IBIS Open Forum Minutes

Meeting Date: **August 26, 2011**
Meeting Location: **Teleconference**

VOTING MEMBERS AND 2011 PARTICIPANTS

Agilent	Radek Biernacki*, Fangyi Rao, Amolak Badesha
Altera	Hui Fu, Zhuyuan Liu, Julia Nekrylova
AMD	Nam Nguyen
Ansys (Ansoft)	Samuel Martens
Apple Computer	(Matt Herndon)
Applied Simulation Technology	Norio Matsui
Cadence Design Systems	Terry Jernberg, Ambrish Varma, Dennis Nagle, Martin Biehl, Yukio Masuko
Cisco Systems	[Syed Huq], [Mike LaBonte], Luis Boluna, Ashwin Vasudevan, Zhiping Yang
Ericsson	Anders Ekholm
Freescale	(Jon Burnett)
Green Streak Programs	Lynne Green
Huawei Technologies	Xiaoqing Dong
IBM	Adge Hawes*, Greg Edlund
Infineon Technologies AG	(Christian Sporrer)
Intel Corporation	Michael Mirmak*, Udy Shrivastava, Heather Monigan
IO Methodology	Lance Wang
LSI	Brian Burdick*
Mentor Graphics	Arpad Muranyi*, Ed Bartlett, Vladimir Dmitriev-Zdorov, Steve Kaufer, Chuck Ferry
Micron Technology	Randy Wolff*, Andrea Spiezia, Roberto Izzi, Aniello Viscardi, Giovanni Guerra, Francesco Madonna, Giuseppe Fusillo
National Semiconductor	Hsinho Wu, Pegah Alavi, John Goldie
Nokia Siemens Networks GmbH	Eckhard Lenski*
Signal Integrity Software	Walter Katz*, Todd Westerhoff, Mike Steinberger, Barry Katz
Sigrity	Raymond Chen, Kumar Keshavan, Yingxin Sun
Synopsys	Andy Tai, Ted Mido, Scott Wedge
Teraspeed Consulting Group	Bob Ross*, Kellee Crisafulli, Tom Dagostino, Scott McMorrow
Texas Instruments	Casey Morrison, Alfred Chong
Toshiba	(Tetsuya Endo)
Xilinx	(Raymond Anderson)
ZTE	Bi Yi*
Zuken	(Michael Schaeder)

OTHER PARTICIPANTS IN 2011

AET	Mikio Kiyono
Arrow Electronics	Ian Dodd
Avago	Weiping He, Minh Quach, Sari Tocco
Bayside Design	Elliot Nahas
Broadcom	Mohammad Ali
CST	Martin Schauer
Exar Corporation	Helen Nguyen
Granite River Labs	Johnson Tan, Mike Engbretson, Quintin Anderson
High Speed Design Center	Ben Chia
ICT-Lanto	Steven Wong
JEITA	Atsushi Ishikawa
KEI Systems	Shinichi Maeda
Maxim Integrated Products	Hassan Rafat
Mindspeed	Jeff Li, Lyn Wang
NetLogic	Ryan Coutts, Antonis Orphanou
Oracle	Gustav Blando
Politecnico di Torino	Igor Stievano, Stefano Grivet-Talocia
Pristine Signals	AbdulRahman (Abbey) Rafiq
QLogic	David Choe, James Zhou*
Renesas Electronics	Takuji Komeda
Samsung Electronics	Il Seong
Siemens	Manfred Maurer
Simberian	Yuriy Shlepnev
ST Microelectronics	Fabio Brina, Alan Smith
TechAmerica	(Chris Denham)
Thales Communication	Alexandre Amedeo, Cyrip Chastang
University of Illinois	Jose Schutt-Aine
University of L'Aquila	Danilo di Febo
Vitesse Semiconductor	Siris Tsang
Independent	Yoichi Niioka, Mike LaBonte*

In the list above, attendees at the meeting 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 bridge numbers for future IBIS teleconferences are as follows:

Date	Meeting Number	Meeting Password
September 16, 2011	205 475 958	IBIS

For teleconference dial-in information, use the password at the following website:

All teleconference meetings are 8:00 AM to 9:55 AM 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. When calling into the meeting, follow the prompts to enter the meeting ID. For new, local international dial-in numbers, please reference the bridge numbers provided by Cisco Systems at the following link:

http://www.cisco.com/web/about/doing_business/conferencing/index.html

NOTE: "AR" = Action Required.

