	A	B	C	D	E
1	**IBISv5.0 AMI specification BIRD task list**				
2	**Description**	**Clarification or correction**	**New feature**	**BIRD file name**	**Date done**
3					
4	**Parser developer questions (and some more related ones)**				
5	**first token** - is it required to be the file name? **no, the first token in the file actually does not need to be checked for matching to the filename; while this may be added as a restriction later, this is a LISP-ism and so may actually be any string.**	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
6	**Model_Specific** - is it required or optional ("The file must have 2 distinct sections, or sub-trees")? **(provided to parser developer by Arpad) Per our discussion today in the ATM meeting and Ambrish's approval, please tell the parser developer, that the intent was to have an optional Model Specific section in the .ami file which means that there is no requirement to have 2 sections at all times in the .ami file. We will write a BIRD to make the necessary changes in the specification.**	5.1		Typos_Format_Value_Default_BIRD.txt (BIRD 127)	January 18, 2011
7	**case sensitivity** - are .AMI files case sensitive? **yes**	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
8	**line length limit** - is there a line length limit in .AMI files? **Only the Description string in the .AMI file was intended to have a 120 character limit *per line* (the Description string can span multiple lines). The rest of the .AMI file lines are effectively unlimited in length.**	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
9	**comment character** - define comment character for .AMI files in the AMI portion of the spec. - what is the comment character in .AMI files? **For .AMI files... only the | character is acceptable as a comment character, regardless of what the calling IBIS file uses.** - why is "//" used in an example? **That example is a C source code excerpt from the DLL**	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
10	**white space** - define what it is in .AMI files **spaces and tabs, including new lines in .AMI file anything is allowed No attempt needs to be made to be consistent with .IBS files.**	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
11	**string** - define what it is	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
12	**integer** - define what it is	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
13	**float** - define what it is	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
14	**scale factors** - clarify **no .AMI files do not permit scaling factors or suffixes such as p, n, etc. Scientific and floating point notation is permitted.**	5.1		Definitions_BIRD.txt (BIRD 114)	August 24, 2010
15	**Fix examples with string parameters to match the string definition.**	5.1		BIRD 114	September 8, 2010
16	**min/typ/max** - define possible values - is increment always positive? **yes** - does default have to obey min <= default <= max? **I would think yes Default must be a legal value according to Format. Solved in the"Typos" BIRD (BIRD 127). Sweep starts at typ, tool goes up closest to max, then goes down closest to min. Increment is therefore always a positive number.**	5.1		MinTypMax_BIRD.txt (BIRD 115)	September 21, 2010
17	**Init_Returns_Impulse** and **GetWave_Exists** True - inconsistent **(correct)** - is the parameter "Default" not allowed for it? **(provided to parser developer by Walter) There is no default for these two; they must be specified. The BIRD should be amended to say something like:** | **and are required if the [Algorithmic Model] keyword is** | **present. The entries following the reserved parameters** | **points to its usage, type and value. All reserved** | **parameters must be in the following format:** | | **(parameter_name (Usage <usage>) (Type <data_type>)** | **(Value <values>) (Description <string>))** **further down:** | **Reserved Parameter Required Value Info In Out InOut** | | **Init Returns Impulse Yes True/False X** | **GetWave Exists Yes True/False X** **Technically Init is always used, and is required to be called before GetWave. The output, or modified impulse response of Init may or may not be generated. If not generated, then it is academic to say that the EDA tool can "use" it.** **Arpad: This is all solved now, not exactly as suggested here, but based on the new discussions/suggestions. (BIRD 127 took care of this).**	5.1		Typos_Format_Value_Default_BIRD.txt (BIRD 127)	January 18, 2011

