6G Data over Legacy Backplanes

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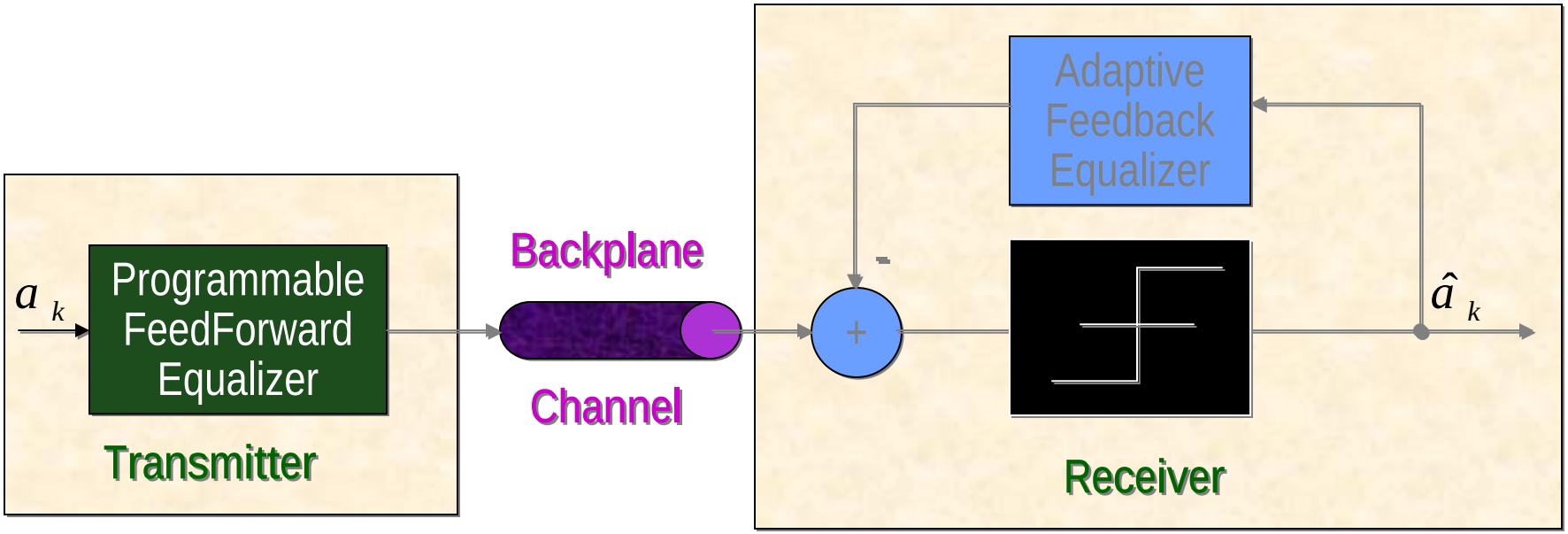
TX FFE (feed-forward equalization) & RX DFE (decision feedback equalization)



- **Combination of FF and FB equalizers work to "remove" ISI (intersymbol interference) caused by high-frequency loss and impedance mismatches.**

- **Possible to have a "closed eye" at the input of the receiver and still decode data properly.**

- **Aligned with OIF CEI 6G-LR specification.**

High Level Specifications

- **Data Rates up to 6.4 Gbps**
- **Signaling over backplanes with >40” FR4 and 2 connectors at target BER<10^{-17}**
- **Designed to work over “legacy” backplanes designed for 2.5Gbps.**
- **Designed to meet OIF 6G-LR specification**
- **Less than 350mW per duplex channel under worst case conditions**

