"Safe" Serial Number Shuffling

For whatever reason, certain serial numbers will brick powertags. It is currently believed that this is caused when the fourth byte (UID 3) of the serial number is 136/0x88. So when using the powersaves serial number shuffler, there is a 1/256 chance that the powertag will get bricked. SAE and bint use a shuffling method that takes out that number, so they are safe to shuffle with. See https://www.nxp.com/docs/en/application-note/AN10927.pdf

Settings

Note: All shown values in the settings section are the unsigned binary converted into decimal, unless otherwise stated.

Learning: 0xE2b7

- 0 - Learning Off
- 1 - Learning On

Journey: 0xE2b6

- 0 - Amiibo is not on a journey
- 1 - Amiibo is on a journey

Alternate Skin: 0x1A3b4-b7

For non-Mii Fighters:

- 0 - Alternate Skin 1
- 1 - Alternate Skin 2
- 2 - Alternate Skin 3
- 3 - Alternate Skin 4
- 4 - Alternate Skin 5
- 5 - Alternate Skin 6
- 6 - Alternate Skin 7
- 7 - Alternate Skin 8

For Mii Fighters:

- 0 - Color 1
- 1 - Color 2
- 2 - Color 3
- 3 - Color 4
- 4 - Color 5
- 5 - Color 6
- 6 - Color7
- 7 - Color 8
- 8 - Color 9
- 9 - Color 10
- 10 - Color 11
- 11 - Color 12

Mii Voice/Starter Pokemon: 0x1A2

For Pokemon Trainer:

- 0 - Squirtle
- 1 - Ivysaur
- 2 - Charizard

For Mii Fighters:

- 0 - Type 7, Pitch Low
- 1 - Type 7, Pitch Medium
- 2 - Type 7, Pitch High
- 3 - Type 1, Pitch Low
- 4 - Type 1, Pitch Medium
- 5 - Type 1, Pitch High
- 6 - Type 3, Pitch Low
- 7 - Type 3, Pitch Medium
- 8 - Type 3, Pitch High
- 9 - Type 11, Pitch Low
- 10 - Type 11, Pitch Medium
- 11 - Type 11, Pitch High
- 12 - Type 5, Pitch Low
- 13 - Type 5, Pitch Medium
- 14 - Type 5, Pitch High
- 15 - Type 9, Pitch Low

- 16 - Type 9, Pitch Medium
- 17 - Type 9, Pitch High
- 18 - Type 8, Pitch Low
- 19 - Type 8, Pitch Medium
- 20 - Type 8, Pitch High
- 21 - Type 2, Pitch Low
- 22 - Type 2, Pitch Medium
- 23 - Type 2, Pitch High
- 24 - Type 4, Pitch Low
- 25 - Type 4, Pitch Medium
- 26 - Type 4, Pitch High
- 27 - Type 6, Pitch Low
- 28 - Type 6, Pitch Medium
- 29 - Type 6, Pitch High
- 30 - Type 12, Pitch Low
- 31 - Type 12, Pitch Medium
- 32 - Type 12, Pitch High
- 33 - Type 10, Pitch Low
- 34 - Type 10, Pitch Medium
- 35 - Type 10, Pitch High
- 37 - Off
- Other Values: Type 0 (Off)

Mii Fighter Neutral Special: 0xEFb6-b7

- 0 - Special 1
- 1 - Special 2
- 2 - Special 3

Mii Fighter Side Special: 0xEFb4-b5

- 0 - Special 1
- 1 - Special 2
- 2 - Special 3

Mii Fighter Up Special: 0xEFb2-b3

- 0 - Special 1
- 1 - Special 2
- 2 - Special 3

Mii Fighter Down Special: 0xEFb0-b1

- 0 - Special 1
- 1 - Special 2
- 2 - Special 3

Mii Fighter Hat: 0xF0

Signed 8-bit integer

- -1 - None
- 0 - Mushroom 2
- 1 - Hockey
- 2 - Demon
- 3 - Crown
- 4 - Prince
- 5 - Lady
- 6 - Sheik
- 7 - Ninja
- 8 - Silk Hat
- 9 - Mushroom 1
- 10 - Princess Zelda
- 11 - Daisy
- 12 - Togezo
- 13 - Barbara
- 14 - Peach
- 15 - Princess
- 16 - Heyho
- 17 - Maid
- 18 - Wizard
- 19 - Mario
- 20 - Meta
- 21 - Luigi
- 22 - Wario
- 23 - Waluigi
- 24 - Wanwan
- 25 - Pirate
- 26 - Bandit
- 27 - Dragon
- 28 - Link
- 29 - Majora’s Mask
- 30 - Dunban
- 31 - Cathead M
- 32 - Cathead F
- 33 - Monkeyhead M
- 34 - Monkeyhead F
- 35 - Isabelle
- 36 - Splatoon Hair M
- 37 - Splatoon Hair F
- 38 - Splatoon
- 39 - Bearhead M
- 40 - Bearhead F

- 41 - King K. Rool
- 42 - Flying Man
- 43 - Chrom
- 44 - Black Knight
- 45 - Samus
- 46 - K.K. Slider
- 47 - Toad
- 48 - Nature
- 49 - Starfox
- 50 - Captain Falcon
- 51 - Metal M
- 52 - Metal F
- 53 - Takamaru
- 54 - Ashley
- 55 - Doseisan
- 56 - Splatoon 2 M
- 57 - Splatoon 2 F
- 58 - Link Bow
- 59 - Skull Kid
- 60 - Beit
- 61 - Mario Maker
- 62 - Cappy
- 63 - Yoshi Wool
- 64 - Chibirobo
- 65 - Vince
- 66 - Dixie Kong
- 67 - Yigaclan
- 68 - Saki
- 69 - Custom Robo
- 70 - Nia
- 71 - Springman M
- 72 - Ribbongirl F
- 73 - Marx
- 74 - Robin
- 75 - Lip
- 76 - Special Forces
- 77 - Astronaut
- 78 - Labo
- 79 - Rex
- 80 - (DLC) P3Hero
- 81 - (DLC) P4Hero
- 82 - (DLC) P4Kuma
- 83 - (DLC) P5Mona
- 84 - (DLC) Tails

