

**(Unconfirmed Minutes)**  
**IEEE P802.3bn EPoC PHY Task Force**  
**October 28-29, 2012,**  
**Hangzhou, China**  
**Chair: Mark Laubach**  
**Recording Secretary: Duane Remein**

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## Opening

9:00 AM. The chair called the meeting to order and thanked the Huawei for hosting the meeting.

Mr. Jin Naihui, Co-chair and Secretary General International Coverage and Transmission Conference gave a short welcome talk to the group. ICTC invited the attendees of the IEEE 802.3bn EPoC task force to an MSOs Forum meeting to be held Monday 29 Oct 4:00 PM to 6:00 PM following the EPoC meeting.

Introductions were held.

The Chair reviewed IEEE 802.3 task force decorum. The chair asked if anyone objected to the taking of pictures, there were no objections. A member of the press was present and did announce herself.

Voting in the meeting is to be 802.3 Working Group voters only.

## Motion #1

Move to approve the agenda.

Moved: Duane Remein

Second: Marek Hajduczenia

Approved by voice vote without opposition

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## Motion #2

Move to approve the minutes as amended in unconfirmed\_minutes\_01a.pdf.

Moved: Duane Remein

Second: Alan Brown

Approved by voice vote without opposition

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The Chair reviewed the goals of the meeting, Reflector and WEB area, meeting ground rules, attendance, IEEE structure, and IEEE By Laws & Rules.

## Call for Patents

The Chair displayed the Patent slides [25 March 2008 (updated 29 March 2011)]. The slides were paraphrased in Chinese for the benefit of those attendees that did not speak English.

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The Chair made a call for Potentially Essential Patents; there were no responses.

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The Chair reviewed the affiliation disclosure by-laws, and attendance policy.

The Chair reviewed the IEEE 802.3 Standards Process flow chart. The Task Force's PAR, 5 Criteria and Objectives were also reviewed along with the TF time line. It was noted how aggressive the timeline is. The chair reviewed the 8 technical motions passed in the Geneva meeting, noting that these would be located at the Task Force [Technical Decision](#) area on the WEB page. The Chair noted the existing Ad Hoc committees and their officers.

## Presentations

The Chair reviewed the schedule for meeting presentations.

### Motion #3

Moved to approve the presentation agenda with that a presentation from Mr. Ru Wei Gaung (OCI) replacing the presentation from Mr. Ed Mallette.

Moved: Marek Hajduczenia

Second: Ed Boyd

Approved by voice vote without opposition

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#### [Ad Hoc report: Evaluation Criteria and Requirements](#)

Steve Shellhammer

Qualcomm

This report covered the Evaluation Criteria and Requirements Ad Hoc committee progress and activities. There was a short discussion on the possibility of holding Ad-Hoc calls that were convenient for Chinese participants.

#### [Ad Hoc report: PHY Link](#)

Ed Boyd

Broadcom

This report covered the PHY Link Ad Hoc progress and activities. It was mentioned that a call could be arranged for the convenience of Chinese participants if requested.

#### [Ad Hoc report: Channel Model](#)

Duane Remein

Huawei

This report covered the Channel Model Ad Hoc progress and activities. It was mentioned that a call could be arranged for the convenience of Chinese participants if requested.

#### [Ad Hoc report: RF Spectrum](#)

Steve Shellhammer

Qualcomm

This report covered the RF Spectrum Ad Hoc progress and activities. It was mentioned that a call could be arranged for the convenience of Chinese participants if requested.

#### [Potential IEEE P802.3bn architecture](#)

David Law

HP

This presentation took a very high level view of EPoC, both from the FDD and TDD view, and suggested new and modified clauses to affect the new standard. The presentation suggested that all changes for TDD could be isolated to a single new clause covering MPCP for TDD. This new clause may require a modification the objective for minimal changes to the MPCP by the Working Group.

#### [Multiple Modulation Profiles for EPOC](#)

Eugene Dai,

Cox Communications

This presentation discussed multiple modulation profiles for EPoC. The presentation concluded that; 1) service providers are obligated to end-users by service level agreement not by PHY modulation profiles, 2) PHY modulation profiles do not have a direct link with service level agreement, 3) Considering fairness, a higher modulation profile has no notable impact on an end-user service level agreement compared with a lower profile, 4) the complexity and impact of multi-profiles at the PHY, MAC and system level need further study, 5) using a single profile with higher order modulation and stronger FEC may provide a balanced solution between spectrum efficiency and complexity. Due to time limitations there was little discussion on this presentation.

