IBIS Open Forum Minutes

Meeting Date: **June 3, 2022**
Meeting Location: **Teleconference**

VOTING MEMBERS AND 2022 PARTICIPANTS

AMD (Xilinx)	(Bassam Mansour)
Analog Devices (Maxim Integrated)	Tushar Pandey, Jermaine Lim, Rolynd Aquino, Aprille Hernandez-Loyola, Janchris Espinoza, Francis Ian Calubag, Toni Rose Racelis, Thi Nhu Quynh Nguyen
ANSYS	Curtis Clark*
Applied Simulation Technology	(Fred Balistreri)
Broadcom	(Yunong Gan), Jim Antonellis
Cadence Design Systems	Zhen Mu*, Jared James, Ken Willis
Celestica	(Sophia Feng)
Cisco Systems	(Stephen Scearce)
Dassault Systemes	(Stefan Paret), Longfei Bai
Google	(Hanfeng Wang)
Huawei Technologies	(Hang (Paul) Yan)
Infineon Technologies AG	(Christian Sporrer)
Instituto de Telecomunicações	(Abdelgader Abdalla)
Keysight Technologies	Radek Biernacki*, Ming Yan*, Fangyi Rao, Majid Ahadi Dolotsara, Pegah Alavi, Saish Sawant
Luminous Computing	(David Banas)
Marvell	Steven Parker*
MathWorks	Walter Katz*, [Mike LaBonte]
Micron Technology	Randy Wolff*, Aniello Viscardi, Justin Butterfield, Dragos Dimitriu
MST EMC Lab	(Chulsoon Hwang)
SerDesDesign.com	John Baprawski
Siemens EDA	Arpad Muranyi*, Weston Beal, Amin Maher, Scott Wedge, Steve Kaufer, Todd Westerhoff, Vladimir Dmitriev-Zdorov, Ken Cantrell
Synopsys	Ted Mido*
Teraspeed Labs	Bob Ross*
Waymo	Zhiping Yang*
ZTE Corporation	(Shunlin Zhu)
Zuken	(Michael Schäder)
Zuken USA	Lance Wang*

OTHER PARTICIPANTS IN 2022

Amazon Lab126	Ashkar Hashemi
Ampere Computing	Le Duy Quang
CEMWorks	Cielo Gerrie
Ciena	Hugues Tournier
Ericsson	(Guohua Wang)
IBM	Greg Edlund
Imperial College, UK	Cong Ling

Intel Corporation	Hsinho Wu*, Michael Mirmak, Jingbo Li, Liwei Zhao
Mercury Systems	Vincent Tam
National Central University, Taiwan	Chiu-Chih Chou, Liu Huang Fu, Bohong Chai, Remxiang Xu, Kuan Fa, Yanting Li
OVT	Sirius Tsang
SAE ITC	José Godoy
SerialLink Systems	Aleksey Tyshchenko, David Halupka
STMicroelectronics	(Olivier Bayet)
University of Colorado, Boulder, ECEE	Eric Bogatin
University of Illinois	José Schutt-Aine
Politecnico di Torino	Stefano Grivet Talocia, Tommaso Bradde, Marco De Stefano, Riccardo Trinchero, Alessandro Zanco, Antonio Carlucci
Unaffiliated	Mike LaBonte*

In the list above, attendees at the meeting are indicated by *. Those submitting an email ballot for their member organization for a scheduled vote are indicated by ^. Principal members or other active members who have not attended are in parentheses. Participants who no longer are in the organization are in square brackets.

UPCOMING MEETINGS
The connection information for future IBIS teleconferences is as follows:

Microsoft Teams meeting
Join on your computer or mobile app
Click here to join the meeting

Join with a video conferencing device
106010980@teams.bjn.vc
Video Conference ID: 114 666 897 5
Alternate VTC dialing instructions

Or call in (audio only)
+1 267-768-8015,554664847#   United States, Philadelphia
Phone Conference ID: 554 664 847#
Find a local number | Reset PIN
Learn More | Meeting options

All teleconference meetings are 8:00 a.m. to 9:55 a.m. US Pacific Time. Meeting agendas are typically distributed seven days before each Open Forum. Minutes are typically distributed within seven days of the corresponding meeting.

