**BUFFER ISSUE RESOLUTION DOCUMENT (BIRD)**

**BIRD NUMBER: 195**

**ISSUE TITLE:** Enabling [Rgnd] and [Rpower] Keywords for Algorithmic

Input Models

**REQUESTOR:**  Michael Mirmak, Intel Corp.

**DATE SUBMITTED:** June 19, 2018

**DATE REVISED:**

**DATE ACCEPTED:**

**DEFINITION OF THE ISSUE:**

The Terminator Model\_type keywords [Rpower], and [Rgnd] would be highly convenient for describing the analog electrical behavior of receivers for Algorithmic Models using simple circuits. However, the IBIS 6.1 specification specifically prohibits the use of Model\_type Terminator with the [Algorithmic Model] keyword, and the [Rpower] and [Rgnd] keywords are not available for any Model\_type other than Terminator. This BIRD enables the [Rpower] and [Rgnd] keywords under the Input Model\_type, to ease creation of simple input models for Algorithmic Modeling purposes.

**SOLUTION REQUIREMENTS:**

The IBIS specification must meet these requirements:

Table 1: Solution Requirements

|  |  |
| --- | --- |
| Requirement | Notes |
| 1. Permit the [Rpower] and [Rgnd] keywords to be used under the Input Model\_type.
 |  |
| 1. Make any clarifications needed for unambiguous parsing.
 |  |

**SUMMARY OF PROPOSED CHANGES:**

For review purposes, the proposed changes are summarized as follows:

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

|  |  |  |
| --- | --- | --- |
| Specification Item | New/Modified/Other | Notes |
| Restriction on [Rgnd] and [Rpower] being used only with Model\_type Terminator.  | Modified | [Rgnd] and [Rpower] may be used with Model\_type Input as well. |
| Rules for [Rac] and [Cac] usage | Modified | Clarified that [Rac] and [Cac] are only to be used together and cannot be used independently of each other. |
| Rules for C\_comp and [Rac], [Cac], [Rgnd] and [Rpower] | Modified | Clarified that the C\_comp and C\_comp\_\* subparameters are supported with these keywords, and that C\_comp is still required for [Model] |

**PROPOSED CHANGES:**

All page numbers refer to the Adobe\* PDF version of the document.

1. In IBIS version 6.1, change the [Model] keyword “Other Notes” section on p. 34 from:

*Other Notes:* A complete [Model] description normally contains the following keywords:
[Voltage Range], [Pullup], [Pulldown], [GND Clamp], [POWER Clamp], and [Ramp]. A
Terminator model may use the [Rgnd], [Rpower], [Rac], and [Cac] keywords. However, some
models may have only a subset of these keywords. For example, an input structure normally only
needs the [Voltage Range], [GND Clamp], and possibly the [POWER Clamp] keywords. If any of
[Rgnd], [Rpower], [Rac], and [Cac] keywords is used, then the Model\_type must be Terminator.

… to …

*Other Notes:* A complete [Model] description normally contains the following keywords:
[Voltage Range], [Pullup], [Pulldown], [GND Clamp], [POWER Clamp], and [Ramp]. A
Terminator model may use the [Rgnd] and/or [Rpower] keywords, as well as the [Rac] and [Cac] keyword pair. The [Rgnd] and [Rpower] keywords may appear in [Model] descriptions using other Model\_types. However, some models may have only a subset of these keywords. For example, an input structure normally only needs the [Voltage Range], [GND Clamp], and possibly the [POWER Clamp] keywords. If the [Rac] and [Cac] keyword pair is used, then the Model\_type must be Terminator.

1. In IBIS version 6.1, change the [Rgnd],[Rpower],[Rac],[Cac] keyword “Other Notes” section on p. 61 from:

*Other Notes:* [Rpower] is connected to “Vcc” and [Rgnd] is connected to “GND”. However,
[GND Clamp Reference] voltages, if defined, apply to [Rgnd]. [POWER Clamp Reference]
voltages, if defined, apply to [Rpower]. Either or both [Rgnd] and [Rpower] may be defined and
may coexist with [GND Clamp] and [POWER Clamp] tables. If the terminator consists of a series
R and C (often referred to as either an AC or RC terminator), then both [Rac] and [Cac] are
required. When [Rgnd], [Rpower], or [Rac] and [Cac] are specified, the Model\_type must be
Terminator.

… to…

*Other Notes:* [Rpower] is connected to “Vcc” and [Rgnd] is connected to “GND”. However,
[GND Clamp Reference] voltages, if defined, apply to [Rgnd]. [POWER Clamp Reference]
voltages, if defined, apply to [Rpower]. Either or both [Rgnd] and [Rpower] may be defined and
may coexist with [GND Clamp] and [POWER Clamp] tables. If the terminator consists of a series
R and C (often referred to as either an AC or RC terminator), then both [Rac] and [Cac] are
required; these two keywords shall only be used together for any given [Model]. When [Rac] and [Cac] are specified, the Model\_type shall be Terminator. [Rgnd] and [Rpower] may be used with Model\_type Terminator or with Model\_type Input. The C\_comp subparameter is required for [Model]s using any or all of these keywords; the C\_comp\_\* subparameters may be used in the same [Model] with any or all of these keywords.

**BACKGROUND INFORMATION/HISTORY:**

This was the topic of discussions in several IBIS-ATM Task Group meetings during May and June 2018. The ATM Task Group voted June 19, 2018 to recommend submission of the BIRD to the IBIS Open Forum.