- 85 - (DLC) Knuckles
- 86 - (DLC) Veronica
- 87 - (DLC) Roto
- 88 - (DLC) Monk M
- 89 - (DLC) Monk F
- 90 - (DLC) Slime
- 91 - (DLC) Rocket
- 92 - (DLC) Goemon
- 93 - (DLC) Sans
- 94 - (DLC) Bruce
- 95 - (DLC) Zero
- 96 - (DLC) Ryo
- 97 - (DLC) Nakoruru
- 98 - (DLC) Iori
- 99 - (DLC) Akira
- 100 - (DLC) Jacky
- 101 - (DLC) Cuphead
- 102 - (DLC) Altair
- 103 - (DLC) Rabbids
- 104 - (DLC) X
- 105 - (DLC) Exe
- 106 - (DLC) Link Ancient

Mii Fighter Outfit: 0xF2

Signed 8-bit integer. The letter in front of the outfit indicates which Mii fighter it is for (B for Brawler, S for Swordfighter, G for Gunner). The “none” option is not selectable in-game. If outfit is edited to a value of “none”, the mii will be wearing Normal Fighter but no label will appear on the outfit box. Changing the outfit in this state may cause a crash.

- -1 - (All) None
- 0 - (B) Normal Fighter M
- 1 - (B) Normal Fighter F
- 2 - (B) Martial Arts M
- 3 - (B) Martial Arts F
- 4 - (B) Chinese M
- 5 - (B) Chinese F
- 6 - (B) Machine M
- 7 - (B) Machine F
- 8 - (B) Protector M
- 9 - (B) Protector F
- 10 - (B) Vampire M
- 11 - (B) Vampire F
- 12 - (B) Biker M
- 13 - (B) Biker F
- 14 - (B) Sbtshirt M

- 15 - (B) Sbtshirt F
- 16 - (B) Catsuit M
- 17 - (B) Catsuit F
- 18 - (B) King K. Rool M
- 19 - (B) Flying Man M
- 20 - (B) Businessman M
- 21 - (B) Businessman F
- 22 - (B) Toad M
- 23 - (B) Toad F
- 24 - (B) Captain Falcon M
- 25 - (B) Metal M
- 26 - (B) Metal F
- 27 - (B) Skull Kid M
- 28 - (B) Mario Maker M
- 29 - (B) Yoshi Wool M
- 30 - (B) Springman M
- 31 - (B) Ribbongirl F
- 32 - (B) Nia F
- 33 - (B) Maid F
- 34 - (S) Maid F
- 35 - (G) Maid F
- 36 - (B) Deacon M
- 37 - (S) Deacon M
- 38 - (G) Deacon M
- 39 - (B) Labo M
- 40 - (S) Normal Swordman M
- 41 - (S) Normal Swordman F
- 42 - (S) Pirate M
- 43 - (S) Pirate F
- 44 - (S) Ironsuit M
- 45 - (S) Ironsuit F
- 46 - (S) Ninja M
- 47 - (S) Ninja F
- 48 - (S) Sbtshirts M
- 49 - (S) Sbtshirts F
- 50 - (S) Link M
- 51 - (S) Dunban M
- 52 - (S) Monkeysuit M
- 53 - (S) Monkeysuit F
- 54 - (S) Chrom M
- 55 - (S) Black Knight M
- 56 - (S) Businessman M
- 57 - (S) Businessman F
- 58 - (S) Nature F

- 59 - (S) Takamaru M
- 60 - (S) Ashley F
- 61 - (S) Linkbow M
- 62 - (S) Vince M
- 63 - (S) Yiga Clan M
- 64 - (S) Yiga Clan F
- 65 - (S) Robin M
- 66 - (S) Lip F
- 67 - (G) Normal Gunner M
- 68 - (G) Normal Gunner F
- 69 - (G) Bandit M
- 70 - (G) Bandit F
- 71 - (G) Steam M
- 72 - (G) Steam F
- 73 - (G) Powerd M
- 74 - (G) Dragon M
- 75 - (G) Dragon F
- 76 - (G) Sbtshirtg M
- 77 - (G) Sbtshirtg F
- 78 - (G) Isabelle F
- 79 - (G) Splatoon M
- 80 - (G) Splatoon F
- 81 - (G) Bearsuit M
- 82 - (G) Bearsuit F
- 83 - (G) Samus F
- 84 - (G) K.K. Slider M
- 85 - (G) Businessman M
- 86 - (G) Businessman F
- 87 - (G) Starfox M
- 88 - (G) Splatoon 2 M
- 89 - (G) Splatoon 2 F
- 90 - (G) Chibirobo M
- 91 - (G) Custom Robo M
- 92 - (G) Special Forces M
- 93 - (G) Special Forces F
- 94 - (G) Astronaut M
- 95 - (G) Saki M
- 96 - (S) Rex M
- 97 - (S) P3Hero M
- 98 - (S) P4Hero M
- 99 - (G) Tails M
- 100 - (B) Knuckles M
- 101 - (B) Monk M
- 102 - (B) Monk F

- 103 - (S) Roto M
- 104 - (S) Veronica F
- 105 - (B) Rocket M
- 106 - (B) Rocket F
- 107 - (S) Goemon M
- 108 - (G) Sans M
- 109 - (G) Bruce M
- 110 - (S) Zero M
- 111 - (B) Ryo M
- 112 - (S) Nakoruru M
- 113 - (S) Nakoruru F
- 114 - (B) Iori M
- 115 - (B) Akira M
- 116 - (B) Jacky M
- 117 - (G) Cuphead M
- 118 - (S) Altair M
- 119 - (G) X M
- 120 - (G) Exe M
- 121 - (G) Exe F
- 122 - (S) Link Ancient M

Spirits

Note: All shown values in the spirits section are the unsigned binary converted into decimal, unless otherwise stated.

