Channel Ad Hoc Meeting Minutes
February 23, 2005

a) Agenda overview presented by Adam Healey
(http://ieee802.org/3/ap/public/channel_adhoc/agenda_c2_0205.pdf)

   i) Reminder to review and comment on draft 0.8 – deadline is March 9th.

   ii) Schelto requested everyone to submit comments as soon as possible to help get them organized before the next meeting.

b) Carry over items

   i) Packaging Effects – Adam summarized "swag" at package model shown in presentation

   ii) Extrapolation to DC

c) Petre Popescu presented a proposal for developing the normative channel model
(http://ieee802.org/3/ap/public/channel_adhoc/popescu_c1_0205.pdf) Questions:

   i) Charles Moore – it appears that the channel compliance would be defined by crosstalk and P_{DFE}, is that correct? Petre – yes.

   ii) Charles Moore – the distinction between HFF and s-parameters is unclear. Petre – will try to clarify.

   iii) Brian Seemann – is the voltage margin the limiting factor? Do we need to account for horizontal margin in any way? Petre – the amplitude and horizontal margin are related.

   iv) Brian Seemann – What if the jitter amplification is non-linear? Petre – have avoided non-linear responses.

   v) Adam Healey – on slide 6, the plot for Tyco's NEXT/FEXT response, did you power the individual aggressors? There don't seem to be enough plots. Petre – the plots are to justify the crosstalk value that has to be accounted for.

   vi) Adam Healey – it seems that the spread should be larger. A particular sequence of symbols would yield a different pattern than the peak impulse response. Have you considered that? Petre – the 3 aggressors should be the maximum impact at any time.

   vii) John D'Ambrosia – there should be 4 aggressors since there are two FEXT sources.

   viii) John D'Ambrosia – are reflections at each end of the channel taken into account? Petre – no, I've assumed perfect source and load 50 Ohm termination. There is no multiple reflection.

   ix) Adam Healey – are you attempting to account for multiple reflections through the power penalty? Petre – yes.

   x) John D'Ambrosia – why are you characterizing the performance of the channel at 100 MHz? Petre – I didn't want to put in DC loss.

d) Adam began discussion of multiple, tangled topics, including package model, Petre's approach, and others (limited to 30 minutes)

   i) How do we get the time domain response?

   (1) The only real question was how to get the DC. Most algorithms are private and not in the public domain.

   (2) We might not even specify the method – what does everyone think?

   (3) Charles Moore advocates the approach that everyone can use whatever method they want.

   (4) Brian Brunn (Xilinx) this seems contradictory – if the method matters, we need to specify the method.

   (5) John D'Ambrosia agreed – we haven't quantified how much of a delta can occur from different techniques.

   (6) Adam Healey – if we do adopt a method, what do we propose?

   (7) Brian – a second order curve should be sufficient.

   (8) Straw poll: Option 1 – we appoint Brian to determine a method to propose or Option 2: we leave it alone:

      (a) Results are 10-6 for option 1. Brian Brunn to put together proposal for next telecom.

   ii) Characterizing the channel in terms of a flat loss at 100 MHz, and the characterization of an ISI penalty after the formulation of a software tool

   (1) Charles Moore – as presented, the assumption of an ideal equalizer and different channels with the same ability to be equalized by an ideal equalizer will respond very differently. Long-term ISI will have a strong effect.

   (2) Adam Healey – how do we define an ideal equalizer? Is it a fixed complexity equalizer?

   (3) Charles – are you recommending something akin to SigInt?

   (4) Adam – not really proposing a specific methodology.

   (5) Charles – some channels are more susceptible to receiver and transmitter reflections, and this is not included in this method.

   (6) Adam – we can do this in steps: if you're comfortable with the fixed complexity equalizer and flat loss characterization, we can cover the multiple reflections separately. Any opposition?

      (a) John D'Ambrosia not comfortable with separation of the ISI penalty.

      (b) Petre – the flat loss is probably the least debatable item

      (c) Charles – the crosstalk handling could be improved. Adam – that's question 4, we'll cover it later.

(d) At the end of the discussion, participants seems comfortable with idea of residual SNR penalty (or similar metric) based a fixed complexity equalizer (FFE and DFE).

iii) Is the impulse response fed into the model a packaged impulse?

    (1) Adam – How do we include transmit and receive effects? Do we use explicit method or budget?

        (a) Charles – SigInt uses the magnitude of the return loss of the channel and the magnitude of the return loss of the receiver and transmitter and multiplying them together. There's no way to get back to an accurate time-domain response. You lose the phase of the reflection.

        (b) Adam – can we afford to lose the phase?

        (c) Bill Peters – the phase of the reflection is very important – it determines when the reflections will occur in your impulse response when you cascade models together.

        (d) Adam – there seem to be 3 versions of this we can do: 1st is the explicit case (anecdotal package set cascaded to calculate result); 2nd take the return loss magnitude function and look at the channel response with zero phase; 3rd is the link-budget-based model which margin for worst-case magnitude and phase alignment

        (e) Pushing further discussion to March 2nd conference call. We need someone to drive a proposal for the call. Adam will summarize the 3 options and continue discussion through the reflector.

iv) Crosstalk metric – how to budget in a normative fashion.

e) John D'Ambrosia presented "Revisiting Channel Model Measurements" (http://ieee802.org/3/ap/public/channel_adhoc/dambrosia_c1_0205.pdf).

  i) Joe Abler – just a note that the signaling ad hoc decided not to include the blocking cap in the model since the general consensus was the main impact would be from the implementation (via, pad, etc.).

  ii) John D'Ambrosia – agreed, this was just some quick and dirty testing

  iii) Nitish Amin – can you please describe the channel? John – it's case 5.

f) Next conference call will be on March 2nd.

Attendance and Straw Poll Results

First	Last	Option #1	Option #2
Joe	Abler		1
Majid	Barazande-Pour		
Rob	Brink		

Brian	Brunn	1	
Joe	Caroselli	1	
Chi-te	Chen	1	
Ashish	Choudhury	1	
John	D'Ambrosia	1	
Badri	Gomatam		
Adam	Healey		
Matt	Hendrick	1	
Sammy	Hindi	1	
Mike	Lerer		1
Cathy	Liu		1
Charles	Moore		1
William	Peters	1	
Petre	Popescu		1
Shannon	Sawyer		1
Brian	Seemann	1	
Jimmy	Sheffield	1	
Dima	Smolyansky		
Schelto	van Doorn		
		10	6