Transmitter

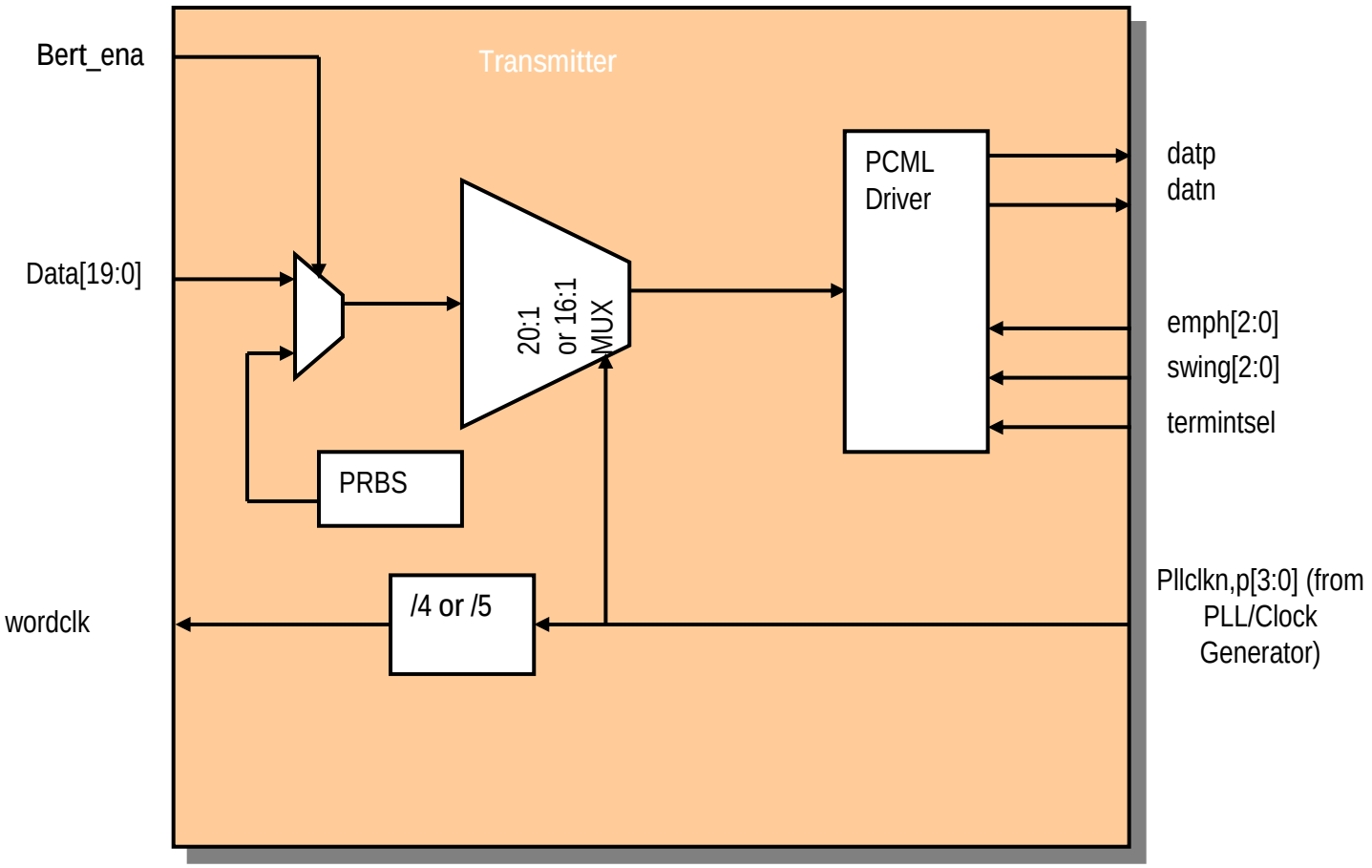


Figure 2: Simplified