Type: 0xE3b0-b1

- 0 - Neutral
- 1 - Attack
- 2 - Defense
- 3 - Grab

Attack Stat: 0x150 - 0x151

Signed 16-bit integer. Negative values have strange effects on damage dealt.

Defense Stat: 0x152 - 0x153

Signed 16-bit integer. Negative values have strange effects on damage received.

Neutral Type Affinity: 0x1A4

Determines the amiibo's affinity for neutral type. If this is the highest value of the affinities, this amiibo is neutral-type. Feeding an amiibo a neutral type spirit will increase this value by 3, and decrease the other values by 1. This is a signed 8-bit integer.

Attack Type Affinity: 0x1A5

Determines the amiibo's affinity for attack-type. If this is the highest value of the affinities, this amiibo is attack-type. Feeding an amiibo an attack-type spirit will increase this value by 3, and decrease the other values by 1. This is a signed 8-bit integer.

Defense Type Affinity: 0x1A6

Determines the amiibo's affinity for defense-type. If this is the highest value of the affinities, this amiibo is defense-type. Feeding an amiibo a defense-type spirit will increase this value by 3, and decrease the other values by 1. This is a signed 8-bit integer.

Grab Type Affinity: 0x1A7

Determines the amiibo's affinity for grab-type. If this is the highest value of the affinities, this amiibo is grab-type. Feeding an amiibo a grab-type spirit will increase this value by 3, and decrease the other values by 1. This is a signed 8-bit integer.

Spirit Slot 1: 0xEC

All obtainable effects have (L #) notation next to them. L stands for legal and the number is the number of slots required. For more info click here.

00. None
01. Move Speed ↑ (L 1)
02. Hyper Smash Attacks (L 1)
03. Quick Smashes (U 1)
04. Jump ↑ (L 1)
05. Additional Midair Jump (L 2)
06. Lifesteal (U 3)
07. Defense ↑ (U ?)
08. Easier Dodging (L 1)
09. Easier Perfect Shield (L 1)
10. Super Armor (L 3)
11. Slow Super Armor (L 2)
12. Trade-Off Attacks ↑ (L 1)
13. Trade-Off Defense ↑ (L 1)
14. Trade-Off Speed ↑ (L 1)
15. Trade-Off Ability ↑ (L 1)
16. Critical-Health Attack ↑ (L 1)
17. Critical-Health Defense ↑ (L 1)
18. Critical-Health Stats ↑ (L 1)
19. Critical Immunity (L 2)
20. Autoheal (L 2)
21. Poison Immunity (L 2)
22. Poison Damage Reduced (L 1)
23. Poison Heals (L 3)
24. Lava-Floor Immunity (L 2)

25. Sticky-Floor Immunity (L 2)
26. Beam Sword Equipped (L 1)
27. Lip's Stick Equipped (L 1)
28. Star Rod Equipped (L 1)
29. Ore Club Equipped (L 3)
30. Home-Run Bat Equipped (U ?)
31. Ray Gun Equipped (L 1)
32. Super Scope Equipped (L 2)
33. Gust Bellows Equipped (U ?)
34. Drill Equipped (L 1)
35. Green Shell Equipped (L 1)
36. Poke Ball Equipped (U ?)
37. Master Ball Equipped (U 1)
38. Back Shield Equipped (L 1)
39. Bunny Hood Equipped (L 1)
40. Made of Metal (L 1)
41. Mouthful of Curry (L 2)
42. Franklin Badge Equipped (L 2)
43. Hammer Equipped (U ?)
44. Fairy Bottle Equipped (L 1)
45. Fire Flower Equipped (L 1)
46. Freezie Equipped (L 1)
47. Ramblin' Evil Mushroom Equipped (L 1)
48. Killing Edge Equipped (L 1)
49. 49 (U ?)
50. Physical Attack ↑ (L 1)
51. Weapon Attack ↑ (L 1)
52. Fist Attack ↑ (L 1)
53. Foot Attack ↑ (L 1)
54. Aura Attack ↑ (L 1)
55. Magic Attack ↑ (L 1)
56. PSI Attack ↑ (L 1)
57. Slash Attack ↑ (U 1)
58. Fire & Explosion Attack ↑ (L 1)
59. Darkness Attack ↑ (U 1)
60. Electric Attack ↑ (L 1)
61. Energy-Shot Attack ↑ (L 1)
62. Water & Ice Attack ↑ (L 1)
63. Magic Resist ↑ (L 1)
64. PSI Resist ↑ (L 1)
65. Slash Resist ↑ (U 1)
66. Fire/Explosion Resist ↑ (L 1)
67. Darkness Resist ↑ (U 1)
68. Bomb Resist ↑ (U 1)