	A	B	C	D	E
1	**IBISv5.0 AMI specification BIRD task list**				
2	**Description**	**Clarification or correction**	**New feature**	**BIRD file name**	**Date done**
18	**"Format", "Value", "Default"** - define rules **1) For the first 5 Reserved Parameters (listed on p. 145 of the PDF and below), the following two rules are to be observed:** **- "Format" is illegal and is therefore prohibited** **- "Default" is required and must be present** **2) For all other Reserved Parameters and model-specific parameters,** **- "Format" is required and must be present** **- "Default" is optional and may or may not be present** **Recall that the first 5 Reserved Parameters covered by (1) above are:** **GetWave_Exists, Init_Returns_Impulse, Use_Init_Output, Max_Init_Aggressors and Ignore_Bits.** **This means that the text description on page 144 of the 5.0 specification is correct. Table 1 and Table 3 of Section 6c have certain ambiguities, as you have highlighted, which these two rules will correct. A future version of the specification will make this clearer and more explicit.** **Note that these two rules build in an ambiguity about the relationship between "Format" and text strings. We advise flagging a warning that these are not currently parsed or covered in the specification (your choice).** What is the ambiuty, and does it need to be corrected??? (See row 25)	5.1		Typos_Format_Value_Default_BIRD.txt (BIRD 127)	January 18, 2011
19	**Usage, Type, Format issues:** Wording on pg. 140 of the specification may imply that: - Usage is optional for Reserved Parameters - Type and Format are optional since defaults are defined for them **Based on the stated and agreed upon syntax rules, Usage and Type are always required. No defaults are needed.** **Currently, Format always requires an argument starting with a word from the list: Value, Range, List, Corner, Increment, Steps, Table, Gaussian, Dual-Dirac, DjRj. No default exists for Format. However, Walter is working on a BIRD to make Format optional and eventually deprecate it.**	5.1		Typos_Format_Value_Default_BIRD.txt (BIRD 127)	January 18, 2011
20	**Table** - is a space required after "Table"? The "Table" format is specifically named as a "branch", which must have white space separating its name, "Table", from its value. pg 186: | 2. Parameter name/value pairs are always enclosed in parentheses, with the | value separated from the name by white space. pg. 140: | Table The parameter name "Table" names a branch of the parameter | tree rather than a single leaf. One of the leaves of this | branch can be named "Labels" and, if provided, is to be | assigned a string value containing a list of column names.	5.1		**False alarm.** **The spec doesn't say that a branch must be separated from its value by a white space.**	**Do nothing.** **Sepember 10, 2010**

21	**According to the BNF, the Format = Table syntax is invalid.** In this example:
	(Format Table
	     (Labels Row_No Time Probability)
	     (-5 -5e-12 1e-10)
	     (-4 -4e-12 3e-7)
	)
	Instead of the Table keyword, a list is expected according to the spec.
	If the table syntax would be changed to the following, then it would be consistent with the spec.:
	(Format **(**Table
	        (Labels Row_No Time Probability)
	        (-5 -5e-12 1e-10)
	        (-4 -4e-12 3e-7)
	     )
	)
	BIRD 127 only fixed "Format". If Format is removed, this s not a problem, but if Format is there the problem still exists. We need to fix this.
	Resolved in BIRD 132 (in a different way).
		5.1		Typos_Format_Value_Default_BIRD.txt
				(BIRD 127, BIRD132)
					1/18/2011
					5/25/2011

22	**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. Need answer! According to BIRD 132, the first column of the table is "just data", it has no special meaning.	5.1		Table_BIRD_Bob.docx (BIRD132)	May 25, 2011

