**BUFFER ISSUE RESOLUTION DOCUMENT (BIRD)**

**BIRD NUMBER:** 218

**ISSUE TITLE:** Designator Pin List Relaxation

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**DEFINITION OF THE ISSUE:**

Under the [Designator Pin List] keyword, the IBIS v7.1 specification states that: “All pin\_name pins for each designator are required to be listed.” (pg. 367). This can significantly inflate the size of EMD models when the EMD model does not describe electrical connections to all designator pins. This wastefulness can grow quite large when the same device (e.g., an IBIS die-model) is used multiple times in a multi-chip module, because the unused pin names must be listed repeatedly for every one of the designator instances.

To make matters worse, since signal\_name-s have a specific role in the context of EMD models to define electrical paths (modeled connections) between EMD pins and designator pins, the model maker must invent unique signal names for every one of the unused designator pin names to avoid unintentional connections between them (“I/O pins in the [EMD Pin List] and the Designator Pin List that have the same signal\_name are considered “connected” by the content of the [EMD Model].”, pg. 361).

**SUMMARY OF PROPOSED CHANGES:**

Remove the requirement of having to list “all pin\_name pins for each designator” in the [Designator Pin List] keyword.

**PROPOSED CHANGES:**

On pg. 367, replace the following text:

“The keyword and the list of its subparameters shall be followed by as many rows of information as the combined number of pins found in all of the designators listed under the [EMD Designator List] keyword. All pin\_name pins for each designator are required to be listed.”

With:

“The keyword and the list of its subparameters shall be followed by rows of information containing all designator pins referenced by terminal lines found in all the EMD models contained by EMD Sets and referenced by all EMD Groups found in the .emd file. Designator pin names which are not referenced by any terminal line Qualifier\_entry in any of the EMD models may optionally be listed under the [Designator Pin List] keyword.”

On pg. 368, replace the following text:

“The third column (signal\_type) is required for rail pins. The allowed values for this third column (as defined in Section 3.2, “SYNTAX RULES”) are:

POWER - reserved model name, used with power supply pins

GND - reserved model name, used with ground pins

As described in Section 3.2, “SYNTAX RULES” the reserved words “GND” and “POWER” are case-insensitive.

If a pin has a signal\_type POWER, then all other pins with the same signal\_name as this pin shall have signal\_type POWER. If a pin has signal\_type GND, then all other pins with the same signal\_name as this pin shall have signal\_type GND.”

With:

“The third column (signal\_type) is required for rail pins or for designator pins that have nothing connected to them from any of the EMD models. The allowed values for this third column (as defined in Section 3.2, “SYNTAX RULES”) are:

POWER - reserved model name, used with power supply pins

GND - reserved model name, used with ground pins

NC - reserved model name, used with no-connect pins

“NC” is a legal signal\_type and indicates that the pin is a “no-connect”. As described in Section 3.2, “SYNTAX RULES” the reserved words “GND”, “POWER”, and “NC” are case-insensitive.

If a pin has a signal\_type POWER, then all other pins with the same signal\_name as this pin shall have signal\_type POWER. If a pin has signal\_type GND, then all other pins with the same signal\_name as this pin shall have signal\_type GND. If a pin has signal\_type NC, then the designator pin and signal\_name shall not appear on any of the terminal lines of any EMD Model. The use of signal\_type NC allows the model maker to document designator pins even if no connections are made to them from any EMD Model.”

On pg. 380, replace the following text:

Qualifier\_entry

The <Qualifier\_entry>, shown in angle brackets, is the name required for the following Terminal\_type\_qualifiers:

 pin\_name <pin\_name\_entry>

 signal\_name <signal\_name\_entry>

 bus\_label <bus\_label\_entry>

With:

Qualifier\_entry

The <Qualifier\_entry>, shown in angle brackets, is the name required for the following Terminal\_type\_qualifiers:

 pin\_name <pin\_name\_entry>

 signal\_name <signal\_name\_entry>

 bus\_label <bus\_label\_entry>

Designator pin names or designator signal names whose signal\_type is “NC” are prohibited to appear as a <pin\_name\_entry>.

**BACKGROUND INFORMATION/HISTORY:**

The Advanced Technology Modeling Task Group discussed this topic on January 5, 2022 and agreed that a BIRD should be written to remove the requirement of having to list “all pin\_name pins for each designator” in the [Designator Pin List] keyword.