69. Electric Resist ↑ (L 1)
70. Energy-Shot Resist ↑ (L 1)
71. Ice Resist ↑ (U 1)
72. Water/Freezing Resist ↑ (L 1)
73. Aura Resist ↑ (L 1)
74. Zap-Floor Immunity (L 2)
75. Slumber Immunity (L 1)
76. Ice-Floor Immunity (L 2)
77. Falling Immunity (L 1)
78. Bury Immunity (L 1)
79. Braking Ability ↑ (L 1)
80. Mobility (U ?)
81. Landing Lag ↓ (L 1)
82. Lightweight (L 1)
83. Shield Damage ↑ (L 1)
84. Air Attack ↑ (L 1)
85. Air Defense ↑ (L 1)
86. Neutral Special ↑ (L 1)
87. Side Special ↑ (L 1)
88. Up Special ↑ (L 1)
89. Down Special ↑ (L 1)
90. Strong Throw (L 1)
91. Unflinching Charged Smashes (L 2)
92. Toss & Meteor (L 1)
93. Chase Offense ↑ (U 1)
94. Critical Hit ↑ (L 1)
95. Swimmer (L 1)
96. Shield Durability ↑ (L 1)
97. Improved Escape (L 1)
98. Shield Recovery ↑ (U 1)
99. Small Unbreakable Shield (U 2)
100. Explosive Perfect Shield (U 1)
101. Battering Items ↑ (L 1)
102. Shooting Items ↑ (L 1)
103. Thrown Items ↑ (L 1)
104. KOs Heal Damage (L 2)
105. Invincibility after Eating (L 2)
106. Stats ↑ after Eating (L 1)
107. Smash Ball Keeper (U 1)
108. First-Strike Advantage (L 2)
109. Reflect Limit ↑ (U 1)
110. Running Start (L 2)
111. Final Spurt (U 1)
112. Fast Final Smash Meter (L 2)

113. Instadrop (L 2)
114. Healing Shield (L 2)
115. No Perfect Shield (U 1)
116. Extended Respawn Invincibility (U 1)
117. Floaty Jumps (L 1)
118. Skate Shoes (U 1)
119. Irreversible Controls (L 2)
120. Recovery Items ↑ (U 1)
121. Transformation Duration ↑ (L 1)
122. Undamaged Attack ↑ (L 1)
123. Undamaged Speed ↑ (L 1)
124. Undamaged Attack & Speed ↑ (L 1)
125. Smash Aura Stats ↑ (U 1)
126. Smash Aura Autoheal (U 1)
127. Edge Grab ↑ (U 1)
128. Impact Run (L 1)
129. Smash Ball Crusher (U 1)
130. Lava-Floor Resist (L 1)
131. Item Gravitation (L 1)
132. Appeal Heal (U 1)
133. Chance of Double Final Smash (L 2)
134. Double Final Smash (L 3)
135. Ray Gun Master (U 2)
136. Beam Sword Master (U 2)
137. Metal and Giant (L 3)
138. Giant (L 2)
139. Dash Attack ↑ (L 1)
140. Armor Knight (L 2)
141. Backstabber (U 1)
142. Energy Shot Attack/Resistance ↑ (L 2)
143. Hammer Duration ↑ (L 1)
144. Boomerang Equipped (L 1)
145. Item Attack ↑ (U ?)
146. Assists ↑ (U 1)
147. Fire & Ice Attack ↑ (U 1)
148. Fire Resist ↑ (U 2)
149. Water Resist ↑ (U 2)
150. Item Drop Damage ↑ (U 1)
151. Perfect-Shield Reflect (L 1)
152. Weapon Attack & Move Speed ↑ (L 2)
153. Shooting Attack ↑ (L 1)
154. Charge Speed & Power ↑ (U 3)
155. Dark Screen Immunity (U 1)
156. Screen-Flip Immunity (L 2)

157. Fog Immunity (L 2)
158. Gravity-Change Immunity (L 2)
159. Stamina ↑ (L 1)
160. Strong-Wind Resist (L 1)
161. Strong-Wind Immunity (L 2)
162. Critical-Health Healing (L 2)
163. Special-Move Power ↑ (L 1)
164. Type Neutralizer (U 1)
165. Bob-omb Equipped (L 1)
166. Hothead Equipped (L 2)
167. Super Leaf Equipped (L 1)
168. Super Launch Star Equipped (L 1)
169. Beastball Equipped (L 1)
170. Death's Scythe Equipped (L 1)
171. Mr. Saturn Equipped (L 1)
172. Unira Equipped (L 1)
173. Rocket Belt Equipped (L 1)
174. Black Hole Equipped (L 2)
175. Invisibility Equipped (U 1)
176. Stats ↑↑ after Eating (L 2)
177. Item Attack ↑↑ (U 1)
178. Critical-Health Stats ↑↑ (L 2)
179. Critical Hit ↑↑ (L 2)
180. Great Autoheal (L 3)
181. Steel Diver Equipped (L 2)
182. Banana Gun Equipped (L 1)
183. Rage Blaster Equipped (L 1)
184. Staff Equipped (L 1)
185. Fire Bar Equipped (L 1)
186. Screw Attack Equipped (L 2)
187. Bomber Equipped (L 1)
188. Cucco Equipped (U 1)
189. Neutral Attack ↑ (U 1)
190. Neutral Attack ↑↑ (U 1)
191. Tilt Attack ↑ (U 1)
192. Tilt Attack ↑↑ (U 1)
193. Air Attack ↑↑ (U 1)
194. Mighty Throw (U 1)
195. Special-Move Power ↑↑ (U 1)
196. Super Easy Dodging (U 1)
197. 197 (U ?)
198. Landing Lag ↓↓ (U 1)
199. Become Heavy (U 1)
200. Meteor Smashes ↑ (U 1)

