**BUFFER ISSUE RESOLUTION DOCUMENT (BIRD)**

**BIRD NUMBER:** 185.1

**ISSUE TITLE:** Section 3 Reserved Word Guideline Update

**REQUESTOR:**  Bob Ross, Teraspeed Labs

**DATE SUBMITTED:** September 13, 2016

**DATE REVISED:** October 14, 2016

**DATE ACCEPTED:**

**DEFINITION OF THE ISSUE:**

Section 3, Guideline 2 on page 9 for reserved words is too restrictive since (as the IBIS document has evolved) such words can occur in other places. Note the ibischk V1.0 parser strictly enforced the stated rule and disallowed the usage of such reserved words as GND as a [Pin] keyword signal\_name. The subsequent parsers relaxed this restriction for practical reasons.

**SOLUTION REQUIREMENTS:**

The IBIS specification must meet these requirements:

**Table 1: Solution Requirements**

|  |  |
| --- | --- |
| **Requirement** | **Notes** |
| 1. Correct Section 3, Guideline 2 on page 9 "The following words are reserved words and must not be used for any other purposes in the document:" | The rule is too-restrictive and not enforced |
| 1. Make clear that case-insensitive reserved words can exist in other locations as reserved words, but the same words can also appear as case-sensitive entries in other locations. | Example, "gnd" can appear as a signal\_name or a pin\_name under [Pin], or as bus\_label entries under [Pin Mapping] |

(Enumerate each requirement in the table above, adding rows as needed.)

**SUMMARY OF PROPOSED CHANGES:**

[Pin] keyword Usage Rules adds some editorial text and also adds a new rule listed below.

**Table 2: IBIS Keywords, Subparameters, AMI Reserved\_Parameters, and AMI functions Affected**

|  |  |  |
| --- | --- | --- |
| **Specification Item** | **New/Modified/Other** | **Notes** |
| Section 3, Item 2 as noted below on page 9. | Modified | Item 1 is unchanged but shown for case insensitivity reference |

**PROPOSED CHANGES:**

Change:

1. The content of the files is case sensitive, except for reserved words and keywords.
2. The following words are reserved words and must not be used for any other purposes in the document:

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

NA - used where data not available,

CIRCUITCALL - used for circuit call references in Section 6.3

to:

1. The content of the files is case sensitive, except for reserved words and keywords.
2. The following words are reserved words for the purposes described below or where their usage is documented elsewhere:

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

NA - used where data not available,

CIRCUITCALL - used for circuit call references in Section 6.3

* These words can be used elsewhere in a case-sensitive manner when they comply with other rules. For example, these words can be used as pin\_names (except for CIRCUITCALL, which exceeds the maximum number of characters allowed under pin\_name) and signal\_names under the [Pin] keyword (described later in Section 5):

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

Item 1 is also shown because it describes the case-insensity rule for reserved words.

Several revisions or additions to 2 were suggested:

Walter Katz suggested in BUSLabelBIRD\_1.docx, July 12, 2016:

1. The following words are reserved words and must not be used for any other purposes in the document:

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

NA - used where data not available,

CIRCUITCALL - used for circuit call references in Section 6.3

Note that these reserved name rules do not apply to pin names and signal names in the [Pin] section and node names in figures showing the interconnections between Devices Under Test (DUT) and the Test Fixture.

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The added statement is still too restrictive because other exceptions exist. Also, it does not reinforce the case-sensitivity aspect of the first rule. Also, circuitcall would violate the 5 character limit if it were to be used as a pin name.

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Bob Ross suggested (6/2/24 in the Editorial reflector):

1. The following words are reserved words for the purposes described below or where their usage is documented elsewhere.  However, these words can be used for other non-conflicting purposes in a case-sensitive manner:

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 or symbolic entries

NA                        - used where data not available,

CIRCUITCALL      - used for circuit call references in Section 6.3

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* While not mentioned, the [Pin List] nodes used "reserved words" GND, POWER, and NC as the first part of signal\_names. The ways that case-insensitive "reserved words" can be used are too numerous to list, but include pin\_name, signal\_name, bus\_label entries, and other column entries. They also include pathological cases for name. The key consideration is where case insensitivity stated in 1 does not apply.

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Mike LaBonte mentioned and suggested on 6/24/16:

Regarding reserved words, we probably should try to be clear that these are being called out because they reside in places where a value might be one of these words or an arbitrary string, the name of something. So for example “POWER” is theoretically only reserved when used as a model name

However, IBISCHK throws E1916 when I try to name a [Component] using any of the reserved words. This is not a surprise, it is common practice to have a single means for parsing all names and if reserved words are declared, they probably will be checked in that one place. I haven’t checked every type of named item in IBIS, but I have verified that an [External Circuit] paramfile can be named “POWER”, for example.

Maybe we should assume none of the reserved words can be used as the arbitrary name of anything, and enumerate them all. So the reserved words cannot be used as the name of a [Component], [Model], [Submodel], [Model Selector], [Define Package Model], [External Circuit], [Circuit Call], [Test Data], or [Test Load].

IBISCHK does allow the reserved words to be used for pin names, and I’m not sure how to treat that. If we find that the spec disallows it then it is an IBISCHK bug. Otherwise I’m almost tempted to disallow reserved words as pin names, but then we risk invalidating existing IBIS files. So we probably should specifically say it is allowed.

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The proposed revision is compromise verbiage to update the general Specification rule without getting into extreme detail.

**ANY OTHER BACKGROUND INFORMATION:**

Walter Katz proposed the language in the ATM Task Group in the BUSLabelBIRD\_1.docx, July 12, 2016 (it may have been proposed elsewhere or earlier). Bob Ross provided alternative wording.

This proposal was discussed at the September 13, 2016 ATM meeting, and it is noted that the "reserved parameter" rules for names under [Pin List] might be considered in the future.

BIRD185.1 just changed the indentation to the left for the paragraph starting with "These words" so that the paragraph aligns with "The following words"