INTRODUCTIONS AND MEETING QUORUM
Bi Yi is a new attendee and joined from ZTE.

CALL FOR PATENTS
Michael Mirmak called for any patents or pending patents related to the IBIS 3.2, IBIS 4.2, IBIS 5.0, Touchstone 2.0 or ICM 1.1 specifications. No patents were declared.

REVIEW OF MINUTES AND ARS
Randy Wolff called for comments regarding the minutes of the August 5, 2011 IBIS Open Forum teleconference. Randy noted that Eckhard Lenski found a typo of Nokia Siemens Networks in the BIRD132 voting list. The minutes were approved with the noted change.

MEMBERSHIP STATUS AND TREASURER'S REPORT
Bob Ross reported that he received a new report showing Altera as a new member. Altera will be moved to the voting list as a half-year member. We now have 23 paid members according to records, and Bob is tracking down others who have intended to pay. We still need to track down 7 memberships.

WEB PAGE UPDATES
Mike LaBonte reported that he made small updates on the summits page. There were also changes to the roster page and the member poster page due to changing membership. He reported that MANTIS is an online BUG tracking system that we are experimenting with using for revisions of documents. He played around with using it for QUAILs.

MAILING LIST ADMINISTRATION
Mike LaBonte reported that the mailing list is running smoothly lately. It has had a little less trouble than normal. There were a few additions and removals from the list. Overall the number of members on the list has gone up.

MODEL LIBRARY UPDATE
No update.

MISCELLANY/ANNOUNCEMENTS
None.

OPENS FOR NEW ISSUES
None.

INTERNATIONAL/EXTERNAL ACTIVITIES
- P1735 Encryption
No update. The IEEE Study Group on Encryption web reflector archives are found at:

> http://www.eda-stds.org/ip-encrypt/hm/

- VHDL-AMS Table-Driven Models
Arpad Muranyi noted that there was a meeting on Monday. The new table keyword in VHDL-AMS will not read in IBIS tables directly, but this could be accomplished through a Perl script. The function will be similar to the function in Verilog-AMS.

More information can be found at:

> http://www.eda.org/twiki/bin/view.cgi/P10761/ProjectsArea#Table_driven_Modeling_Champion_J

- Conferences
The 1st International IEEE Workshop on Chip-Packaging Co-Design for High Performance Electronic Systems will be held September 19-20, 2011 in Santa Clara, California. There may be topics of interest to IBIS. More information can be found at:

> http://ieee-cpcw.org

EPEPS (Electrical Performance of Electronic Packaging and Systems) will be held October 23-26 in San Jose, California but will not feature an official IBIS presence. The event will take place too close to the IBIS Summits planned for Asia. More information can be found at:

> http://epeps.ece.illinois.edu/

EMCCompo2011, the 8th International Workshop on Electromagnetic Compatibility of Integrated Circuits, will be held in Dubrovnik, Croatia, November 6-9, 2011. More information can be found at:

> http://www.emccompo2011.org

EDAPS (Electrical Design of Advanced Packaging & Systems) will be held December 12-14 in Hangzhou, PRC. More information can be found at:

http://www.edaps2011.org

Official IBIS participation is not planned for any of the events above, though individual papers and discussion on IBIS are encouraged. These are events with refereed submissions, with deadlines either pending or already passed.

- Press Update
Bob Ross noted a paper from NCSU that covers equation based IBIS models and references several IBIS members, documents, and the macromodel library; and also shows Verilog-A implementation. Paper information is: T. Zhu, M.B. Steer, P.D. Franzon, "Accurate and Scalable IO Buffer Macromodel Based on Surrogate Modeling," IEEE Transactions on Components, Packaging and Manufacturing Technology, August 2011, pp 1240-1249.