Transmit block diagram

Receiver

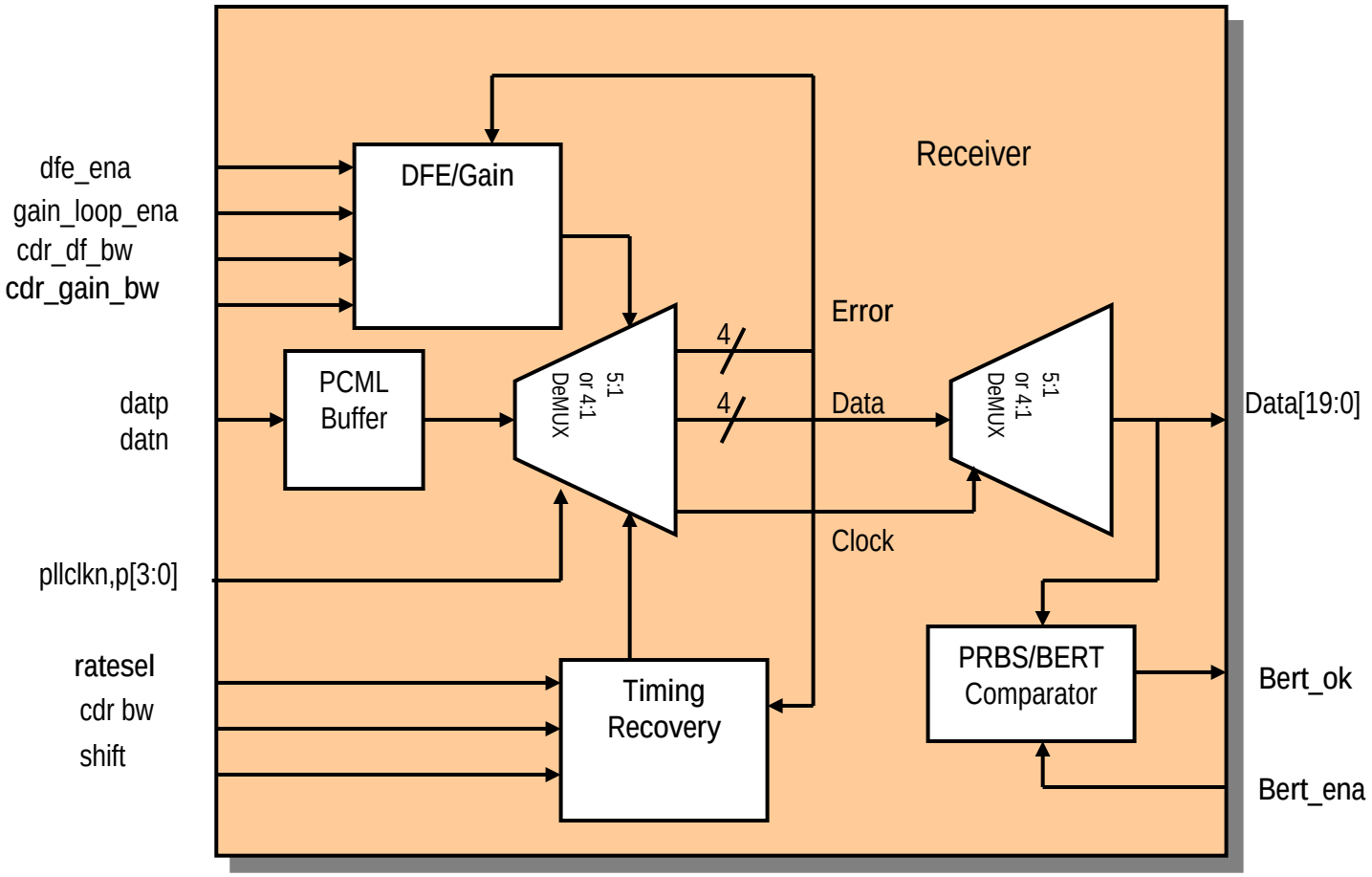