#### [EPoC Requirement from JSCN](#)

Gao Xiaojun

Jiangsu Province Cable Network Company

This presentation discussed system requirements of an EPoC system from the perspective of JSCN. It was noted that some of these requirements are system level requirements and did not apply directly to 802.3bn EPoC project but should be considered in the development of the standard.

#### [Cable network introduction, EPOC requirements and expectation from SXBCTV](#)

Xu Qiheng

Shanxi Province Broadcast Cable TV Network Company

This presentation provided requirements from the perspective of SXBCTV. Many of these requirements were system level needs that EPoC should consider in the development of the standard.

#### [Discussion on EPoC PHY Functions](#)

Rujian Lin

Luster Teraband Photonics Co., Ltd.

This presentation discussed various aspects of the EPoC effort. Included topics included separation of PHY and MAC Control functions, Channel link and MAC Discovery, PHY probing, Adaptive profiles, power leveling, Functional block diagram, RF Channel maintenance and OAM.

The Chair was temporarily delegated to Steve Shellhammer.

#### [Spectrum planning and access network architecture from GZCTV](#)

Zhang Bo

GuiZhou Province Cable TV Network Company

This presentation covered the RF Spectrum use and network topology in the GZTV network.

#### [EPoC Frequency Bands and Center Frequencies](#)

Juan Montojo, Masoud Zargari, Alex Liu

Qualcomm

This presentation discussed several aspects of RF Spectrum including Definition of terms, spectrum usage, CNU categories, and Exclusion bands. The presentation concluded that the specification should support operation at higher frequencies (~1800 MHz) from day one to avoid the need to amend the standard amendment in the future. The presentation also indicated that CNUs with different RF capabilities should be able to coexist. It was also suggested that signaling would be required between

CLT and CNU to communicate RF spectrum capabilities and usage. It was noted that per input from Chinese MSOs the TDD band should extend down to low frequencies (~5 MHz).

### [EPoC Deployment Scenarios](#)

Bill Powell, Randy Sharpe

Alcatel-Lucent

This presentation examined several use cases for EPoC with a focus on RF Spectrum utilization. It was noted that in the Chinese market TDD would occupy either the ~5-200 MHz band or the ~750-1050 MHz band (with the latter allocated to HiNOC). Feedback requested on slide 9 indicated that some Chinese MSOs may use TDD in high band and others in low band. Several Chinese MSO's expressed the need for a "carrier class" data over COAX solution. Important points include time to market, cost, fiber like speeds and QOS.

The chair responsibilities were resumed by Mark Laubach.

The meeting recessed for the day at 1930 and reconvened at 0905 on Monday 29 Oct. The Chair reviewed attendance recording procedures, also noting there was a non-IEEE MSO Forum meeting following the close of the official Task Force meeting and all participants were kindly invited to attend this meeting.

### [Cable channel modeling based on Chinese MSO's cable network](#)

Wu Guangsheng

Huawei

This presentation reviewed work done with a number of Chinese MSOs pertaining to the channel model.

The material covered the following topics:

- network topology,
- component measurements and modeling,
- measurement and simulation of insertion loss, group delay, and micro-reflections,
- noise and interference testing and SNR estimation

The conclusions were that under Node+0/+1 scenarios, the micro-reflection is not significant under 1.2GHz, but grows significantly between 1.2G and 1.6GHz. Based on SNR estimation results, adaptive modulation is very important for the downstream channel.

### [Cable channel test report by XYBN](#)

Hu Xiaoping

Xiangyang Cable Network, Hubei Province

This presentation provided an overview the XYBN cable network and future spectrum planning. The presentation also included test results from two sites pertinent to the Channel Model. Parameters tested included noise / interference and S parameters, group delay, and micro-reflection analysis. The conclusions were:

- Theoretical analysis and measurements show that the noise floor of the passive network is very close to the thermal noise floor. If the receiver level can be guaranteed, SNR can easily reach more than 40dB.
- In the passive coaxial network, the modulation order can up to 4096QAM
- Adaptive modulation is very important because interference is different between different sites and times.
- Connector caused problems are very common and have serious impacts on network performance.

- Micro-reflections under 1GHz are within the parameters defined in IEEE802.14.
- Network performance at 1GHz-1.2GHz slightly degrades, performance at 1.2-1.3GHz degrades sharply for both transmission loss and micro-reflections.