NOTE: "AR" = Action Required.

INTRODUCTIONS AND MEETING QUORUM

Mike LaBonte declared that a quorum had been reached.

CALL FOR PATENTS

Randy Wolff called for declaration of any patents or pending patents related to the IBIS, IBIS-ISS, ICM, or Touchstone 2.0 specifications. No patents were declared.

REVIEW OF MINUTES AND ARS

Randy Wolff called for comments on the minutes of the May 13, 2022, IBIS Open Forum teleconference. Curtis Clark moved to approve the minutes. Arpad Muranyi seconded the motion. There were no objections.

Randy Wolff called for comments on the minutes of the May 26, 2022, European Summit at SPI 2022. Bob Ross said Mike LaBonte should have been listed in square brackets in the participants list, denoting that they were previously associated with the companies, but no longer. Arpad Muranyi moved to approve the minutes with corrections as noted. Zhiping Yang seconded the motion. There were no objections.

Randy reviewed ARs from the previous meeting.

- Randy Wolff and Steve Parker to make web changes for new ISSIRD template document [AR]
  Randy said that was done.

- Michael Mirmak to add note to TSIRD 4 that no parser change is required [AR]
  Randy said Michael had not yet returned from sabbatical.

- Randy Wolff to contact SAE ITC about IEEE standardization [AR]
  Randy said the board was waiting for proposed meeting times from SAE ITC.

- Steven Parker to add TSIRD template to website [AR]
  Steven said this was done.

- Randy Wolff to announce BIRD template vote [AR]
  Randy said this was done.

- Randy Wolff to update BIRD181.1 to reflect rejection [AR]
  Randy said this was done.

- Bob Ross to update BUG232 classification [AR]
  Bob said this was done.

- Bob Ross to update BUG233 classification [AR]
  Bob said this was done.

ANNOUNCEMENTS, **CALL FOR ADDITIONAL AGENDA ITEMS**

None

MEMBERSHIP STATUS AND TREASURER'S REPORT

Bob Ross reported that June 1, 2022, was the cutoff date for voting privileges of as-yet unpaid prior year members. We had 26 renewed and new members. Ericsson, Intel, and STMicroelectronics had been moved to non-voting status after the end of May. The Cadence payment was pending and had been impacted by an error at SAE ITC, but they would keep their voting status. Ericsson may drop, that was unknown. The STMicroelectronics contact was unavailable. We had a new balance of $17,874 for 2022 payments, and a balance adjusted for

2022 attribution of $21,224. A balance of $450 was attributed to 2023. Voting status would be restored as soon as payment was received. Officer election votes could be cast, and they would be deemed valid if payment was received by June 15, 2022. Randy Wolff asked if the Ericsson logo should be dropped from the website. Bob said that seemed reasonable.

WEBSITE ADMINISTRATION

Randy showed the new IBIS-ISS page and the ISSIRD page. Bob Ross suggested adding navigation bar links for the new pages. Randy said we already had links in two places, he suggested not extending the navigation bar. Bob withdrew his request. Steven Parker reported that minutes were up to date, and the SPI summit had been rotated to the bottom. Randy said the SPI entry could be updated with known information, which he would send to Steve. Randy said we needed an HTML page for Touchstone, which currently had only a directory listing.

MAILING LIST ADMINISTRATION

Curtis Clark reported that we had some new email subscriptions from new companies. Randy Wolff said we needed to ensure that someone from each member company was subscribed to ibis@freelists.org, so that each member received vote notices. Curtis felt we had full coverage, but he would check. Bob said we needed an AMD logo to replace the Xilinx logo on the IBIS web pages. Curtis said some bounces had resulted from people using their new email addresses.

Curtis Clark to check that someone from each member company is subscribed to ibis@freelists.org [AR]

LIBRARY UPDATE

Zhiping Yang reported that there was no activity.

INTERNATIONAL/EXTERNAL ACTIVITIES

- Conferences

Randy Wolff said SPI could be dropped as a topic in this section.

The IEEE EMC+SIPI conference would be held in Spokane, Washington, August 1 to 5, 2022.

