A Closer Look at the Startup Issues

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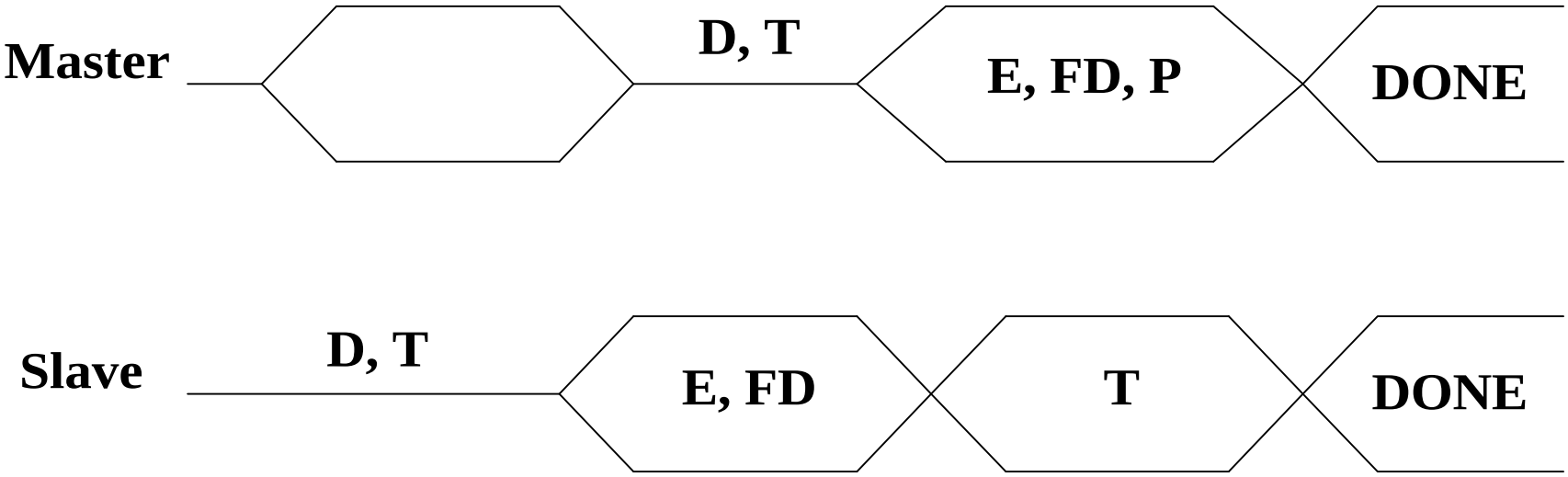
Three Phase Startup