Bob noted another paper on measurement work related to IBIS and other extended I/O Buffer methods and discussed by several authors who participated at the European IBIS Summit meeting in May, 2011. The paper is "Validation by Measurements of an IC Modeling Approach for SiP Applications," IEEE Transactions on Components, Packaging and Manufacturing Technology, August 2011, pp 1214-1225, by R.R. Cunha, H.M. Teixeira, J.C Pedro, I.S. Stievano, L. Rigazio, F.G. Canavero, R. Izzi, F. Vitale, and A. Girardi.

IEC APPROVAL ACTIVITIES
Randy Wolff reported that he and Michael Mirmak had been in contact with Dennis Brophy and Stan Krolikoski recently. After the IEC National Body meeting, Dennis reported that the IEC recommended that IBIS go through the dual logo process with the IEEE DASC.   Stan offered to help start this process. Michael and Randy began preparing a PAR document to initiate a project with IEEE.

Michael noted that IEC approval does have value to members for the ability to cite IBIS as an international standard. Submission of IBIS as an IEEE standard through DASC does not affect how IBIS works or any of our rules. The process begins with the DASC forming a working group to look over the specification followed by a balloting group. We are working through potential issues between ANSI and IEEE. If a PAR is in progress with IEEE, there may be some discussion of this topic at the IEC meeting in Seoul next month. Mike LaBonte wondered if we needed a work-in-progress page to document the history. Michael thought this was a good idea. He shared the PAR document draft. Bob Ross felt it was worth trying for the IEEE standardization. If this resulted in comments requesting changes to IBIS then we should probably drop the attempt. He noted that he did not see much value in IEC standardization. Michael added that the DIN (Deutsches Institut für Normung) Germany once approved IBIS itself. Radek Biernacki asked why the Computer Society is a sponsor of the IEEE standardization. Michael noted that there is a relationship between DASC and the Computer Society. Bob asked about the type of ballot being Entity based. Michael responded that you can have Entity or Individual based ballots. The working group formed for approval of IBIS would be formed on an Entity basis similar to how IBIS is structured.

TECHAMERICA UPDATE

Michael Mirmak noted that efforts with TechAmerica have been related to the IEEE DASC standardization activities.

KAVI members' login is at:

http://workspace.techamerica.org/apps/org/workgroup/ibis-members

DASC & IEEE RELATIONSHIP DISCUSSION
Discussion was covered in the IEC Approval Activities notes.

SUMMIT STATUS
- Asian IBIS Summit – Shanghai
The Shanghai IBIS Summit is scheduled for Tuesday, November 15 at the Parkyard Hotel. The first announcement for the Shanghai event has gone out. Sponsors include Huawei Technologies, Agilent Technologies, Ansys, Cadence Design Systems, Intel Corp., IO Methodology, Sigrity, Synopsys, ZTE Corporation and others to be determined.

- Asian IBIS Summit –Yokohama
The meeting is November 18 in Yokohama and corresponds with a JEITA conference. The meeting may run from 1:30pm to 6:00pm. Bob Ross is looking for a room for the Yokohama event through JEITA.

- Asian IBIS Summit – Taipei
The meeting is scheduled for November 21. There are 7 sponsors including Agilent Technologies, Avant Technology (IO Methodology), Cadence, Foxconn Technology Group, Intel Corporation, Sigrity, Synopsys and others to be determined.

Sponsorship opportunities for all upcoming IBIS summits are available, with sponsors receiving free mentions in the minutes, agenda, and other announcements. This includes upcoming events in Asia. Contact the IBIS Board for further details.

IBIS QUALITY TASK GROUP
Mike LaBonte reported that activity recently has been about AMI quality. They are starting a checklist with help from Greg Edlund. James Zhou created an overview of the AMI process that they are using to look for areas of addressing quality in AMI. The group is meeting on Tuesdays at 8:00AM PDT.

The Quality Task Group checklist and other documentation can be found at:

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

IBIS MODEL REVIEW TASK GROUP
No update.