#### [HFC network introduction and EPOC requirements from ZSCN](#)

Zhang Dongqing

Zhongshan Cable Network, Guangdong Province

This presentation gave an overview and test results from two sites within the ZSCN network. Parameters measured include CNR, noise/interference, S parameter, group delay, and micro-reflections. It was noted that many ports on the measured sites were open, representing a worst case scenario. The presentation concluded that:

- Under an N+0 scenario: 1) the EPOC transmitter power could be equal to DVB-C (104dB  $\mu$ /8MHz), and the transmission loss is approximately 40dB@860MHz,  $\leq$ 45dB@1200MHz, and CNU receiver signal level  $\geq$ 69dB $\mu$  per 8MHz, 2) the channel SNR may be higher than 56dB
- Under N+1 scenario: the test SNR is almost higher than 40dB.
- In the Zhongshan cable network, with OFDM PHY, the modulation order can reach 4096QAM

#### [MDU cable network channel S parameter measurements - Tested in Wuxi city, Jiangsu province](#)

Gao Xiaojun

Jiangsu Province Cable Network Company

This presentation provided S parameters and micro reflection data from two tested sites of the JPCNC network. Conclusions of the presentation were:

- Bi-directional characteristics of passive coax networks are basically the same ( $S_{21}=S_{12}$ )
- Channel transmission loss gradually decreases above 1.5GHz, and decreases rapidly between 1.5G and 1.8GHz according to the test results at test site 2.
- The channel response is quite flat below 1GHz but above 1GHz has significant fluctuations.
- Parts of the network experience strong micro-reflections
- Passive coaxial network channel characteristics per test results are:
  - Multi path (micro reflection) do exist in passive cable network
    - Poor connections can cause serious reflections.
    - Impedance mismatch and poor connections cause frequency selective fading.
- Poor network consistency: channel performances differ significantly on different spectrum
- Cable channel changes slowly over time.

#### [OCN Cable Access Planning](#)

Ru Wei Guang

Oriental Cable Networks

This presentation illustrated the current and planned RF spectrum use by OCN in their network.

#### [Brief introduction on China Cable network and requirements](#)

Yao Yong

China Radio & TV Association Technical Committee

This presentation gave a summary of high level requirements from a number of Chinese MSOs. Common requirements are:

- Typically N+0 or N+1, rarely with N+2
- For residential services.
- Available spectrum: 750/860M to 1200/1300MHz
- Data rate: CLT 1Gbps or more, CNU 100Mbps to 1Gbps
- Duplex: FDD and TDD

- CNU number: 1GEPoC less than 128 CNU's, 10GEPoC less than 512 CNU's
- CLT/OCU Architecture: Relay/bridge/half-bridge are all acceptable. The most important is compatible CNU and management.
- Unify DOCSIS/EPoC/HiNoC

## Closing

It was noted that the Ad Hoc committees would like to schedule a teleconference convenient to participants in ASIA.

### Straw Poll #1

Four times were proposed:

Pacific	China	
Tues 5PM	Wed 8 AM	6
Tues 6 PM	Wed 9 AM	19
Thurs 5 PM	Fri 8 AM	8
Thurs 6 PM	Fri 9 AM	19

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#### Future meetings

Nov 11- 16, 2012	San Antonio
Week of Jan 21, 2013	location TBD
Mar 18-21 2013	Orlando Fla.

### Straw Poll #2

I will attend the Nov Plenary	18
I probably will attend the Nov Plenary	2
I probably will not the Nov Plenary	5
I will not the Nov Plenary	36
I will attend the Jan Interim	16
I probably will attend the Jan Interim	4
I probably will not the Jan Interim	7
I will not the Jan Interim	29

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The Chair thanked and recognized the following:

The meeting Host, especially Hesham ElBakoury and Guangsheng Wu  
 All Presenters and translators  
 Mr. Yao  
 China TV & Radio Association  
 ICTC organizing committee and Mr Jin Naihui

China EPOC Forum  
Academy of Broadcast Science (ABS) of State Administration of Radio Film and Television  
(SARFT)  
Mr. Cui Jingfei Director, ABS, SARFT

## Motion #4

Move to Adjourn

Moved: Ed Boyd  
Second: Jorge Salinger  
Procedural ≥ 50%  
Motion Passed by Voice without opposition

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The meeting was adjourned at.15:38

## Meeting Attendance

The following represents the meeting attendance as initialed in the attendance binder that was passed around the meeting each day.

