

BIRD ID#:
ISSUE TITLE: IBIS-AMI Typographical Corrections
REQUESTER: Arpad Muranyi, Mentor Graphics, Inc.
DATE SUBMITTED:
DATE REVISED:
DATE ACCEPTED BY IBIS OPEN FORUM:

STATEMENT OF THE ISSUE:

Section 6c of the IBIS v5.0 specification has numerous typographical or editorial issues which may imply incorrect rules or could be confusing to the reader.

In Section 6c, "ALGORITHMIC MODELING INTERFACE (AMI)", the use of the keyword Format in parameter declarations is inconsistent with the common use of parameter tree structures. Since the Format keyword really doesn't serve a practical purpose and the existing IBIS AMI Check program does not issue an error or warning when Format is not included, the suggestion is to make the use of the keyword Format optional.

STATEMENT OF THE RESOLVED SPECIFICATIONS:

On pg. 140 replace the following lines:

```
| Usage: (required for model specific parameters)
|   In   Parameter is required Input to executable
|   Out  Parameter is Output only from executable
|   Info Information for user or EDA platform
|   InOut Required Input to executable. Executable may return different
|         value.
```

with these lines:

```
|* Usage <usage>:
|*
|* Required, where <usage> must be substituted by one of the following:
|   In   Parameter is required Input to executable
|   Out  Parameter is Output only from executable
|   Info Information for user or EDA platform
|   InOut Required Input to executable. Executable may return different
|         value.
```

On pg. 140 replace the following lines:

```
| Type: (default is Float)
|   Float
|   Integer
|   String
|   Boolean (True/False)
|   Tap (For use by TX and RX equalizers)
|   UI (Unit Interval, 1 UI is the inverse of the data rate frequency,
|       for example 1 UI of a channel operating at 10 Gb/s is 100 ps)
```

with these lines:

```
|* Type <data type>:  
|*  
|* Required, where <data type> must be substituted by one of the following:  
|   Float  
|   Integer  
|   String  
|   Boolean (True/False)  
|   Tap (For use by TX and RX equalizers)  
|   UI (Unit Interval, 1 UI is the inverse of the data rate frequency,  
|       for example 1 UI of a channel operating at 10 Gb/s is 100 ps)
```

On pg. 140 replace the following lines:

```
|   Format: (default is range)  
|   Value   <value> Single value data  
|   Range   <typ value> <min value> <max value>  
|   List    <typ value> <value> <value> <value> ... <value>
```

with these lines:

```
|* Format <data format> <data>:  
|*  
|* Where Format is optional (being deprecated) but <data format> and <data>  
|* are required. <data format> and <data> must be substituted with one of  
|* the following:  
|   Value   <value> Single value data  
|   Range   <typ value> <min value> <max value>  
|   List    <typ value> <value> <value> <value> ... <value>
```

On pg. 140 replace the following line:

```
|   Value   <value> Single value data
```

with these lines:

```
|*   Value   <value> Single value data. Note that Value and Default  
|*   are mutually exclusive, and must not be used together for  
|*   the same parameter.
```

On pg. 141 replace the following lines:

```
|           (Rx_Clock_PDF  
|           (Usage Info)  
|           (Type Float)  
|           (Format Table  
|           (Labels Row_No Time_UI Density)  
|           (-50 -0.1 1e-35)
```

with these lines:

```
|           (Rx_Clock_PDF  
|           (Usage Info)  
|           (Type Float)  
|*          (Table  
|*          (Labels "Row_No" "Time_UI" "Density")  
|           (-50 -0.1 1e-35)  
|
```

On pg. 141 reduce the indentation of the following lines:

```
|           Gaussian <mean> <sigma>
|           Dual-Dirac <mean> <mean> <sigma>
|           Composite of two Gaussian
|           DjRj <minDj> <maxDj> <sigma>
|           Convolve Gaussian (sigma) with uniform Modulation PDF
```

On pg. 141 replace the following lines:

```
|   Default <value>:
|     Depending on the Type, <value> will provide a default value for the
|     parameter. For example, if the Type is Boolean, <value> could be True
|     or False, if the Type is Integer, the <value> can be an integer value.
```

with these lines:

```
|   Default <value>:
|*   Default and Value are mutually exclusive, and must not be used together
|*   for the same parameter. Default is not allowed for Table, Gaussian,
|*   Dual-Dirac and DjRj. Default is optional for Range, List, Corner,
|*   Increment and Steps. If a Default <value> is specified it's value must
|*   have the same Type as the parameter. For example, if Type is Boolean,
|*   <value> must be either True or False, if Type is Integer, <value> must
|*   be an integer. If Default is specified, <value> must be a member
|*   of the set of allowed values of the parameter. The following table
|*   describes the default values of parameters when Default is not
|*   specified.
|*
|*       Range:      <typ>
|*       List:       <typ>
|*       Corner:    <typ>
|*       Increment: <typ>
|*       Steps:     <typ>
|*
```