201. Poisoned Smash (U 1)
202. No Penalty for Continuous Dodging (U 1)
203. Airborne Endurance (U 1)
204. Sprinting Endurance (U 1)
205. Perfect-Shield Recovery (U 1)
206. Masterful Fall Break (U 1)
207. Healing-Item Attraction (U 1)
208. Attack ↑ When Healthy (U 1)
209. Defense ↑ When Healthy (U 1)
210. Endless Smash Holding (U 1)
211. Heal with Smash Attacks (U 1)
212. Activities ↑ (U 1)
213. Giant Killer (L 1)
214. Metal Killer (L 1)
215. Assist Killer (L 1)
216. Jam FS Charge (L 2)
217. Weapon Resist ↑ (L 2)
218. Hyper Smash Attacks (U 1)
219. Neutral Attack ↑ (U 1)
220. Tilt Attack ↑ (U 1)
221. Special-Move Power ↑ (U 1)
222. Air Attack ↑ (U 1)
223. 223 (U ?)
224. 224 (U ?)
225. 225 (U ?)
226. 226 (U ?)
227. Item Autograb (L 1)
228. Team Power Up (L 2)
229. Weight ↑↑ (U 1)
230. Poison Power Up (L 3)
231. Critical Fast Final Smash Meter ↑↑ (L 3)
232. Critical-Health Healing ↑↑ (L 3)
233. Critical Super Giant (L 3)
234. Mouthful of Curry ↑↑ (L 3)
235. Final Smash ↑ (L 2)
236. Critical Healing & Metal (L 2)
237. Fist & Foot Attack ↑ (U 1)
238. Weapon Attack & Move Speed ↑ ↑ (L 3)
239. 239 (U ?)
240. 240 (U ?)
241. 241 (U ?)
242. 242 (U ?)
243. 243 (U ?)
244. 244 (U ?)

245. 245 (U ?)
246. 246 (U ?)
247. 247 (U ?)
248. 248 (U ?)
249. 249 (U ?)
250. 250 (U ?)
251. 251 (U ?)
252. 252 (U ?)
253. 253 (U ?)
254. 254 (U ?)
255. 255 (U ?)

Spirit Slot 2: 0xED

See Spirit Slot 1. If Spirt Slot 1 takes up two or three slots, nothing in this slot will be counted.

Spirit Slot 3: 0xEE

See Spirit Slot 1. If Spirt Slot 1 takes up three slots or if Spirit Slot 2 takes two slots, nothing in this slot will be counted.

Mii

Fighter Mii: 0xF4-0x14B

Stored in the Switch mii format. More information about the mii format can be found here. If the amiibo is not a mii fighter, this section will be all zeros.

Experience

Note: All shown values in the level section are the unsigned binary converted into decimal, unless otherwise stated.

Level Experience: 0x14C-0x14D

Determines the displayed level of the amiibo, which only affects the stat boosts it receives. When between values, the lower level number is shown.

- 0 - 1
- 8 - 2
- 22 - 3
- 41 - 4
- 63 - 5
- 90 - 6
- 120 - 7
- 155 - 8

- 195 - 9
- 238 - 10
- 284 - 11
- 330 - 12
- 376 - 13
- 426 - 14
- 476 - 15
- 528 - 16
- 580 - 17
- 632 - 18
- 684 - 19
- 737 - 20
- 790 - 21
- 843 - 22
- 896 - 23
- 950 - 24
- 1004 - 25
- 1058 - 26
- 1112 - 27
- 1167 - 28
- 1222 - 29
- 1277 - 30
- 1339 - 31
- 1406 - 32
- 1478 - 33
- 1555 - 34
- 1637 - 35
- 1724 - 36
- 1816 - 37
- 1910 - 38
- 2012 - 39
- 2115 - 40
- 2220 - 41
- 2329 - 42
- 2459 - 43
- 2619 - 44
- 2799 - 45
- 2999 - 46
- 3209 - 47
- 3429 - 48
- 3669 - 49
- 3912 - 50

CPU Experience: 0x14E-0x14F

Determines the hidden CPU level of the amiibo. When between values, the lower level number is shown.

- 0 - 1
- 63 - 2
- 210 - 3
- 434 - 4
- 749 - 5
- 1141 - 6
- 1603 - 7
- 2065 - 8
- 2765 - 9

Miscellaneous

Gift: 0x156-0x157

Unsigned 16-bit integer value that determines how many rewards you get when scanning the amiibo.

Journey Wins: 0x158-0x159

Unsigned 16-bit integer value that determines how many journey wins you have. When a win happens while the amiibo has 65,535 wins, the value overflows back to 0.

Fighter Experience: 0x15A-0x165

Anytime your amiibo fights a new character, a bit gets set to mark the character as being played against. 89 bits are used to keep track of this, where each bit corresponds to a character's fighter number. The reason this feature exists is that your amiibo gets slightly more experience for fighting against a new character (Note: Learning has to be turned on for fighter experience bits to be set).

- 0x15Ab0 - Mario
- 0x15Ab1 - Donkey Kong
- 0x15Ab2 - Link
- 0x15Ab3 - Samus
- 0x15Ab4 - Dark Samus
- 0x15Ab5 - Yoshi
- 0x15Ab6 - Kirby
- 0x15Ab7 - Fox
- 0x15Bb0 - Pikachu
- 0x15Bb1 - Luigi
- 0x15Bb2 - Ness
- 0x15Bb3 - Captain Falcon
- 0x15Bb4 - Jigglypuff

- 0x15Bb5 - Peach
- 0x15Bb6 - Daisy
- 0x15Bb7 - Bowser
- 0x15Cb0 - Ice Climbers
- 0x15Cb1 - Sheik
- 0x15Cb2 - Zelda
- 0x15Cb3 - Dr. Mario
- 0x15Cb4 - Pichu
- 0x15Cb5 - Falco
- 0x15Cb6 - Marth
- 0x15Cb7 - Lucina
- 0x15Db0 - Young Link
- 0x15Db1 - Ganondorf
- 0x15Db2 - Mewtwo
- 0x15Db3 - Roy
- 0x15Db4 - Chrom
- 0x15Db5 - Mr. Game & Watch
- 0x15Db6 - Meta Knight
- 0x15Db7 - Pit
- 0x15Eb0 - Dark Pit
- 0x15Eb1 - Zero Suit Samus
- 0x15Eb2 - Wario
- 0x15Eb3 - Snake
- 0x15Eb4 - Ike
- 0x15Eb5 - Pokémon Trainer
- 0x15Eb6 - Diddy Kong
- 0x15Eb7 - Lucas
- 0x15Fb0 - Sonic
- 0x15Fb1 - King Dedede
- 0x15Fb2 - Olimar
- 0x15Fb3 - Lucario
- 0x15Fb4 - R.O.B.
- 0x15Fb5 - Toon Link
- 0x15Fb6 - Wolf
- 0x15Fb7 - Villager
- 0x160b0 - Mega Man
- 0x160b1 - Wii Fit Trainer
- 0x160b2 - Rosalina & Luma
- 0x160b3 - Little Mac
- 0x160b4 - Greninja
- 0x160b5 - Palutena
- 0x160b6 - Pac-Man
- 0x160b7 - Robin
- 0x161b0 - Shulk