	A	B	C	D	E
1	**IBISv5.0 AMI specification BIRD task list**				
2	**Description**	**Clarification or correction**	**New feature**	**BIRD file name**	**Date done**
23	**Is NA in Table 1 (pg. 148) correct for Default of Init_Returns_Impulse and GetWaveExists?** **(Why do we have default for a required parameter which implies that it is not required)?** - it is required, so why NA? **Arpad: The table has to be corrected to reflect what is in the text.**	5.1		Table1_3_BIRD.txt (BIRD 138)	June 21, 2011
24	**Incorrect examples for:** (Init_Returns_Impulse (Usage Info) (Type Boolean)(Default True)) (GetWave_Exists (Usage Info) (Type Boolean) (Default True)) according to Table 3, the Format must be specified and must be of format type "Value". - Note that some of the rules build in an ambiguity about the relationship between "Format" and text strings. **Arpad: The examples are correct based on the rules in the text, the table has to be corrected to reflect what is in the text.**	5.1		Typos_Format_Value_ Default_BIRD.txt (BIRD 127)	January 18, 2011
25	**Define relationship between Type and Format (allowable possible combinations)** For example, if Type = Tap .. what are the allowable Formats ? Is it OK to use Corner Format with String type ? How is UI different from Float ? **According to Walter:** **Type Allowed Formats** **Boolean Value, List, Corner** **String Value, List, Corner** **Float Value, List, Corner, Range, Increment, Steps** **Integer Value, List, Corner, Range, Increment, Steps** **UI Value, List, Corner, Range, Increment, Steps** **Tap Value, List, Corner, Range, Increment, Steps** **UI specifically is used to describe the values of parameters that are in Seconds. If the Type is Float, then a value of 10e-12 would be interpreted at 10ps. If the Type is UI, and the bit_time was 100ps, then a value of .1 would be interpreted by the EDA tool (and the DLL) as 10ps.**	5.1		Type_Format_Table_BIRD.txt (BIRD 136)	June 14, 2011
26	What about Format Table, Gaussian, DjRj and Dual-Dirac? **(See row 46-47)**	row 46-47	row 46-47	row 46-47	row 46-47
27	**Description** - define rules, required/optional **... about a year ago we agreed to a rule that Description is required for Reserved_Parameters and optional for Model_Specific - based on picking out actual parts of Section 6c that supported the above rule. The Parser enforces this rule. I think making Description optional is the best way to go and a compromise. Otherwise we change compliant models. Bob (It is now optional according to BIRD 127).**	5.1		Typos_Format_Value_ Default_BIRD.txt (BIRD 127)	January 18, 2011
28					
29	**AMI flow related**				
30	Order of EDA tool convolution and first Tx GetWave call	5.1		AMI flow BIRD (BIRD 120)	October 5, 2010
31	add parameter: Init_Returns_Filter		5.1+		
32	process Rx pad waveform with Rx_GetWave		5.1+		
33	**impulse_matrix** - can AMI_Init only modify the first column? - how about modifying the IR of cross talk aggressors? **According to Walter:** **AMI_Init can only modify the first column** **AMI_Init may not modify the crosstalk (not first) columns** **- need to discuss in light of the flow**	5.1		Xtalk_BIRD.txt (BIRD 130)	April 12, 2011
34	**clock_times** - clarify various topics	5.1		clock_times_BIRD.txt (BIRD 112)	May 4, 2010
35	**impulse response** - define how it is generated - clarify what is its unit - what should be done in absence of an analog IBIS model? - if Thevenin (LTI) buffer is used, what should be the amplitude? - what tap coefficients should the analog model represent? **Driver without EQ, already in spec**	5.1			

	A	B	C	D	E
1	**IBISv5.0 AMI specification BIRD task list**				
2	**Description**	**Clarification or correction**	**New feature**	**BIRD file name**	**Date done**
36	**parameter string** (passed into the DLL) - are quotes and other special characters (tabs, CRLF, etc…) allowed? **answer ??? (BIRD 127 took care of this).** **A string is anything between two double quotes. Anything legal in IBIS except a double quote is allowed in that string.** - clarify rules on how it is extracted from an .AMI file **Leaving the Table aside, the rules in the BNF are quite clear. (According to Walter)** **- double quotes are not allowed except surrounding string variables** **- any ASCI character (except ") are allowed between " surrounding string varables** **- tabs, CRLF are treated as white space** **- BNF as described in BIRD 5.0 (Noting that (Reserved_Parameter and (Model_Specific branches are eliminated** **- each parameter is followed by one of the allowed values specified for that parameter.**	5.1		Typos_Format_Value_ Default_BIRD.txt (BIRD 127)	January 18, 2011
37	**AMI parameters in / out** - describe what the purpose of parameters out is **The purpose of parameters out is for the AMI_Init call, and the AMI_GetWave calls to return to the EDA tool the values of Usage Out and InOut parameters. The EDA tool is to either report these values to the user, or use these values as specified by IBIS if they are reserved parameters, or by the model maker if they are Model Specific parameters. (According to Walter) BIRD 127 does NOT address all of the issues!!!** - which function (Init or GetWave) are allowed to return such values? **(BIRD 137 took care of this).** - how would the EDA tool know how to deal with Model_Specific parameters?	5.1		Typos_Format_Value_ Default_BIRD.txt (BIRD 127) **Out_InOut_BIRD.docx (Arpad)**	January 18, 2011