Figure 3: Simplified Receive block diagram

PLL & Test Pattern Logic

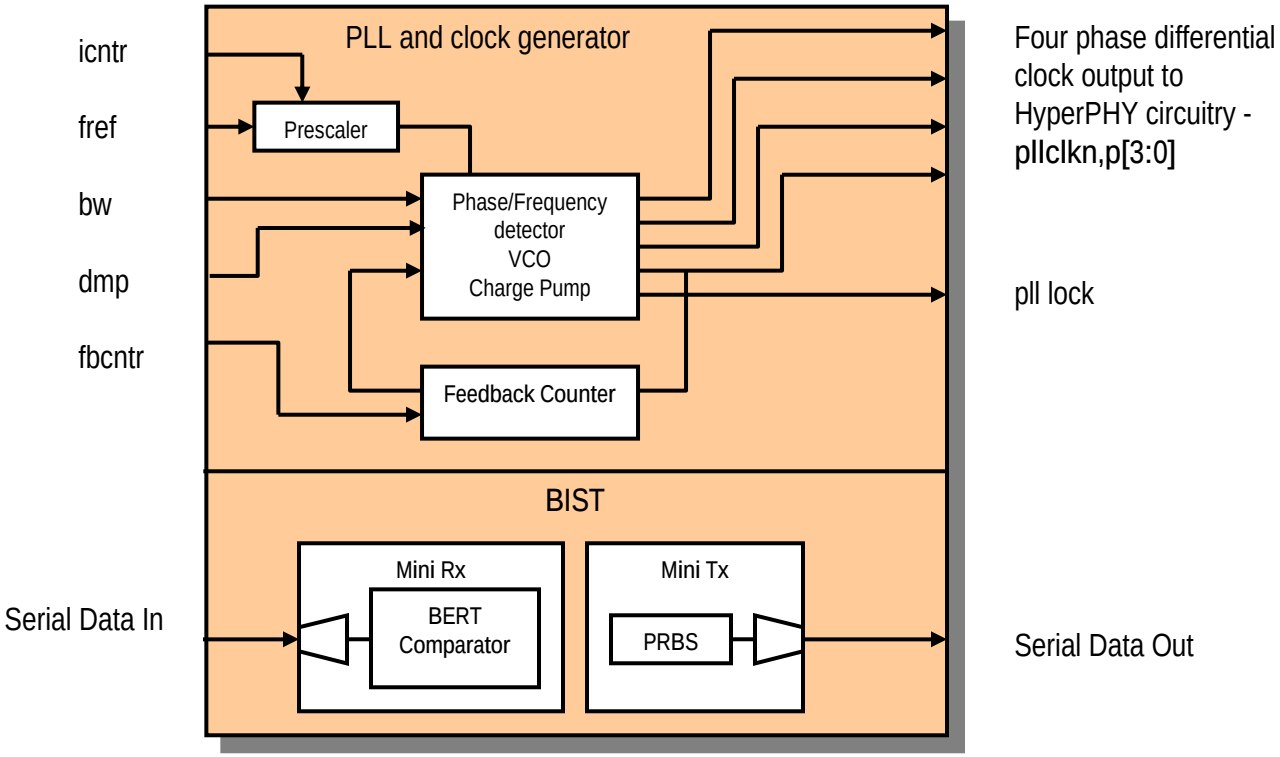
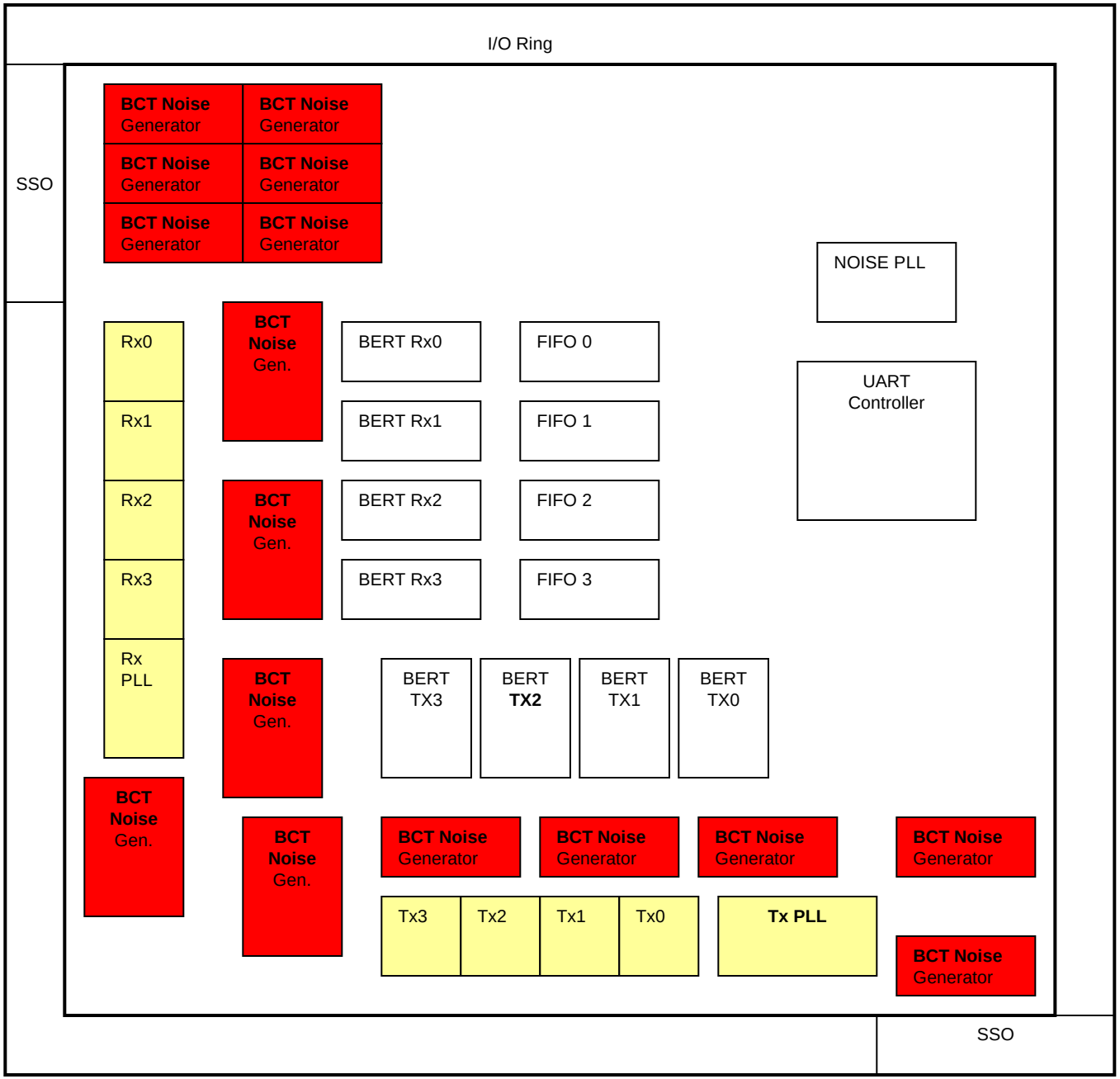