E = Echo/NEXT Canceller Convergence

T = Timing Convergence

P = Adjust Phase

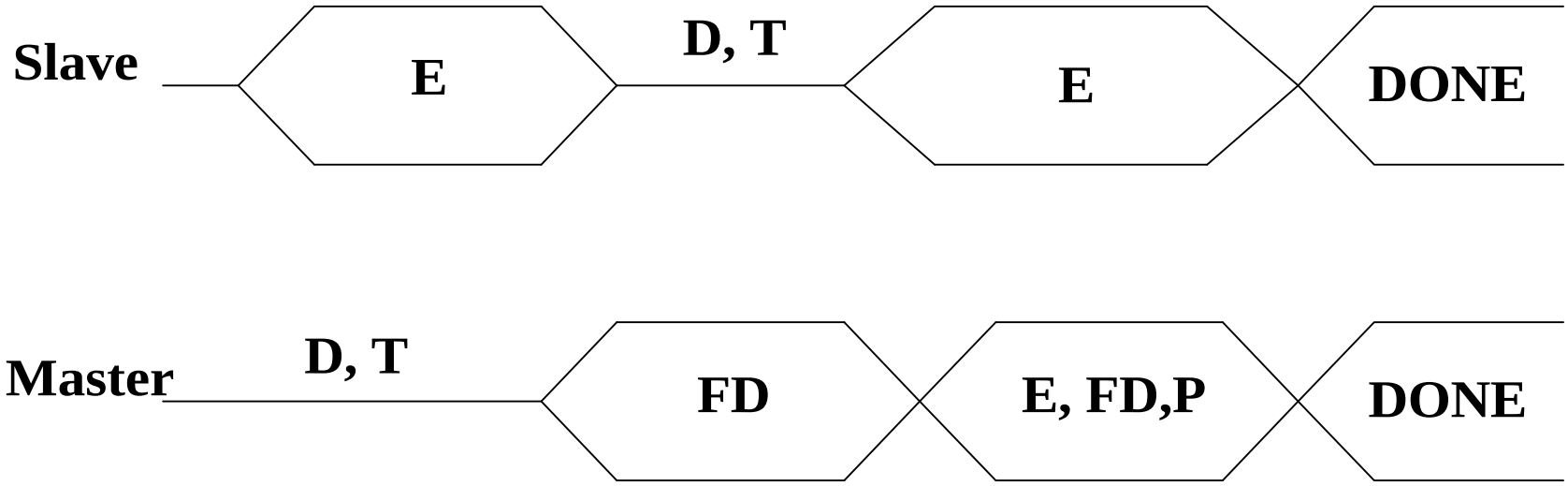
D = Equalizer Convergence

FD = Freeze Equalizer Taps

Disadvantages

- **Requires the Slave to recover timing twice.**
- **Requires the Master to acquire the frequency and the phase.**
- **Does not allow the use of efficient Timing Recovery algorithms i.e. Equalizer Tap Tracking Algorithms for Timing Recovery.**
- **Introduces questions of interoperability.**
- **Unreliability of the Signal Detect variable.**

Master and Slave Reversal



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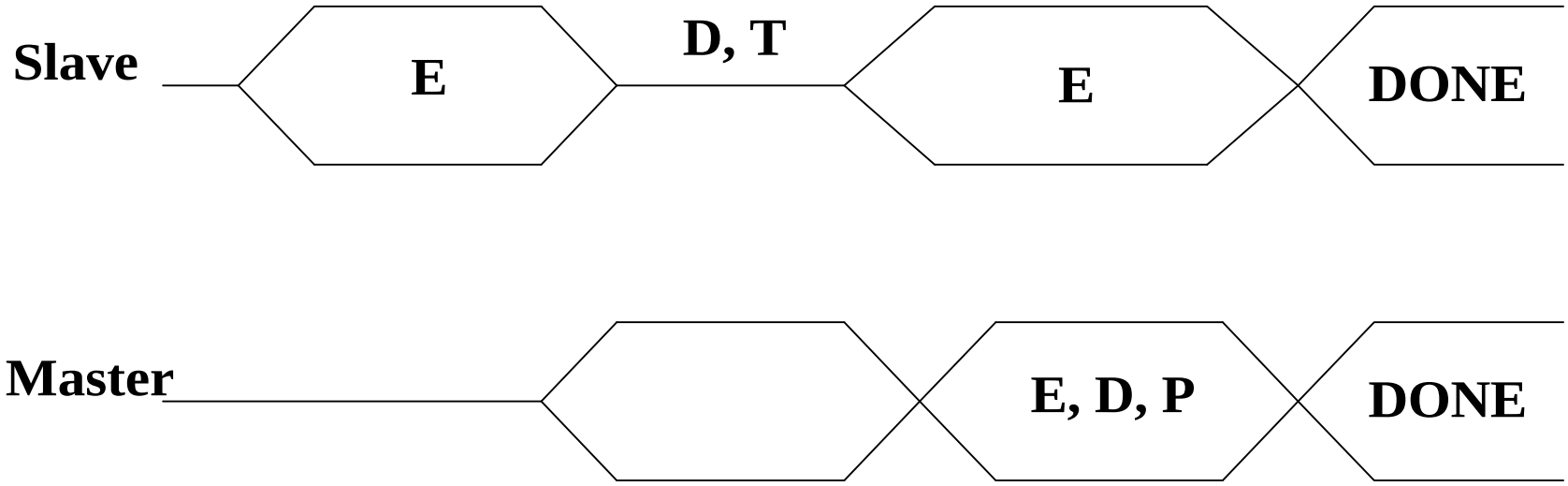
Disadvantages

- **Requires the Master to acquire the frequency and the phase.**
- **Unreliability of the Signal Detect variable.**

Master and Slave Reversal (Cont.)