38	**Usage related questions - clarify (Fangyi)**
	1. If a parameter is of Usage Info, shall it be included in the input parameter string to the Init call?
	2. If a parameter is of Usage Out, shall it be included in the input parameter string to the Init call?
	3. If a parameter is of Usage InOut, shall it be included in the input parameter string to the Init call?
	4. If a parameter is of Usage Info or Out, can its sub-parameter be of Usage In?
	
	Walter: According to pg. 140 "Clearly In and InOut are required to be in the input parameters string. Well-written EDA tool should not put Info and Out in the input parameter string. Well-written DLL's should ignore Info and Out parameters in the input parameter string, or any other parameter that is not specified in the AMI file that the EDA tool passes to it. Well-written DLLs should put all Out and InOut parameters in the output parameter string. Well-written EDA tools should ignore In and Info parameter and other unknown parameters in the output parameter string. Well-written EDA tools should expect that all InOut and Out parameters are in the output parameter string, but handle gracefully when these Out and InOut parameters are not returns in the output parameter string.
	
	Regarding question 4, your question is worded in a misleading way. "sub-parameter" is not defined in IBIS 5.0. I believe that the following explanation does represent the intent of question 4.
	
	The current specification is clear that various combinations of question 4 are problematic. Assuming that parameter can be In, InOut, Info, or Out, and its sub parameter can independently be In, InOut, Info, or Out, there are 16 possible combinations, and some of them would violate the following rule.
	
	| 2. Parameter name/value pairs are always enclosed in parentheses, with the
	| value separated from the name by white space.
	
	One problematic example:
	
	 (root
	        (Model_Specific
	          (Xyz (Usage In) (Type Integer) (Range 0 0 5) (Description "Xyz configuration")
	             (Abc (Usage In) (Type Integer) (Range 0 –10 10) ("Description Xyz Abc control"))
	          )
	        )
	)
	The following input parameter string would violate the 2. rule above: (root (Xyz 3 (Abc -5)))
		5.1		Typos_Format_Value_
				Default_BIRD.txt
				(BIRD 127)
					January 18, 2011

39	**Add: "It is only the leaves of a parameter tree that can have Usage defined for them"** Need page number… **(BIRD 127 took care of this).**	5.1		Typos_Format_Value_ Default_BIRD.txt (BIRD 127)	January 18, 2011
40	Change "parameter" to "AMI parameter" in: | A leaf is a **parameter** if the leaf only contains sub-parameters. | | A parameter tree contains a root, branches and leaves. A branch of the parameter tree is | an AMI Parameter, if it has one of the following leaves: Where is this in the spec? Need a page number... **(BIRD 127 took care of this).**	5.1		Typos_Format_Value_ Default_BIRD.txt (BIRD 127)	January 18, 2011
41	**Add a reserved parameter to the .ami file for version control**	5.1		Version_BIRD.txt (BIRD 126)	December 14, 2010
42					
43					
44	**List from existing BIRD draft (as of February 23, 2010)**				
45	remove branches: Reserved_Parameters, Model_Specific		5.1+		