On pg. 141 replace the following lines:

```
|   Description <string>:
|     ASCII string following Description describes a reserved parameter,
```

with these lines:

```
|   Description <string>:
|*   Optional. ASCII string following Description describes a reserved parameter,
```

On pg. 141 delete this sentence:

```
|
|           String
|     literals begin and end with a double quote (") and no double quotes are
|     allowed inside the string literals.
```

The following modifications assume that the section about Use_Init_Output starting on pg. 144 will be removed as a consequence of the corrections and simplifications made to the reference flow (BIRD 120).

On pg. 143 replace the following lines:

```
|           The model parameter file must be organized in the parameter
|           tree format as discussed in section 3.1.2.6 of "NOTES ON
|           ALGORITHMIC MODELING INTERFACE AND PROGRAMMING GUIDE",
|           Section 10 of this document. The file must have 2 distinct
|           sections, or sub-trees, 'Reserved_Parameters' section and
|           'Model_Specific' section with sections beginning and ending
|           with parentheses. The complete tree format is described in
|           the section 3.1.2.6 of the Section 10 of this document.
```

with these lines:

```
|           The model parameter file must be organized in the parameter
|           tree format as discussed in section 3.1.2.6 of "NOTES ON
|           ALGORITHMIC MODELING INTERFACE AND PROGRAMMING GUIDE",
|*          Section 10 of this document. The file may contain two distinct
|*          sections or sub-trees named 'Reserved_Parameters' and
|*          'Model_Specific', beginning and ending
|           with parentheses. The complete tree format is described in
|*          section 3.1.2.6 of Section 10 of this document.
```

On pg. 144 replace the following lines:

```
|           The following reserved parameters are used by the EDA tool
|           and are required if the [Algorithmic Model] keyword is
|           present. The entries following the reserved parameters
|           points to its usage, type and default value. All reserved
|           parameters must be in the following format:
|
|           (parameter_name (Usage <usage>)(Type <data_type>)
|                               (Default <values>) (Description <string>))
```

with these lines:

```
|*          The following four reserved parameters are used by the EDA tool
|           and are required if the [Algorithmic Model] keyword is
|           present. The entries following the reserved parameters
|*          define their usage, type, value, and description. These four reserved
|*          parameters must be in one of the three following formats (order not
important):
|
|*          (parameter_name (Usage <usage>)
|*                               (Type <data_type>)
|*                               (Value <value>)
|*                               (Description <string>))
|*
|*          (parameter_name (Usage <usage>)
|*                               (Type <data_type>)
|*                               (Default <value>)
|*                               (Description <string>))
|*
|*          (parameter_name (Usage <usage>)
|*                               (Type <data_type>)
|*                               (Format Value <value>)
|*                               (Description <string>))
|*
|*          (parameter_name (Usage <usage>)
|*                               (Type <data_type>)
|*                               (Value <value>)
|*                               (Description <string>))
```

On pg. 145 replace the following lines:

```
|           Tx_Jitter and Tx_DCD
```

These reserved parameters only apply to Tx models. These parameters are optional; if the parameters are not specified, the values default to "no jitter specified in the model ("0" jitter). If specified, they must be in the following format:

```
(<parameter_name> (Usage <usage>)(Type <data_type>)
                    (Format <data format>) (Default <values>)
                    (Description <string>))
```

with these lines:

Tx_Jitter and Tx_DCD

These reserved parameters only apply to Tx models. These parameters are optional; if the parameters are not specified, the values default to "no jitter specified in the model ("0" jitter). If specified, they must be in one of the following two formats:

```
* (<parameter_name> (Usage <usage>)
*   (Type <data_type>)
*   (<data format> <data>)
*   (Default <value>)
*   (Description <string>))
*
* (<parameter_name> (Usage <usage>)
*   (Type <data_type>)
*   (Format <data format> <data>)
*   (Default <value>)
*   (Description <string>))
```