> IEEE International Symposium on Electromagnetic Compatibility, Signal & Power Integrity (EMC+SIPI), August 1-5, 2022
> https://emc2022.emcss.org

Zhiping Yang found the IEEE article about the experts panel that would focus on IBIS:

> Announcing the "Ask The Experts" Panels at the 2022 IEEE International Symposium on EMC+SIPI in Spokane, Washington
> https://ieeexplore.ieee.org/document/9780299

- Press Updates

Randy Wolff said Signal Integrity Journal had published the first part of an article by John Baprawski, covering IBIS models:

> Overcoming Signal Integrity Channel Modeling Issues
> https://www.signalintegrityjournal.com/articles/2509-overcoming-signal-integrity-channel-modeling-issues

Randy said Signal Integrity Journal had also published his article about IBIS 7.1:

IBIS 7.1 Delivers a Wealth of Improvements for Signal Integrity Engineers
https://www.signalintegrityjournal.com/articles/2611-ibis-71-delivers-a-wealth-of-improvements-for-signal-integrity-engineers

Randy said he was not aware if the IEEE quarterly with his article about IBIS 7.1 had been published yet. Zhiping Yang said he would check on that, and he found:

What's New with IBIS and Upcoming Opportunities for SI and PI Engineers to Learn More
https://ieeexplore.ieee.org/document/9780308

- Related standards

IEC 63055/IEEE 2401, JEITA "LPB"

No update.

- IEEE IBIS Standardization

Randy said we needed to have a meeting with SAE ITC before pursuing an IEEE IBIS standard. Zhiping asked if we had any questions for IEEE. Randy said that would have to wait until after the SAE ITC meeting.

SUMMIT PLANNING AND REVIEW

- European Virtual IBIS Summit with SPI

Randy Wolff said the IEEE SPI summit had been held Thursday, May 26, 2022. We had 35 participants, for the full 4 hours. He felt it went well. Mike LaBonte said it was good to see interaction between the universities. Bob Ross said he would update the index links for the listing of all summit presentations. He felt there should be heading lines for each summit in the May 13, 2022, Open Forum minutes.

- Hybrid IBIS Summit with IEEE EMC+SIPI

Randy said the IEEE EMC+SIPI summit would be August 5, 2022. He would start sending announcements. He said it would be hybrid, hoping the audio would work well. There would be breakfast, but no lunch would be provided. Zhiping Yang said IEEE would handle catering. Bob said we could credit IEEE EMC Society in the summit backdrop, with permission to use their logo. We already had permission to use the event banner. Permission would be needed in time for the first summit announcement email.

Zhiping Yang to get permission to use IEEE EMC Society branding on our backdrop [AR]

Randy Wolff to start sending announcements for IEEE EMC+SIPI summit [AR]

QUALITY TASK GROUP

Mike LaBonte said the group meets on Tuesdays at 9:00 a.m. PT. Bob Ross would chair future meetings and Weston Beal would take minutes. Radek Biernacki asked about updates to the Quality Task Group web page, which listed Mike as chair. Mike suggested Bob could decide the updates to be made.

The Quality task group checklist and other documentation can be found at:

http://www.ibis.org/quality_wip/

ADVANCED TECHNOLOGY MODELING TASK GROUP

Arpad Muranyi reported that the group meets on Tuesdays at 12:00 a.m. PT. They had finalized the PAMn BIRD, to be discussed today. New discussions about power integrity would take place the following Tuesday, with Kinger Cai joining. Arpad had also been considering new ideas for IBIS I-V models, that others seemed interested in. Arpad invited anyone with new topics to join. Zhiping Yang said he would send information to Arpad about the power integrity topic.

Task group material can be found at:

>   http://www.ibis.org/macromodel_wip/

INTERCONNECT TASK GROUP

Randy Wolff said he was chairing in the absence of Michael Mirmak. There were many ideas about Touchstone 3.0, including pole-residue format, and many decisions to make. He encouraged those interested to join the group. Arpad Muranyi said port naming was another major topic.