ADVANCED TECHNOLOGY MODELING TASK GROUP

Arpad Muranyi reported that the group is working on new features for IBIS 5.2 with jitter and backchannel proposals for IBIS-AMI.

Task group material can be found at:

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

INTERCONNECT TASK GROUP

The group has suspended the meeting to use the time slot for Editorial task group meetings. Actions are pending on IBIS-ISS in the Open Forum.

Task group material can be found at:

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

IBIS EDITORIAL TASK GROUP

Michael Mirmak reported that the group is going through pass by pass of the document. They are working on sections 6C and 10 of IBIS 5.0 currently.

The current IBIS 5.0 reformatting documentation can be reviewed at the following new location:

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

The old link is being maintained, to avoid breaking existing references:

http://www.eda.org/ibis/reformat_wip/

NEW ADMINISTRATIVE ISSUES

Mike LaBonte showed a live demonstration of the MANTIS system. Eda.org has created an IBIS project for us. To test it out he made his own MANTIS project (not on eda.org) and created sub-projects such as IBIS ISS, IBIS Quality and IBIS Spec as well as an IBIS Tools sub-project to cover IBISCHK and other parsers. He showed an example of a QUAIL that he entered into the system. He showed an example of filling out an issue report. Mike is open to comments on improving the system. He will need to get approval from the eda.org administrators to create a similar system on eda.org. Bob Ross added that we could use this system with new BIRDs and maybe eventually add all the older BIRDs. Arpad Muranyi asked how he could see IBIS on MANTIS. Mike noted that the MANTIS system he setup is temporary and not on eda.org.

BIRD116: ADD IBIS-ISS TO [EXTERNAL MODEL] AND [EXTERNAL CIRCUIT] AS A SUPPORTED LANGUAGE

Walter Katz and Arpad Muranyi moved that BIRDs 116-118, 121-125,128, 129 and 131 be tabled indefinitely until a motion is made at a future meeting to un-table. Mike LaBonte seconded the motion. No objections were raised.

BIRD117.3: PARAMETERIZE A_TO_D AND D_TO_A CONVERTERS
Discussion was tabled.

BIRD118.2: ANALOG PARAMETER ASSIGNMENTS
Discussion was tabled.

BIRD121.1: IBIS-AMI NEW RESERVED PARAMETERS FOR DATA MANAGEMENT
Discussion was tabled.

BIRD122: IBIS-AMI NEW RESERVED PARAMETERS FOR ANALOG MODELING
Discussion was tabled.

BIRD123.1: IBIS-AMI NEW RESERVED PARAMETERS FOR JITTER/NOISE
Discussion was tabled.

BIRD124: IBIS-AMI NEW RESERVED PARAMETERS FOR DEPENDENCY TABLES
Discussion was tabled.

BIRD125.1: MAKE IBIS-ISS AVAILABLE FOR IBIS PACKAGE MODELING
Discussion was tabled.

BIRD127.2: IBIS-AMI TYPOGRAPHICAL CORRECTIONS
Arpad Muranyi introduced the changes made to add requirements to the string passed between the EDA tool and the AMI executable model. The string must always include the root name of the parameter tree. Arpad moved to schedule the BIRD for a vote at the next meeting. Bob seconded the motion. There were no objections.

BIRD128: ALLOW AMI_PARAMETERS_OUT TO PASS AMI_PARAMETERS_IN DATA ON CALLS TO AMI_GETWAVE
Discussion was tabled.

BIRD129: ADD "POLARITY" ARGUMENT TO D_TO_A CONVERTERS

Discussion was tabled.

BIRD 131: IBIS-AMI REPEATERS

Discussion was tabled.

BIRD133: MODEL CORNER C_COMP

Arpad Muranyi noted that he recalled the topic was supposed to be discussed over the reflector. Those with questions should start them over email. Bob Ross took the AR to start an email discussion.

BIRD135.1: ADD BOOLEAN TO BNF FOR IBIS-AMI

Arpad Muranyi noted that he has not received any comments or questions on the BIRD. Michael Mirmak reported that the planned vote was not scheduled in the agenda. Radek Biernacki and Bob Ross moved to delay the votes on BIRD135.1, 136 and 137.1 until the next meeting. Arpad seconded. There were no objections.