- 0x161b1 - Bowser Jr.
- 0x161b2 - Duck Hunt
- 0x161b3 - Ryu
- 0x161b4 - Ken
- 0x161b5 - Cloud
- 0x161b6 - Corrin
- 0x161b7 - Bayonetta
- 0x162b0 - Richter
- 0x162b1 - Inkling
- 0x162b2 - Ridley
- 0x162b3 - King K. Rool
- 0x162b4 - Simon
- 0x162b5 - Isabelle
- 0x162b6 - Incineroar
- 0x162b7 - Mii Brawler
- 0x163b0 - Mii Swordfighter
- 0x163b1 - Mii Gunner
- 0x163b2 - Piranha Plant
- 0x163b3 - Joker
- 0x163b4 - Hero
- 0x163b5 - Banjo & Kazooie
- 0x163b6 - Terry
- 0x163b7 - Byleth
- 0x164b0 - Min Min
- 0x164b1 - Steve
- 0x164b2 - Sephiroth
- 0x164b3 - Pyra/Mythra
- 0x164b4 - Kazuya
- 0x164b5 - Sora

Behavior

*Note: All values are interpreted as percentages of the unsigned binary values. So if the value is 0110, it is interpreted as 40% (6/15 * 100).*

Near (RANGE_NEAR): 0x168b1-b7

Handles how close the amiibo wants to be to the target.

Offensive (OFFENSIVE): 0x168b0 + 0x169b2-b7

Handles the likely hood of the amiibo choosing to attack or defend.

Grounded (GROUNDED): 0x169b0-b1 + 0x16Ab3-b7

Handles if the amiibo should choose to stay grounded.

Attack Out Cliff (ATTACK_OUT_CLIFF): 0x16Ab0-b2 + 0x16Bb5-b7

Handles if the amiibo should choose to attack off the stage.

Dash (DASH): 0x16Bb0-b4 + 0x16Cb6-b7

Handles if the amiibo should choose to dash.

Return To Cliff (RETURN_TO_CLIFF): 0x16Cb0-b5

Handles if the amiibo will favor recovering to ledge rather than landing on stage.

Air Offensive (AIR_OFFENSIVE): 0x16Db2-b7

Handles if the amiibo should choose to attack when landing from high above.

Cliffer (CLIFFER): 0x16Db0-b1 + 0x16Eb4-b7

Handles if the amiibo should hang from ledge when edgeguarding.

Feint Master (FEINT_MASTER): 0x16Eb0-b3 + 0x16Fb5-b7

Handles if the amiibo should choose to “bait” out attacks. This may involve dash dancing/fox trotting.

Feint Counter (FEINT_COUNTER): 0x16Fb0-b4 + 0x170b6-b7

Handles if the amiibo should counterattack. Lower values tend to mean the amiibo dodges more, while higher values tend to mean the amiibo attempts to counterattack.

Feint Shooter (FEINT_SHOOTER): 0x170b0-b5 + 0x171b7

Handles if the amiibo should counter a projectile. It may also involve projectile camping/defensiveness/usager; needs more research.

Grab (CATCHER): 0x171b0-b6

Handles if the amiibo should choose to grab.

100 Attacker (_100_ATTACKER): 0x172b2-b7

Handles if the amiibo should initiate a rapid jab.

100 Keeper (_100_KEEPER): 0x172b0-b1 + 0x173b4-b7

Handles if the amiibo should continue a rapid jab.

Attack Cancel (ATTACK_CANCEL): 0x173b0-b3 + 0x174b6-b7

Handles if the amiibo should choose to cancel its jabs, such as doing 2 jabs and stopping.

Smash Holder (SMASH_HOLDER): 0x174b0-b5 + 0x175b7

Handles if the amiibo should choose to charge a smash attack.

Dash Attack (DASH_ATTACKER): 0x175b0-b6

Handles if the amiibo should choose to dash attack.

Critical Hitter (CRITICAL_HITTER): 0x176b2-b7

Handles if the amiibo should use attacks with the 'Special Zoom' effect (Such as Falcon Punch).

Meteor Smasher (METEOR_SMASHER): 0x176b0-b1 + 0x177b4-b7

Handles if the amiibo should use moves that spike.

Shield Master (SHIELD_MASTER): 0x177b0-b3 + 0x178b5-b7

Handles the overall behavior of shielding.

Perfect Shield (JUST_SHIELD_MASTER): 0x178b0-b4 + 0x179b7

Handles if the amiibo should choose to parry.

Shield Grab (SHIELD_CATCH_MASTER): 0x179b1-b6

Handles if the amiibo should grab out of shield.

Item Collector (ITEM_COLLECTOR): 0x179b0 + 0x17Ab4-b7

Handles if the amiibo should choose to collect an item.

Item Throw to Target (ITEM_THROW_TO_TARGET): 0x17Ab0-b3 + 0x17Bb7

Handles if the amiibo should choose to throw an item at a target.

Dragoon Collector (DRAGOON_COLLECTOR): 0x17Bb3-b6

Handles if the amiibo should choose to collect Dragoon parts.

Smash Ball Collector (SMASHBALL_COLLECTOR): 0x17Bb0-b2 + 0x17Cb7

Handles if the amiibo should choose to attack the smash ball.

Hammer Collector (HAMMER_COLLECTOR): 0x17Cb3-b6

Handles if the amiibo should choose to pick up the hammer item.