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1	**IBISv5.0 AMI specification BIRD task list**				
2	**Description**	**Clarification or correction**	**New feature**	**BIRD file name**	**Date done**
46	remove reserved parameters: Tx_Jitter, Rx_Clock_PDF **(See BIRD 123)**	**???**			
47	remove keywords: Format, Gaussian, Table, DjRj, Dual-Dirac **(See BIRD 123)**	**???**			
48	add keyword: Array		5.1+		
49					
50	**New issues discovered**				
51	**AMI_parameters_out** - optional for AMI_GetWave only? - specify that if not returned the pointer should be a valid NULL pointer - do the same for AMI_parameters_in (NULL pointer) **For AMI_parameters_in: NULL pointer not allowed, empty string allowed,** **For AMI_parameters_out (both): NULL pointer and empty string allowed, or model may chose to not do anything**	5.1		AMI_ParametersOut _BIRD.txt (BIRD 137)	June 21, 2011
52	**What should the tool do without clock times?** - need to specify how the tool should sample the waveform - address other SERDES protocols which use external clocking		5.1+		
53	**Labels** BIRD draft from Walter?		5.1+		
54	**Format Corner and Range interpretation** - spell out what makes the selection for Corner and Range. Is it the tool's corner setting? **Yes** - if so, how does typ/min/max align with typ/slow/fast for Corner? **Need answer!** **Decided to leave it up to the EDA tool, since IBIS doesn't really define slow and fast.** - is it supposed to be shown in a GUI for the user to make a selection? **No, this should be done automatically**	5.1		AMI_CornerRange _BIRD.txt	
55	**Add Boolean to the BNF**	5.1		AMI_BooleanInBNF_BIRD.txt (BIRD 135)	June 14, 2011
56	**Should (Usage Out) parameters have Default or a Value at all?**	5.1			
57	**Existing Reserved_Parameters of (Usage Out) need definition for which function resturns them (Init or GetWave)**		5.1+		
58	**Model_Specific parameters should not be (Usage Out) or (Usage InOut)**		5.1+		
59	**Make sure Table 1 (pg. 148) doesn't show Ignore_Bits as Out**	5.1		Table1_3_BIRD.txt (BIRD 138)	June 21, 2011
60	**Clarify what kinds of failures should result in "0" in the function's return value (Section 3.1.3 and 3.3.3)** - function call failure - model cannot operate properly (CDR getting out of lock)	5.1		AMI_FunctionReturnValue_ BIRD.txt (BIRD 134)	May 31, 2011
61	**Are the **AMI_parameters_out arguments of AMI_Init and AMI_GetWave the same or different memory locations?** - if it is the same, this is inconsistent with **msg - if not the same, **msg should only be available to AMI_Init… **It is up to the EDA tool to decide pointer to the string pointer is the same for Init and GetWave** **It is up to the AMI model to decide whether the pointer to the string points to the same string for Init and GetWave or multiple calls of GetWave** ****msg should only be used by Init**			AMI_ParametersOut _BIRD.txt (BIRD 137)	June 21, 2011
62	**Clarify the **msg argument** - who allocates/deallocates its memory (DLL)? **Memory for the string is allocated by the AMI model in AMI_Init** - IF it is the DLL, it is allocated in AMI_Init. Will this be available to AMI_GetWave too? **Not to be used by GetWave**	5.1		AMI_ParametersOut _BIRD.txt (BIRD 137)	June 21, 2011
63	**Should AMI_Close always be required?** - should the spec say that all memory deallocations are done in AMI_Close? - is that possible? (What if AMI_Init or GetWave allocates memory that is not visible to AMI_close)? - Currently AMI_Close is not required with AMI_Init, therefore when AMI_Close is not present AMI_Init has to do memory deallocations also… - goal is to make the model maker's life easier, and this is kind of confusing...				
64					
65					

66	Scott's suggestion:
	1) clarification
	   - top level clarification BIRD -> full document, rewrite 5.0 with clarifications
	     - subset -> clarification sub-BIRD-s to clarify specific things (clock_time, flow, etc…)				

67	2) new stuff in separate BIRD-s (justification and proposed solutions)				
68					
69	Bob's suggestion: One BIRD that would be needed as a starting point is to correct/clarify Section 6c statements and examples according to these rules that were agreed upon for releasing the parser.				