**BUFFER ISSUE RESOLUTION DOCUMENT (BIRD)**

**BIRD NUMBER:** 166.4

**ISSUE TITLE:** Resolving problems with Redriver Init Flow

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**DATE ACCEPTED:** Rejected April 22, 2022

**ANALYSIS PATH/DATA THAT LED TO SPECIFICATION:**

As currently written, the statistical reference flow for a Redriver makes the incorrect assumption that the downstream Rx equalization is determined from the downstream Tx and the downstream channel. For the downstream Rx to properly determine its equalization, the impulse response input to the downstream Rx must also include the impulse response output of the upstream Rx.

The proposed revision corrects the Redriver statistical simulation flow by:

* Convolving the upstream equalization with the Redriver Tx IR output instead of convolving the upstream equalization with the downstream Rx output.

Make the changes indicated below on page 244:

Make following changes

Step 6. The output of step 5 is presented to Rx2’s AMI\_Init function and Rx2’s AMI\_Init function is executed.

Step 7a. Redriver: The EDA tool convolves impulse responses returned by Rx1’s AMI\_Init in step 3 and by Rx2’s AMI\_Init in step 6 to obtained the full channel impulse response and uses it to perform statistical simulation.

Note: The Rx2 executable model file writer for the downstream channels with Redrivers should keep in mind that the impulse response that is presented to the Rx2 AMI\_Init function does not include the effects of the upstream equalization. Therefore, the Rx AMI\_Init function will not be able to perform accurate optimization in the absence of the upstream channel characteristics and/or equalization effects. For this reason, the parameters of the Rx AMI\_Init function should always default to valid values or have a mechanism to accept user-defined coefficients and allow the user to turn off any automatic optimization routines to ensure successful simulations.

Step 7b. Retimer: The EDA tool uses the impulse responses returned by Rx1’s AMI\_Init in step 3 to perform a statistical simulation of channel 1. The EDA tool uses the impulse responses returned by Rx2’s AMI\_Init in step 6 to perform a statistical simulation of channel 2.

Add the following as alternative steps to Step 6, Step 7a and Step 7b

Step 6a. Redriver: The simulation platform convolves the impulse response returned with Rx1’s AMI\_Init in step 3 by the output of step 5 and presents the results to Rx2’s AMI\_Init function and Rx2’s AMI\_Init function is executed.

Step 6b. Retimer: The output of step 5 is presented to Rx2’s AMI\_Init function and Rx2’s AMI\_Init function is executed.

Step 7a. Redriver: The simulation platform uses the impulse responses returned by Rx2’s AMI\_Init in step 6a to obtain the full channel impulse response and uses it to perform statistical simulation.

Step 7b. Retimer: The simulation platform uses the impulse responses returned by Rx1’s AMI\_Init in step 3 to perform a statistical simulation of channel 1. The simulation platform uses the impulse responses returned by Rx2’s AMI\_Init in step 6b to perform a statistical simulation of channel 2.