BIRD136: DEFINING RELATIONSHIPS BETWEEN TYPE AND FORMAT

No discussion. A vote is scheduled for the next meeting.

BIRD137.1: AMI_PARAMETERS_IN, AMI_PARAMETERS_OUT, MSG CLARIFICATIONS

Adge Hawes asked if existing models have to change due to this BIRD if you have no AMI_Parameters_out. Arpad Muranyi clarified that these rules would be in IBIS 5.1 and AMI models of IBIS version 5.0 do not need to follow these rules. Bob Ross added that maybe a statement should be added to define what is allowed in 5.0 models versus 5.1 models. Arpad and Radek did not feel that this was necessary. Arpad added that most tools should support rules of 5.0 differently from 5.1. Bob moved to move the discussion to the ATM task group. Adge Hawes seconded. There were no objections.

BIRD138: IBIS-AMI SECTION 6C TABLES UPDATE

Arpad Muranyi moved to schedule a vote for the next meeting. Mike LaBonte seconded. There were no objections.

BIRD139.1: RESERVED_PARAMETERS ORDER

Bob Ross noted that this BIRD requires that the Reserved_Parameters section be included before the Model_Specific section. Arpad Muranyi asked if this BIRD implies that 5.0 version models can have these parameters in any order. Bob agreed and felt that this BIRD clearly states the rules for 5.1 versus 5.0 models.

Arpad moved to schedule a vote for the next meeting. Radek Biernacki seconded. There were no objections.

BIRD140: FORMAT CORNER AND RANGE CLARIFICATION FOR IBIS-AMI

Arpad Muranyi moved to table discussion on the BIRD. Bob Ross seconded. There were no objections.

BIRD141: [COMPOSITE CURRENT] CLARIFICATIONS

Randy Wolff noted that there were no comments. Randy moved to schedule a vote for the next meeting. Bob Ross seconded. There were no objections.

BIRD142: CLARIFICATIONS OF [TEST DATA] AND [TEST LOAD] SCOPING

Bob Ross noted that there were no changes or comments on the BIRD. Bob moved to schedule a vote for the next meeting. Radek Biernacki seconded. There were no objections.

BIRD143: CORRECTING THE RULES FOR AMI_CLOSE

Adge Hawes noted that this does break 5.0 models. Michael Mirmak added that this may require a link to AMI_Version.

Bob Ross moved to move discussion on the BIRD to the ATM task group. Adge seconded. There were no objections.

TSIRD3: CLARIFY S-PARAMETER DEFINITION

Michael Mirmak noted that this TSIRD adds a new section to Touchstone 2.0. No comments have been received.

IBIS-ISS SPECIFICATION DRAFT 1.5 REVIEW

Michael Mirmak issued the second call for comments. He noted that we traditionally issue three calls for comments before voting on new specifications. Walter Katz noted that he thought we should approve it as a preliminary specification so that if we find issues we don't have to update it as a new version with backwards compatibility. Bob Ross did not agree with this approach and felt we should approve it or not approve it and continue to review it.

Bob Ross moved to bring up the third call for comments at the next meeting. Radek Biernacki seconded. There were no objections.

The IBIS-ISS draft 1.5 specification is available at:

   http://www.eda.org/ibis/ibis-iss_wip/

IBISCHK5 BUG STATUS

No new BUGs. Bob Ross added that a new parser project will start soon to fix open BUGs.

NEW TECHNICAL ISSUES
None.

NEXT MEETING
The next IBIS Open Forum teleconference will be held September 16, 2011 from 8:00 to 10:00 AM US Pacific Time. Votes on BIRD127.2, BIRD135.1, BIRD136, BIRD137.1, BIRD138, BIRD139.1, BIRD141 and BIRD142 are scheduled. Mike LaBonte moved to adjourn. Randy Wolff seconded. There were no objections.

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NOTES

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This meeting was conducted in accordance with the TechAmerica Legal Guides and
TechAmerica Manual of Organization and Procedure.