Task group material can be found at:

>   http://www.ibis.org/interconnect_wip/

EDITORIAL TASK GROUP

Randy Wolff reported that the group remained suspended, but the group might resume in a month or so. Arpad Muranyi said we should be almost ready to make a list of BIRDs for inclusion in IBIS 7.2. Randy said he had a presentation to show on that topic, later in the meeting.

Task group material can be found at:

>   http://www.ibis.org/editorial_wip/

NEW ADMINISTRATIVE ISSUES

- New BIRD template

Randy showed the proposed BIRD template. Bob Ross moved to vote by acclamation. Radek Biernacki seconded. There were no objections. Randy called for objections to using the new template. There were no objections.

Randy Wolff to send new BIRD template to Steven Parker for posting [AR]

- Officer elections

Mike LaBonte said nominations had closed at the end of May 31, 2022, and the ballot email had been sent the following day. Each office had one candidate on the ballot:

Chair	Randy Wolff, Micron Technology
Vice-Chair	Lance Wang, Zuken USA
Treasurer	Bob Ross, Teraspeed Labs
Secretary	Graham Kus, MathWorks
Webmaster	Steve Parker, Marvell
Librarian	Zhiping Yang, Waymo
Postmaster	Curtis Clark, ANSYS

The voting period had begun on June 1, 2022 and would continue through June 15, 2022. Votes could be received by email from members in good standing. Each member company could send one vote for each office. Bob Ross would be informing Mike of the voting status of each member. The results would be announced by email on June 16, 2022, and in the next Open Forum meeting. Arpad Muranyi asked where he could find the candidate list. Mike said it had been sent to the official email list on June 1, but he would forward it to Arpad. Randy said a reminder email would usually be sent in the middle of the voting period.

- New IBIS roles

Randy proposed to create additional officer roles, including a University Relations Chair. He showed a list of responsibilities for the role:

1. Network with universities to increase academic memberships in IBIS.
2. Solicit presentations on behavioral modeling topics for IBIS task groups and Summit meetings.
3. Encourage student attendance in IBIS task group and Summit meetings; includes distribution of IBIS meeting invitations to university members.
4. Research feasibility of student projects such as software development of IBIS parser code. (NCSU students used to maintain S2IBIS code, for example. We will be looking for software development of a Touchstone 3.0 parser within the next year.)
5. Collaborate with industry and academia on IBIS related research and publications.

Randy said changes would not be needed in the IBIS Policies and Procedures to accommodate the position. However, some IBIS Board changes Randy would like to make would require changes to the P&P. Randy hoped to foster increased involvement in IBIS. Zhiping Yang liked the idea, believing several professors and students might be interested.

NEW AND REVISED *IRDS:

None

*IRDS SCHEDULED FOR VOTE:

None

*IRDS ELIGIBLE FOR VOTE:

BIRD213: EXTENDING IBIS-AMI FOR PAMn ANALYSIS

Randy Wolff showed the BIRD. Arpad Muranyi said the new changes made the new keywords co-exist well with the older PAM4 keywords. The main point was to extend IBIS-AMI to any number of signal levels. Walter Katz added that it clarified how PAM_Offsets interacted. That new AMI parameter was handled differently from PAM4_Offset. Randy said we had started nearly a year ago. Arpad said the original idea was to work with existing keywords for encoding, but it got too complicated and was too prescriptive of what EDA tools should do. Randy said the updated BIRD had a vote of recommendation from the ATM Task Group. Curtis Clark said strings with multiple values were used instead of tables. Arpad said that had been found to be simpler. Curtis said it made forming the model return easier for DLLs.

BIRD219.1: AMI PARAMETER ROOT NAME CLARIFICATION

Randy Wolff showed the BIRD, noting it had been introduced in the previous meeting. Arpad Muranyi moved to schedule a vote in the next meeting. Mike LaBonte asked when author Michael Mirmak would be rejoining meetings. Randy said Michael had said it would be OK to pass the BIRD in his absence. Arpad said we would need him to answer any questions. Lance Wang suggested waiting to vote. Arpad withdrew his motion.

TABLED *IRDS (NO DISCUSSION WITHOUT MOTION TO "UNTABLE"):

TSIRD4: [END] KEYWORD CORRECTIONS AND OTHER EDITORIAL CHANGES

No discussion.