Special Flagger (SPECIAL_FLAGGER): 0x17Cb0-b2 + 0x17Db7

Handles if the amiibo should choose to use the one-up flag.

Item Swinger (ITEM_SWINGER): 0x17Db2-b6

Handles if the amiibo should choose to attack with an item.

Homerun Batter (HOMERUN_BATTER): 0x17Db0-b1 + 0x17Eb6-b7

Handles if the amiibo should choose to use the strong attack of the homerun bat.

Club Swinger (CLUB_SWINGER): 0x17Eb2-b5

Handles if the amiibo should choose to use the strong attack of the Ore club

Death Swinger (DEATH_SWINGER): 0x17Eb0-b1 + 0x17Fb6-b7

Handles if the amiibo should choose to use the strong attack of the Death scythe

Item Shooter (ITEM_SHOOTER): 0x17Fb1-b5

Handles if the amiibo should choose to shoot a shootable item

Carrier Breaker (CARRIER_BREAKER): 0x17Fb0 + 0x180b4-b7

Handles if the amiibo should choose to stop carrying an item.

Charger (CHARGER): 0x180b0-b3 + 0x181b7

Handles if the amiibo should charge a chargeable attack. This possibly includes Inkling's ability to refill ink.

Taunt (APPEAL): 0x181b2-b6

Handles if the amiibo should choose to taunt.

Fighter_1 (FIGHTER_1): 0x181b0-b1 + 0x182b3-b7

Contains Additional Fighter Info. Not all characters have information here, only the following characters do.

- This value is zair for:
  - Dark Samus
  - Lucas
  - Luigi
  - Samus
  - Toon Link
  - Young Link
  - Zero Suit Samus
- Crackshoot for Terry
- Forward Smash usage while buffed by Revenge for Incineroar (all add to 100)
- Grounded Bullet Arts usage for Bayonetta
- Neutral Special Bite usage for Corrin
- Jump Monado Art usage for Shulk (all add to 100)

- Probability of selecting buffs from menu for Hero
- Whether Rosalina prefers to keep luma close or away
- Light Jab usage for Ryu
- Light Jab usage for Ken
- Back Tilt usage for Kazuya
- Unknown for Pyra/Mythra

Fighter_2 (FIGHTER_2): 0x182b0-b2 + 0x183b4-b7

Contains Additional Fighter Info. Not all characters have information here, only the following characters do.

- Aerial Crackshoot for Terry
- Up Smash usage while buffed by Revenge for Incineroar (all add to 100)
- Aerial Bullet Arts usage for Bayonetta
- Speed Monado Art usage for Shulk (all add to 100)
- Hocus Pocus menu usage for Hero
- Light Forward Tilt usage for Ryu
- Light Forward Tilt usage for Ken
- Crouch Attack usage for Kazuya
- Unknown for Toon Link
- Unknown for Pyra/Mythra

Fighter_3 (FIGHTER_3): 0x183b0-b3 + 0x184b5-b7

Contains Additional Fighter Info. Not all characters have information here, only the following characters do.

- Down Smash usage while buffed by Revenge for Incineroar (all add to 100)
- Shield Monado Art usage for Shulk (all add to 100)
- Light Up Tilt usage for Ryu
- Light Up Tilt usage for Ken
- Dash Cancelling Attacks usage for Kazuya
- Unknown for Pyra/Mythra

Fighter_4 (FIGHTER_4): 0x184b0-b4 + 0x185b6-b7

Contains Additional Fighter Info. Not all characters have information here, only the following characters do.

- Side Special usage while buffed by Revenge for Incineroar (all add to 100)
- Buster Monado Art usage for Shulk (all add to 100)
- Light Down Tilt usage for Ryu
- Light Down Tilt usage for Ken

Fighter_5 (FIGHTER_5): 0x185b0-b5 + 0x186b7

Contains Additional Fighter Info. Not all characters have information here, only the following characters do.

- Other move usage while buffed by Revenge for Incineroar (all add to 100)

- Smash Monado Art usage for Shulk (all add to 100)
- Shakunetsu Hadoken usage for Ryu
- Round House Kick usage for Ken

Targeting

*Note: All values are interpreted as percentages of the unsigned binary values. So if the value is 0110, it is interpreted as 40% (6/15 * 100). Stage Enemy is implicitly encoded as 100 - the sum of all other grounded moves. Stage Enemy handles if the amiibo should focus on the stage boss/enemy.*

Advantageous Fighter (ADVANTAGIOUS_FIGHTER): 0x186b0-b6

Handles if the amiibo should target the winning player.

Weaken Fighter (WEAKEN_FIGHTER): 0x187b1-b7

Handles if the amiibo should target the weakest player.

Revenge (REVENGE): 0x187b0 + 0x188b2-b7

Handles if the amiibo should target someone who recently killed them or their ally.

Grounded Moves

*Note: All values are interpreted as percentages of the unsigned binary values. So if the value is 0110, it is interpreted as 40% (6/15 * 100). Jab is implicitly encoded as 100 - the sum of all other grounded moves. The sum of all grounded moves should be 100. Grab and Dash Attack are not included in this sum.*

Forward Tilt (ATTACK_S): 0x188b0-b1 + 0x189b0-b7

Probability of a forward tilt occurring when the Figure Player decides to offensively use a grounded move.

Up Tilt (ATTACK_HI): 0x18Ab0-b7 + 0x18Bb6-b7

Probability of an up tilt occurring when the Figure Player decides to offensively use a grounded move.

Down Tilt (ATTACK_LW): 0x18Bb0-b5 + 0x18Cb4-b7

Probability of a down tilt occurring when the Figure Player decides to offensively use a grounded move.

Forward Smash (SMASH_S): 0x18Cb0-b3 + 0x18Db2-b7

Probability of a forward smash occurring when the Figure Player decides to offensively use a grounded move.

Up Smash (SMASH_HI): 0x18Db0-b1 + 0x18Eb0-b7

Probability of an up smash occurring when the Figure Player decides to offensively use a grounded move.

Down Smash (SMASH_LW): 0x18Fb0-b7 + 0x190b6-b7

Probability of a down smash occurring when the Figure Player decides to offensively use a grounded move.

Neutral Special (SPECIAL_N): 0x190b0-b5 + 0x191b4-b7

Probability of a neutral special occurring when the Figure Player decides to offensively use a grounded move.

Side Special (SPECIAL_S): 0x191b0-b3 + 0x192b2-b7

Probability of a side special occurring when the Figure Player decides to offensively use a grounded move.

Up Special (SPECIAL_HI): 0x192b0-b1 + 0x193b0-b7

Probability of an up special occurring when the Figure Player decides to offensively use a grounded move.

Down Special (SPECIAL_LW): 0x194b0-b7 + 0x195b6-b7

Probability of a down special occurring when the Figure Player decides to offensively use a grounded move.

Aerial Moves

*Note: All values are interpreted as percentages of the unsigned binary values. So if the value is 0110, it is interpreted as 40% (6/15 * 100). Neutral Air is implicitly encoded as 100 - the sum of all other aerial moves. The sum of all aerial moves should be 100.*

Forward Air (ATTACK_AIR_F): 0x195b0-b5 + 0x196b5-b7

Probability of a forward air occurring when the Figure Player decides to offensively use an aerial move.

Back Air (ATTACK_AIR_B): 0x196b0-b4 + 0x197b4-b7

Probability of a back air occurring when the Figure Player decides to offensively use an aerial move.

Up Air (ATTACK_AIR_HI): 0x197b0-b3 + 0x198b3-b7

Probability of an up air occurring when the Figure Player decides to offensively use an aerial move.

Down Air (ATTACK_AIR_LW): 0x198b0-b2 + 0x199b2-b7

Probability of a down air occurring when the Figure Player decides to offensively use an aerial move.

Aerial Neutral Special (SPECIAL_AIR_N): 0x199b0-b1 + 0x19Ab1-b7

Probability of a neutral special occurring when the Figure Player decides to offensively use an aerial move.

Aerial Side Special (SPECIAL_AIR_S): 0x19Ab0 + 0x19Bb0-b7

Probability of a side special occurring when the Figure Player decides to offensively use an aerial move.

Aerial Up Special (SPECIAL_AIR_HI): 0x19Cb0-b7 + 0x19Db7

Probability of an up special occurring when the Figure Player decides to offensively use an aerial move.

Aerial Down Special (SPECIAL_AIR_LW): 0x19Db0-b6 + 0x19Eb6-b7

Probability of a down special occurring when the Figure Player decides to offensively use an aerial move.

Additional Behavior

*Note: All values are interpreted as percentages of the unsigned binary values. So if the value is 0110, it is interpreted as 40% (6/15 * 100). Neutral Air dodge and Side Taunt are implicitly encoded as 100 - the sum of all other Air Dodge values and 100 - the sum of all other directional Taunt values. The sums of all Air Dodge and Taunt values should each be 100.*

Forward Air Dodge (ESCAPE_AIR_FORWARD): 0x19Eb0-b5 + 0x19Fb6-b7

Probability of a forward air dodge occurring when the Figure Player decides to air dodge.

Backward Air Dodge (ESACPE_AIR_BACKWARD): 0x19Fb0-b5 + 0x1A0b6-b7

Probability of a backward air dodge occurring when the Figure Player decides to air dodge.

Up Taunt (APPEAL_HI): 0x1A0b0-b5 + 0x1A1b7

Probability of an up taunt occurring when the Figure Player decides to taunt.

Down Taunt (APPEAL_LW): 0x1A1b0-b6

Probability of a down taunt occurring when the Figure Player decides to taunt.

FAQ

Where is Jab/Neutral Air/Neutral Air Dodge/Side Taunt?

Please go and read the note at the beginning of each area. These actions are implicitly encoded through the other sections in their respective areas.

Is Jab/Neutral Air/Neutral Air Dodge/Side Taunt teachable?

Yes, when one of these actions is performed, other sections in their respective areas decrease. This indirectly increases the probability of itself occurring.

Where is the personality of the amiibo?

The personality is not explicitly stored in the bin. It is calculated when scanned based on the behavior values. This document has more about personality.

Where is ____? I know you can teach amiibo ____.

If something is not listed that you can teach amiibo, then it is most likely indirectly influenced by other sections. An example is rolling. You can definitely teach an amiibo to roll more, but there is no specific byte that controls it. It most likely is determined by offensive or other values.

What about the previous Amiibox regions? Were they wrong?

All behavior and moves in Amiibox were our best guesses at where values were. Since we didn't know how the values were being interpreted, this made it hard to accurately map out where things are. So while most Amiibox regions got the general area right, they weren't precisely correct.

How can I view my amiibo's values?

The easiest way to view your amiibo's values is to use jozz's bot bint (It is in all servers listed in the Contact Me/Additional Questions section). DM it !bineval with a bin attached to view it's values.

How can I edit these values?

Jozz and I developed a tool to edit these values on amiibo. **Edited amiibo are not allowed in tournaments unless the tournament host explicitly allows them.** You can download the tool here: https://github.com/jozz024/smash-amiibo-editor/releases/.

Where can I learn more about Smash Ultimate's AI?

Check out this post from williamatherton!
https://www.reddit.com/r/SmashBrosUltimate/comments/1hdk89a/explanation_of_how_cpus_amiibos_work_in_smash/

Contact Me/Additional Questions

You can get in touch with me on discord @mide_. I also have a github site that features tons of useful ssbu amiibo information https://mide-s.github.io/amiibo/.
Have questions about amiibo training? Check out USAC.