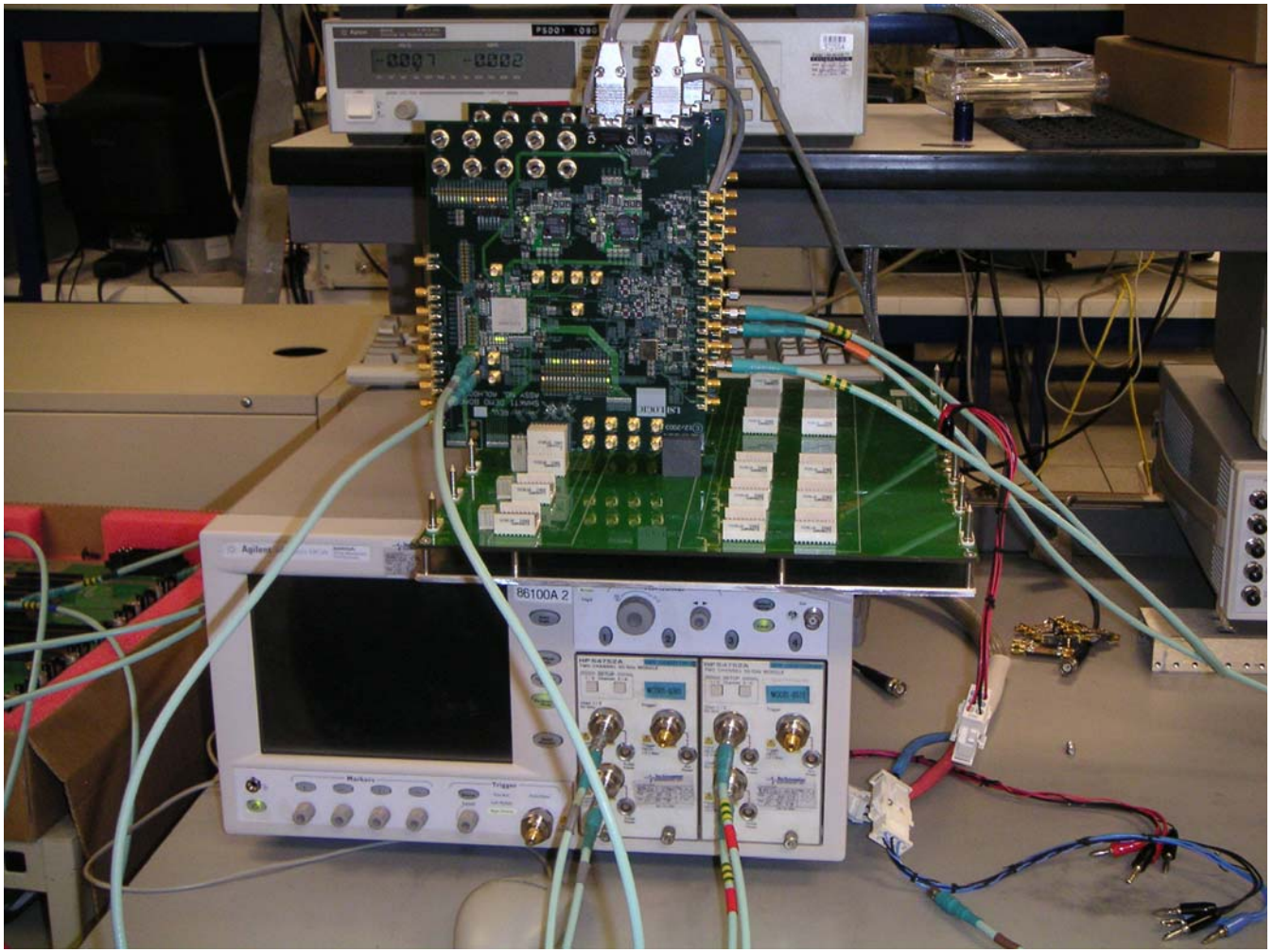
Figure 4: PLL and clock generator signals