IBISCHK AND TSCHK PARSER AND BUG STATUS

Bob Ross said there were no new parser bugs to discuss. There was a BUG227 related to BIRD219.1, that was waiting for BIRD approval. Bob said Mike LaBonte might have created a testcase. Mike said he had. Randy Wolff said BUG227 would not be fixed until the BIRD was passed. Bob said a development specification was still needed to cover the work to be done. He said there also would be a new BUG234, yet to be written. Randy said there would be an IBISCHK 7.1.1 to give a clean version on which IBISCHK 7.2.0 would be based when IBIS 7.2 was passed.

NEW TECHNICAL ISSUES

Randy Wolff showed a presentation "IBIS 7.2 BIRD Content". Four BIRDs had been approved since IBIS 7.1, and two were in progress. Randy showed a table estimating the level effort to update EDA tools and IBISCHK for each BIRD. Randy said the Editorial Task Group would address a long list of IBIS 7.1 known issues as well. The remaining BIRDs might be approved on July 15, 2022. IBIS 7.2 might be ratified in late Q4 of 2022. Arpad Muranyi suggested holding the IBIS 7.2 BIRD list vote on the same day the final BIRDs are voted. Randy said he could plan for that.

Arpad asked about the "large" estimated effort for BIRD219.1 IBISCHK changes, while BIRD217 required no change. He said that since checking root names requires the parser to execute the AMI DLL, it could also check for whether the model returns clock times. Randy noted that the planned check for root names involved calling only AMI_Init, not AMI_GetWave. Mike LaBonte added that checking for clock times involved calling AMI_GetWave repeatedly until Ignore_Bits was reached if no clock times were seen. Arpad commented that it is not enough to check root names with the Init function only because the root name may also be returned by the AMI_GetWave function, and that should also be checked. Randy suggested going one step at a time. Regarding clock times checking, Mike suggested that when clock times were not seen, IBISCHK would print an error if Rx_Decision_Time was present and a warning if not. Arpad agreed.

NEXT MEETING

The next IBIS Open Forum teleconference meeting would be held on June 24, 2022. Randy Wolff said he would be unavailable on that day, and Lance Wang would chair. The following IBIS Open Forum teleconference meeting was tentatively scheduled for July 15, 2022.

Radek Biernacki said he had enjoyed many years of working with the IBIS Open Forum, also wishing Mike LaBonte well on his retirement. Arpad thanked Radek for his service. Several people joined in with thanks and well wishes for Radek and Mike.

Radek Biernacki moved to adjourn. Mike LaBonte seconded the motion. The meeting adjourned.

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NOTES

IBIS CHAIR: Randy Wolff (208) 363-1764
  rrwolff@micron.com
  Principal Engineer, Silicon SI Group, Micron Technology, Inc.
  8000 S. Federal Way
  P.O. Box 6, Mail Stop: 01-720
  Boise, ID 83707-0006

VICE CHAIR: Lance Wang (978) 633-3388
  lance.wang@ibis.org
  Solutions Architect, Zuken USA
  238 Littleton Road, Suite 100
  Westford, MA 01886

SECRETARY: Mike LaBonte
  mike.labonte@ibis.org

TREASURER: Bob Ross (503) 246-8048
  bob@teraspeedlabs.com
  Engineer, Teraspeed Labs
  10238 SW Lancaster Road
  Portland, OR 97219

LIBRARIAN: Zhiping Yang (650) 214-0868
  zhipingyang@google.com
  Sr. Hardware Manager, Google LLC
  1600 Amphitheatre Parkway
  Mountain View, CA 94043

WEBMASTER: Steven Parker (845) 372-3294
  sparker@marvell.com
  Senior Staff Engineer, DSP, Marvell
  2070 Route 52
  Hopewell Junction, NY 12533-3507

POSTMASTER: Curtis Clark
  curtis.clark@ansys.com
  ANSYS, Inc.
  150 Baker Ave Ext
  Concord, MA 01742

This meeting was conducted in accordance with SAE ITC guidelines.

All inquiries may be sent to info@ibis.org. Examples of inquiries are:

- To obtain general information about IBIS.
- To ask specific questions for individual response.