The following e-mail addresses are used:

majordomo@eda.org
        In the body, for the IBIS Open Forum Reflector:
        subscribe ibis <your e-mail address>

        In the body, for the IBIS Users' Group Reflector:
        subscribe ibis-users <your e-mail address>

        Help and other commands:
        help

ibis-request@eda.org
        To join, change, or drop from either or both:
        IBIS Open Forum Reflector (ibis@eda.org)
        IBIS Users' Group Reflector (ibis-users@eda.org)
        State your request.

ibis-info@eda.org
        To obtain general information about IBIS, to ask specific questions for individual
        response, and to inquire about joining the EIA-IBIS Open Forum as a full Member.

ibis@eda.org
        To send a message to the general IBIS Open Forum Reflector. This is used mostly for
        IBIS Standardization business and future IBIS technical enhancements. Job posting
        information is not permitted.

ibis-users@eda.org
        To send a message to the IBIS Users' Group Reflector. This is used mostly for IBIS
        clarification, current modeling issues, and general user concerns. Job posting
        information is not permitted.

ibis-bug@eda.org
        To report ibischk parser BUGs as well as tschk2 parser BUGs. The BUG Report Form
        for ibischk resides along with reported BUGs at:

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

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

http://www.eda.org/ibis/tschk_bugs/
http://www.eda.org/ibis/tschk_bugs/bugform.txt

icm-bug@eda.org

To report icmchk1 parser BUGs. The BUG Report Form resides along with reported BUGs at:

http://www.eda.org/ibis/icm_bugs/
http://www.eda.org/ibis/icm_bugs/icm_bugform.txt

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

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

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

http://www.eda.org/ibis

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

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

To create an account on the TechAmerica KAVI workspace, check out:

http://workspace.techamerica.org/kwspub/join/

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IBIS CURRENT MEMBER VOTING STATUS

I/O Buffer Information Specification Committee (IBIS)

Organization	Interest Category	Standards Ballot Voting Status	June 24, 2011	July 15, 2011	August 5, 2011	August 26, 2011
Advanced Micro Devices	Producer	Active	X	X	X	-
Agilent Technologies	User	Active	X	X	X	X
Altera	Producer	Inactive	-	-	-	-
Ansys	User	Inactive	-	-	-	-
Apple Computer	User	Inactive	-	-	-	-
Applied Simulation Technology	User	Inactive	-	-	-	-
Cadence Design Systems	User	Inactive	X	-	-	-
Cisco Systems	User	Active	-	X	X	-
Ericsson	Producer	Inactive	-	-	-	-
Freescale	Producer	Inactive	-	-	-	-
Green Streak Programs	General Interest	Inactive	-	-	-	-
Huawei Technologies	Producer	Inactive	-	-	-	-
IBM	Producer	Active	X	-	X	X
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	X	X
IO Methodology	User	Inactive	X	X	-	-
LSI	Producer	Active	-	-	X	X
Mentor Graphics	User	Active	X	X	X	X
Micron Technology	Producer	Active	-	X	X	X
National Semiconductor	Producer	Inactive	-	-	-	-
Nokia Siemens Networks	Producer	Active	X	-	X	X
Signal Integrity Software	User	Active	X	X	X	X
Sigrity	User	Inactive	-	-	-	-
Synopsys	User	Inactive	-	-	-	-
Teraspeed Consulting	General Interest	Active	X	X	X	X
Texas Instruments	Producer	Inactive	-	-	-	-
Toshiba	Producer	Inactive	-	-	-	-
Xilinx	Producer	Inactive	-	-	-	-
ZTE	User	Inactive	-	-	-	X
Zuken	User	Inactive	-	-	-	-

CRITERIA FOR MEMBER IN GOOD STANDING:
- MUST ATTEND TWO CONSECUTIVE MEETINGS TO ESTABLISH VOTING MEMBERSHIP
- MEMBERSHIP DUES CURRENT
- MUST NOT MISS TWO CONSECUTIVE MEETINGS

INTEREST CATEGORIES ASSOCIATED WITH TECHAMERICA BALLOT VOTING ARE:
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- 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.