<u>Lastname</u>	<u>Firstname</u>	<u>Affiliation</u>	<u>Sun</u>	<u>Mon</u>
Barr	David	Entropic Communications	X	X
Bo	Zhang	Guizhou Cable	X	X
Boyd	Ed	Broadcom	X	
Brown	Alan	Aurora Networks	X	X
Cao	Ling	Raisecom Tech	X	X
Chang	Yu	Fiberhome	X	X
Cleng	Jeff	Qualcomm	X	X
Cong	Xu	National Chip	X	X
Cui	Jingfei	Academy of Broadcast Services	X	X
Dai	Eugene	Cox	X	
Deng	Lixia	Peking University	X	X
Deng	Yanjun	Sumavision	X	X
Dong	Liang	Henan Cable Network	X	X
ElBakoury	Hesham	Huawei	X	X
Emmendorfer	Michael	ARRIS	X	X
Fang	Liming	Huawei	X	X
Feng	Hong	Huawei	X	X
Garavaglia	Andrea	Qualcomm	X	X
Ge	Shengbo	Cisco	X	X
Goswami	Sanjay	Broadcom	X	X
Guangseng	Wu	Huawei	X	X
Guo	Yong	ZTE Corp	X	X

<u>Lastname</u>	<u>Firstname</u>	<u>Affiliation</u>	<u>Sun</u>	<u>Mon</u>
Hajduczenia	Marek	ZTE Corp	X	X
Hu	Baomin	YOTC	X	X
Hui	Liang	Binglink Hairer	X	X
Jain	Rajeev	Qualcomm	X	X
Jin	Li	ShangHai B-STAR	X	
Jiqing	Liu	Arris Ch??	X	X
Jun	Xu	Gui	X	X
Kliger	Avi	Broadcom	X	X
Kramer	Glen	Broadcom	X	X
Laubach	Mark	Broadcom	X	X
Law	David	HP	X	X
Li	Li	Suzhou Winpai Tech Co. Ltd	X	X
Li	Wenhao	Raisecom Tech	X	X
Lin	Rujian	Shanghai Luster Teraband Photonics	X	X
Liu	Alex	Qualcomm	X	X
Ma	Weidong	Huawei	X	X
Mallette	Edwin	Bright House Networks	X	X
Martin	James	Anadigics	X	X
Miller	Frank	Huawei	X	X
Montejo	Juan	Qualcomm	X	X
Nan	Li	Guizhou Cable	X	X
Ouyong	Feng	Academy of Broadcast Services	X	X
Powell	Bill	Alcatel-Lucent	X	X
Qu	Tong	Cisco	X	X
Remein	Duane	Huawei	X	X
Reng	Yanjun	Sumavision	X	X
Salinger	Jorge	Comcast	X	X
Schmitt	Matt	CableLabs	X	X
Shellhammer	Steve	Qualcomm	X	X
Shubin	Wu	Fiberhome	X	
Stumpf	Erich	Pacific Broadband Networks	X	X
Stupar	Patrick	Qualcomm	X	X
Tian	Liu	Veste of Science and Technology of China	X	
Tzeng	Samuel	Luster Teraband Photonics	X	
Van Dyke	Daniel	Cisco	X	X
Wang	Chengwei	Cortina Systems	X	x
Wang	Xuan	Cisco	X	X
Wei	Cheng	Zhejiang Cable TV	X	
Wei hua	Zheng	Guangxi Cable Network	X	X
Wenzhao	Lin	Beijing Gehua CATV Network	X	X



<u>Lastname</u>	<u>Firstname</u>	<u>Affiliation</u>	<u>Sun</u>	<u>Mon</u>
XiaoJun	Gao	JiangSu Cable Networks	X	X
XiaoPing	Hu	Hubei Xiangyang Cable Network	X	X
Yao	Yong	SARFT	X	X
Yao	Yonggang	YOTC	X	X
Yong Qing	Tong	Laketune Company	X	
Yu	Jinfei	Technicoloy	X	X
Zang	Maggie	ZTE Corp	X	X
Zhang	Bing	Xidian University	X	X
Zhang	Jiansheng	China Cable Networks Co, LTD	X	X
Zhang	William	MSTAR	X	X
Zhang	Liange	Broadcom	X	
Zhao	Cui	Academy of Broadcast Services	X	X
Zhao	Ghaohue	ASTRI	X	X
Zhao	Yuping	Peking University	X	
Zheng	Xu	Cloud Vision Networks	X	
Zheng	Zhi	YOTC	X	X
Zhonghui	Ren	Hangzhou Cncr-it.w.ltd	X	X
Zhou	Jun	Huawei	X	
Zhu	Liyue	Academy of Broadcast Services	X	X
Zubin	Chu	Fiberhome	X	X