- To subscribe to or unsubscribe from the official ibis@freelists.org and/or ibis-users@freelists.org email lists (formerly ibis@eda.org and ibis-users@eda.org):
  - https://www.freelists.org/list/ibis
  - https://www.freelists.org/list/ibis-users
- To subscribe to or unsubscribe from one of the task group email lists: ibis-macro@freelists.org, ibis-interconn@freelists.org, ibis-editorial@freelists.org, or ibis-quality@freelists.org:
  - https://www.freelists.org/list/ibis-macro
  - https://www.freelists.org/list/ibis-interconn
  - https://www.freelists.org/list/ibis-editorial
  - https://www.freelists.org/list/ibis-quality
- To inquire about joining the IBIS Open Forum as a voting Member.
- To purchase a license for the IBIS parser source code.
- To report bugs or request enhancements to the free software tools: ibischk6, tschk2, icmchk1, s2ibis, s2ibis2 and s2iplt.

The BUG Report Form for ibischk resides along with reported BUGs at:

http://www.ibis.org/bugs/ibischk/
http://www.ibis.org/ bugs/ibischk/bugform.txt

The BUG Report Form for tschk2 resides along with reported BUGs at:

http://www.ibis.org/bugs/tschk/
http://www.ibis.org/bugs/tschk/bugform.txt

The BUG Report Form for icmchk resides along with reported BUGs at:

http://www.ibis.org/bugs/icmchk/
http://www.ibis.org/bugs/icmchk/icm_bugform.txt

To report s2ibis, s2ibis2 and s2iplt bugs, use the Bug Report Forms which reside at:

http://www.ibis.org/bugs/s2ibis/bugs2i.txt
http://www.ibis.org/bugs/s2ibis2/bugs2i2.txt
http://www.ibis.org/bugs/s2iplt/bugsplt.txt

Information on IBIS technical contents, IBIS participants and actual IBIS models are available on the IBIS Home page:

http://www.ibis.org/

Check the IBIS file directory on ibis.org for more information on previous discussions and results:

http://www.ibis.org/directory.html

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SAE STANDARDS BALLOT VOTING STATUS

Organization	Interest Category	Standards Ballot Voting Status	April 22, 2022	May 13, 2022	May 26, 2022	June 3, 2022
AMD (Xilinx)	Producer	Inactive	-	-	-	-
Analog Devices (Maxim Integrated)	Producer	Inactive	-	-	X	-
ANSYS	User	Active	X	X	-	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	X	-
Cadence Design Systems	User	Active	X	X	-	X
Celestica	User	Inactive	-	-	-	-
Cisco Systems	User	Inactive	-	-	-	-
Dassault Systemes	User	Inactive	-	-	X	-
Google	User	Inactive	-	-	-	-
Huawei Technologies	Producer	Inactive	-	-	-	-
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Instituto de Telecomunicações	User	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	-	*
Keysight Technologies	User	Active	X	X	-	X
Luminous Computing	General Interest	Inactive	-	-	-	-
Marvell	Producer	Active	X	X	-	X
MathWorks	User	Active	X	X	-	X
Micron Technology	Producer	Active	X	X	X	X
MST EMC Lab	User	Inactive	-	-	-	-
SerDesDesign.com	User	Inactive	-	-	-	-
Siemens EDA (Mentor)	User	Active	X	X	X	X
STMicroelectronics	Producer	Inactive	-	-	-	-
Synopsys	User	Active	X	X	-	X
Teraspeed Labs	General Interest	Active	X	X	X	X
Waymo	User	Active	X	X	-	X
ZTE Corp.	User	Inactive	-	-	-	-
Zuken	User	Active	X	X	X	X

* = Temporarily not a voting member

Criteria for SAE member in good standing:
- Must attend two consecutive meetings to establish voting membership
- Membership dues current
- Must not miss two consecutive meetings (voting by email counts as attendance)

Interest categories associated with SAE standards ballot voting are:
- Users - members that utilize electronic equipment to provide services to an end user.
- Producers - members that supply electronic equipment.
- General Interest - members are neither producers nor users. This category includes, but is not limited to, government, regulatory agencies (state and federal), researchers, other organizations and associations, and/or consumers.