Floorplan

(simplified)



Why our parents gave us Legos and TinkerToys to play with…



Why our parents gave us crayons to play with…

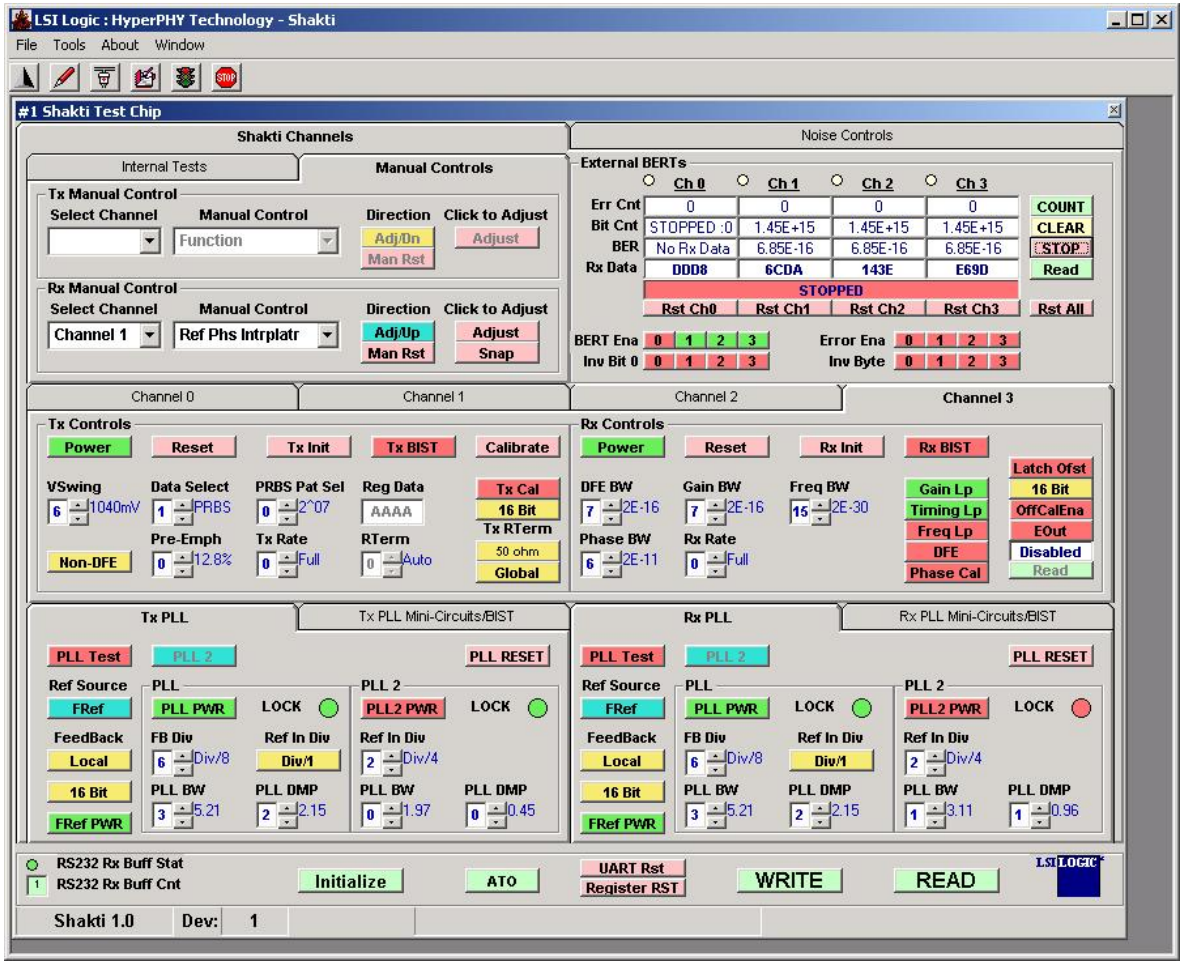
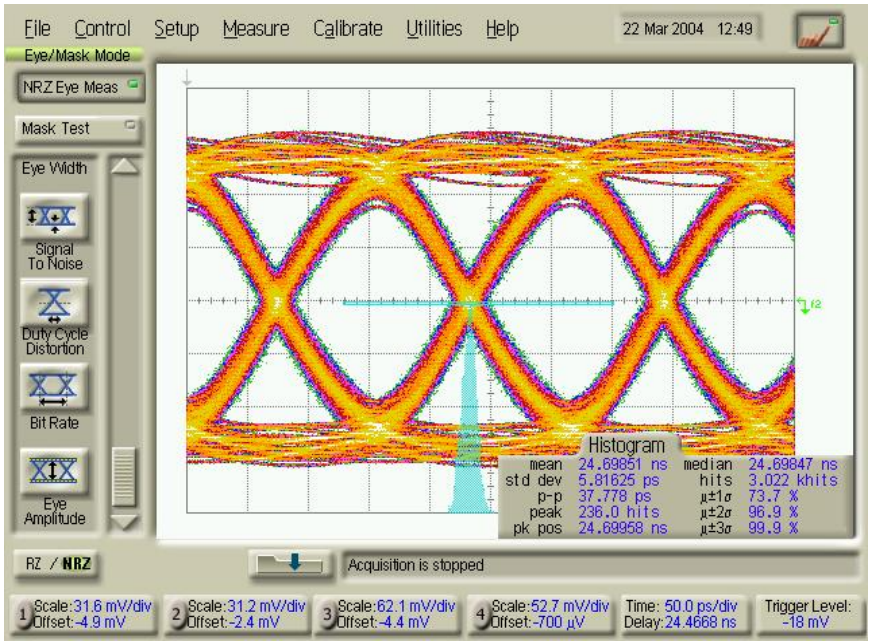


Figure 12 – Screen shot of 6G HyperPHY Graphical User Interface

Data Eyes

- 6.4 Gbps
- 1 V Swing
- 12% PreEmphasis
- Worst case TX jitter:
  45.6 ps peak-to-peak
  (0.29UI) at 6.4Gbps

Near End



- 6.4 Gbps
- 1 V Swing
- 62% PreEmphasis
- After 35 inches of FR4 plus 2 backplane connectors

Far End