On pg. 146 replace the following lines:

```
(Tx_Jitter (Usage Info)(Type Float)
           (Format Gaussian <mean> <sigma>))

(Tx_Jitter (Usage Info)(Type Float)
           (Format Dual-Dirac <mean> <mean> <sigma>))

(Tx_Jitter (Usage Info)(Type Float)
           (Format DjRj <minDj> <maxDj> <sigma>))

(Tx_Jitter (Usage Info)(Type Float)
           (Format Table
            (Labels Row_No Time Probability)
            (-5 -5e-12 1e-10)
            (-4 -4e-12 3e-7)
            (-3 -3e-12 1e-4)
            (-2 -2e-12 1e-2)
            (-1 -1e-12 0.29)
            (0 0 0.4)
            (1 1e-12 0.29)
            (2 2e-12 1e-2)
            (3 3e-12 1e-4)
            (4 4e-12 3e-7)
            (5 5e-12 1e-10) ))
```

with these lines:

```
(Tx_Jitter (Usage Info)(Type Float)
```

```

|*          (Gaussian <mean> <sigma>))
|
|          (Tx_Jitter (Usage Info)(Type Float)
|*          (Dual-Dirac <mean> <mean> <sigma>))
|
|          (Tx_Jitter (Usage Info)(Type Float)
|*          (DjRj <minDj> <maxDj> <sigma>))
|
|          (Tx_Jitter (Usage Info)(Type Float)
|*          (Table
|*          (Labels "Row_No" "Time" "Probability")
|          (-5 -5e-12 1e-10)
|          (-4 -4e-12 3e-7)
|          (-3 -3e-12 1e-4)
|          (-2 -2e-12 1e-2)
|          (-1 -1e-12 0.29)
|          (0 0 0.4)
|          (1 1e-12 0.29)
|          (2 2e-12 1e-2)
|          (3 3e-12 1e-4)
|          (4 4e-12 3e-7)
|          (5 5e-12 1e-10) ))
|

```

On pg. 146 replace the following lines:

```

|          (Tx_DCD (Usage Info)(Type Float)
|          (Format Range <typ> <min> <max>))

```

with these lines:

```

|          (Tx_DCD (Usage Info)(Type Float)
|*          (Range <typ> <min> <max>))
|

```

On pg. 146 replace the following lines:

```

|          Rx_Clock_PDF and Rx_Receiver_Sensitivity
|
|          These reserved parameters only apply to Rx models.  These
|          parameters are optional; if the parameters are not specified,
|          the values default to "0".  If specified, they must be in the
|          following format:
|
|          (<parameter_name> (Usage <usage>)(Type <data_type>)
|          (Format <data format>) (Default <values>)
|          (Description <string>))

```

with these lines:

```

|          Rx_Clock_PDF and Rx_Receiver_Sensitivity
|
|          These reserved parameters only apply to Rx models.  These
|          parameters are optional; if the parameters are not specified,
|*          the values default to "0".  If specified, they must be in one
|*          of the two following formats:
|*
|*          (<parameter_name> (Usage <usage>)
|*          (Type <data_type>)
|*          (<data format> <data>)
|*          (Default <value>))

```

```

|*                               (Description <string>))
|*
|*      (<parameter_name> (Usage <usage>)
|*                          (Type <data_type>)
|*                          (Format <data format> <data>)
|*                          (Default <value>)
|*                          (Description <string>))

```

On pg. 147 replace the following lines:

```

|      (Rx_Clock_PDF (Usage Info)(Type Float)
|                    (Format Gaussian <mean> <sigma>))
|
|      (Rx_Clock_PDF (Usage Info)(Type Float)
|                    (Format Dual-Dirac <mean> <mean> <sigma>))
|
|      (Rx_Clock_PDF (Usage Info)(Type Float)
|                    (Format DjRj <minDj> <maxDj> <sigma>))
|
|      (Rx_Clock_PDF (Usage Info)(Type Float)
|                    (Format Table
|                      (Labels Row_No Time Probability)
|                      (-5 -5e-12 1e-10)
|                      (-4 -4e-12 3e-7)
|                      (-3 -3e-12 1e-4)
|                      (-2 -2e-12 1e-2)
|                      (-1 -1e-12 0.29)
|                      (0 0 0.4)
|                      (1 1e-12 0.29)
|                      (2 2e-12 1e-2)
|                      (3 3e-12 1e-4)
|                      (4 4e-12 3e-7)
|                      (5 5e-12 1e-10) ))

```

with these lines:

```

|      (Rx_Clock_PDF (Usage Info)(Type Float)
|*                    (Gaussian <mean> <sigma>))
|
|      (Rx_Clock_PDF (Usage Info)(Type Float)
|*                    (Dual-Dirac <mean> <mean> <sigma>))
|
|      (Rx_Clock_PDF (Usage Info)(Type Float)
|*                    (DjRj <minDj> <maxDj> <sigma>))
|
|      (Rx_Clock_PDF (Usage Info)(Type Float)
|*                    (Table
|*                      (Labels "Row_No" "Time" "Probability")
|                      (-5 -5e-12 1e-10)
|                      (-4 -4e-12 3e-7)
|                      (-3 -3e-12 1e-4)
|                      (-2 -2e-12 1e-2)
|                      (-1 -1e-12 0.29)
|                      (0 0 0.4)
|                      (1 1e-12 0.29)
|                      (2 2e-12 1e-2)
|                      (3 3e-12 1e-4)
|                      (4 4e-12 3e-7)
|                      (5 5e-12 1e-10) ))

