Tutorial n°1
Ethernet controller overview from its datasheet

<mark>Tutorial in autonomy. Information will be required for the 1st lab session</mark>

<mark>Your objective: depict the controller's useful characteristics from its datasheet.</mark>

The DP83816-EX circuit is an Ethernet controller. This circuit is the heart of the Ethernet network interfaces for to embedded PCs. The DP83816-EX controller supports full-duplex and transmit-receive mode to 10/100 Mbps.

We suggest you to study some characteristics of this circuit from its documentation.

Section: General description

Which layers of the OSI model are concerned?

Section: Features

1.   What is the interface bus between the Ethernet controller and the PC?

2.   Is this bus subject to standardization? What kind of standardization? Briefly describe the mission of the commission which supports this standardization (internet search)?

3.   Which networks are supported by this controller?

Section: Connection

The connection between this controller and the physical media is made using an RJ45 connector. Briefly introduce this connector and describe the functionality of each pin (internet search).

Section: Pin description

1.   What is the size of the data bus at the input of the controller?

2.   On which pin a collision is detected?

3.   On which pin the carrier is sensed?

4.   What are the pins for receiving and transmitting data?

Section: Functional description

From figure 3.1, which is the most important block from a transmission theory point of view?

Section 3.1: MAC/BIU

What is the purpose of this block? Do you recognize some features? Which ones?

Section 3.4: Physical Layer

1. Do you recognize some of the features in Figure 3.4? Which ones?

2. For transmission, describe the coding/modulation chain used (Fig 3.4 and Fig 3.6). Give an example for each of the steps in this chain (section 3.9 and Internet search).

3. Why the need to use a DSP (Digital Signal Processor) for the physical layer?

4. Figure 3.12 is interesting; can you comment on it?

Section: Clock Recovery Module

What is the purpose of this block? Explain.