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Disadvantages

- **Unreliability of the Signal Detect variable.**

All Timer Based Approach

- **Completely eliminates the signal detect problem.**
- **Requires modification of the Autonegotiation timers.**

Some Timer Based Approach

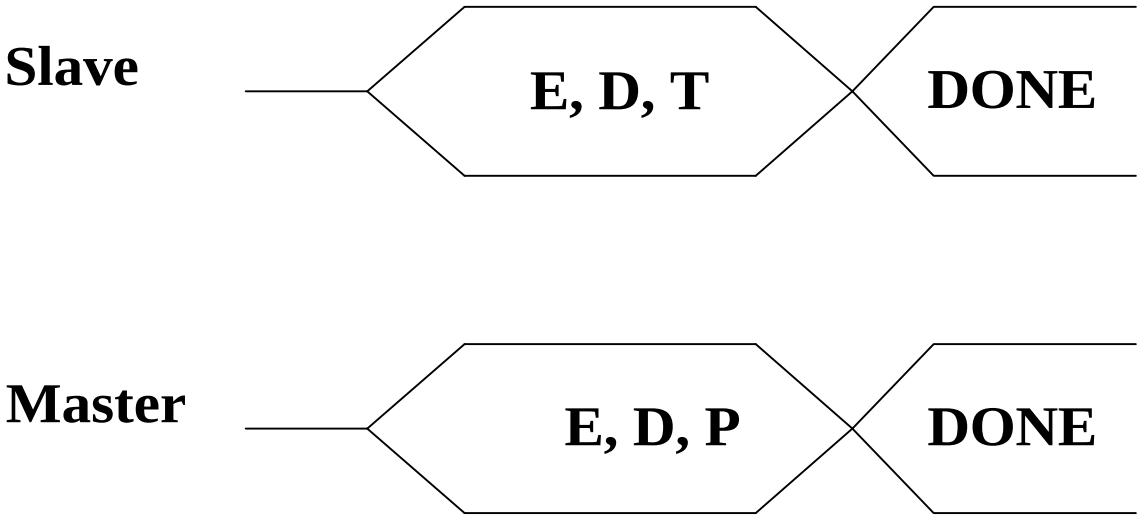
- **Requires at least one signal detect function.**
- **Increases the possible startup times.**
- **Little analysis on the effects of signal_detect=FALSE.**
- **No analysis or understanding of the impulse noise statistics.**
- **No analysis on the effect of autonegotiation link pulses on the probability of false detect.**
- **No analysis for compliance and interoperability testing.**
- **Blind Startup capability is necessary in order to guarantee a reliable and robust transceiver.**

All Approaches

- **In order to have a reliable, robust and competitive solution, it is encouraged and in some cases necessary to incorporate a Blind Startup capability in the transceiver.**

- **If the transceiver has Blind Startup capability, why choose a sequenced startup?**

Blind Startup



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Blind Startup

- **It is already standardized in 802.3y - why reinvent the wheel?**

- **It allows the standard to move forward swiftly to the next stage, with minimal documentation requirements.**

Advantages of Blind Startup

- **(1) Simplicity and reliability of implementation**
- **(2) Eliminates the Signal Detect problem**
- **(3) Eliminates the Dual Phy distinction**
- **(4) Eliminates the forced initial time wastage**
- **(5) Requires a minimum number of states**
- **(6) Ease of interoperability testing**
- **(7) Has a high plagiarization coefficient**
- **(8) It is backward compatible to T2 and TX**
- **(9) Spec write-up is already available**
- **(10) It allows the standard to move forward swiftly**

Conclusions

- **The present three phase startup protocol might not be able to insure a swift forward move in the standard.**

- **A protocol matching a vast majority of our requirements is already standardized in 802.3**

- **Everything considered, the <u>Blind Startup Protocol</u> is the ideal choice for the 1000BASE-T standard.**