```

On pg. 147 replace the following lines:

```

|           (Rx_Receiver_Sensitivity (Usage Info)(Type Float)
|                                           (Format Value <value>))
|
|           (Rx_Receiver_Sensitivity (Usage Info)(Type Float)
|                                           (Format Range <typ> <min> <max>))
|
|           (Rx_Receiver_Sensitivity (Usage Info)(Type Float)
|                                           (Format Corner <slow> <fast>))

```

with these lines:

```

|           (Rx_Receiver_Sensitivity (Usage Info)(Type Float)
|*                                           (Value <value>))
|
|           (Rx_Receiver_Sensitivity (Usage Info)(Type Float)
|*                                           (Range <typ> <min> <max>))
|
|           (Rx_Receiver_Sensitivity (Usage Info)(Type Float)
|*                                           (Corner <slow> <fast>))

```

On pg. 149 replace the following lines:

```

|           The user defined parameters must be in the following format:
|
|           (<parameter_name> (usage <usage>) (Type <data type>)
|                                           (Format <data format>) (Default <values>)
|                                           (Description <string>))
|

```

with these lines:

```

|*           The user defined parameters must be in one of the following
|*           two formats:
|*
|*           (<parameter_name> (Usage <usage>)
|*                               (Type <data_type>)
|*                               (<data format> <data>)
|*                               (Default <value>)
|*                               (Description <string>))
|*
|*           (<parameter_name> (Usage <usage>)
|*                               (Type <data_type>)
|*                               (Format <data format> <data>)
|*                               (Default <value>)
|*                               (Description <string>))
|*

```

On pg. 150 replace the following lines:

```

(Model_Specific                               | Required heading
(txttaps
  (-2 (Usage Inout)(Type Tap) (Format Range 0.1 -0.1 0.2)(Default 0.1)
      (Description "Second Precursor Tap"))
  (-1 (Usage Inout)(Type Tap) (Format Range 0.2 -0.4 0.4)(Default 0.2)
      (Description "First Precursor Tap"))
  (0 (Usage Inout)(Type Tap) (Format Range 1 -1 2)(Default 1)
     (Description "Main Tap"))
  (1 (Usage Inout)(Type Tap) (Format Range 0.2 -0.4 0.4)(Default2 0.2)
     (Description "First Post cursor Tap"))
  (2 (Usage Inout)(Type Tap) (Format Range 0.1 -0.1 0.2)(Default 0.1)
     (Description "Second Post cursor Tap"))
)                                           | End txttaps

```



```

    (tx_freq_offset (Format Range 1 0 150) (Type UI) (Default 0))
  )
) | End Model_Specific
) | End SampleAMI

```

with these lines:

```

(Model_Specific | Required heading
(txtaps
* (-2 (Usage Inout)(Type Tap) (Range 0.1 -0.1 0.2)(Default 0.1)
  (Description "Second Precursor Tap"))
* (-1 (Usage Inout)(Type Tap) (Range 0.2 -0.4 0.4)(Default 0.2)
  (Description "First Precursor Tap"))
* (0 (Usage Inout)(Type Tap) (Range 1 -1 2)(Default 1)
  (Description "Main Tap"))
* (1 (Usage Inout)(Type Tap) (Range 0.2 -0.4 0.4)(Default2 0.2)
  (Description "First Post cursor Tap"))
* (2 (Usage Inout)(Type Tap) (Range 0.1 -0.1 0.2)(Default 0.1)
  (Description "Second Post cursor Tap"))
) | End txtaps
* (tx_freq_offset (Range 1 0 150) (Type UI) (Default 0))
) | End Model_Specific
) | End SampleAMI

```

Also, make sure "data format" is spelled consistently as "Data Format"...

The syntax for a leaf is:

```

<leaf>: ( <parameter name> whitespace <value list> )
So in a Table which is written like this: (-50 -0.1 1e-35), -50 is
actually a parameter name, i.e. a string, not a value.

```

Fix Table 1 and 3
- NA in Table 1

Ambiguity about the relationship between "Format" and text strings???

ANALYSIS PATH/DATA THAT LED TO SPECIFICATION

Careful reading of the specification revealed that these items are misleading and/or redundant. The proposed changes take into account the removal of the Use_Init_Output Boolean in the proposed reference flow.

ANY OTHER BACKGROUND INFORMATION:
