

## Emulator - Emulator Issues #12438

### AD16 implementation is incorrect

03/01/2021 09:18 PM - pokechu22

<b>Status:</b> New	<b>% Done:</b> 0%
<b>Priority:</b> Normal	
<b>Assignee:</b>	
<b>Category:</b>	
<b>Target version:</b>	
<b>Operating system:</b> N/A	<b>Relates to performance:</b> No
<b>Issue type:</b> Bug	<b>Easy:</b> No
<b>Milestone:</b>	<b>Relates to maintainability:</b> No
<b>Regression:</b> No	<b>Regression start:</b>
<b>Relates to usability:</b> No	<b>Fixed in:</b>
<b>Description</b>	
<b>Game Name?</b>	
GameCube IPL.	
<b>What's the problem? Describe what went wrong.</b>	
<p>Dolphin's implementation of the <a href="#">AD16</a> is incorrect. The AD16Reg union is defined as union AD16Reg { u32 U32 = 0; u32 U8[4]; }; but it needs to be union AD16Reg { u32 U32 = 0; u8 U8[4]; }; as the U8 field is intended to access data one byte at a time. Due to this incorrect implementation, the <a href="#">init code</a> returns 00000000 instead of 04120000, and the AD16 is not detected.</p> <p>However, note that if this is fixed, the IPL will fail to start, because BS1 performs a memory test that overwrites the entirety of memory (including BS1). On hardware, it <a href="#">boots from fff00100</a>, which is <a href="#">mapped to an EXI transfer</a> (and this only works with the de-scrambling due to icache). Since dolphin instead <a href="#">loads it into memory at 81200000</a>, the data is clobbered (and icache doesn't seem to save it for some reason). (Note also that BS1 loads BS2, so dolphin has no reason to load BS2 itself.)</p> <p>I have the start of a set of changes to fix this, but since I've got no idea when I'll be done with then, I figured I'd report this just so that it's documented.</p>	
<b>Is the issue present in the latest development version?</b>	
Yes, 5.0-13698.	
<b>Is the issue present in the latest stable version?</b>	
Based on code only, it should also be present in 5.0 (and in fact since the initial megacommit).	