

# **PMA Test Patterns and Loopback**

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**IEEE P802.3ba**

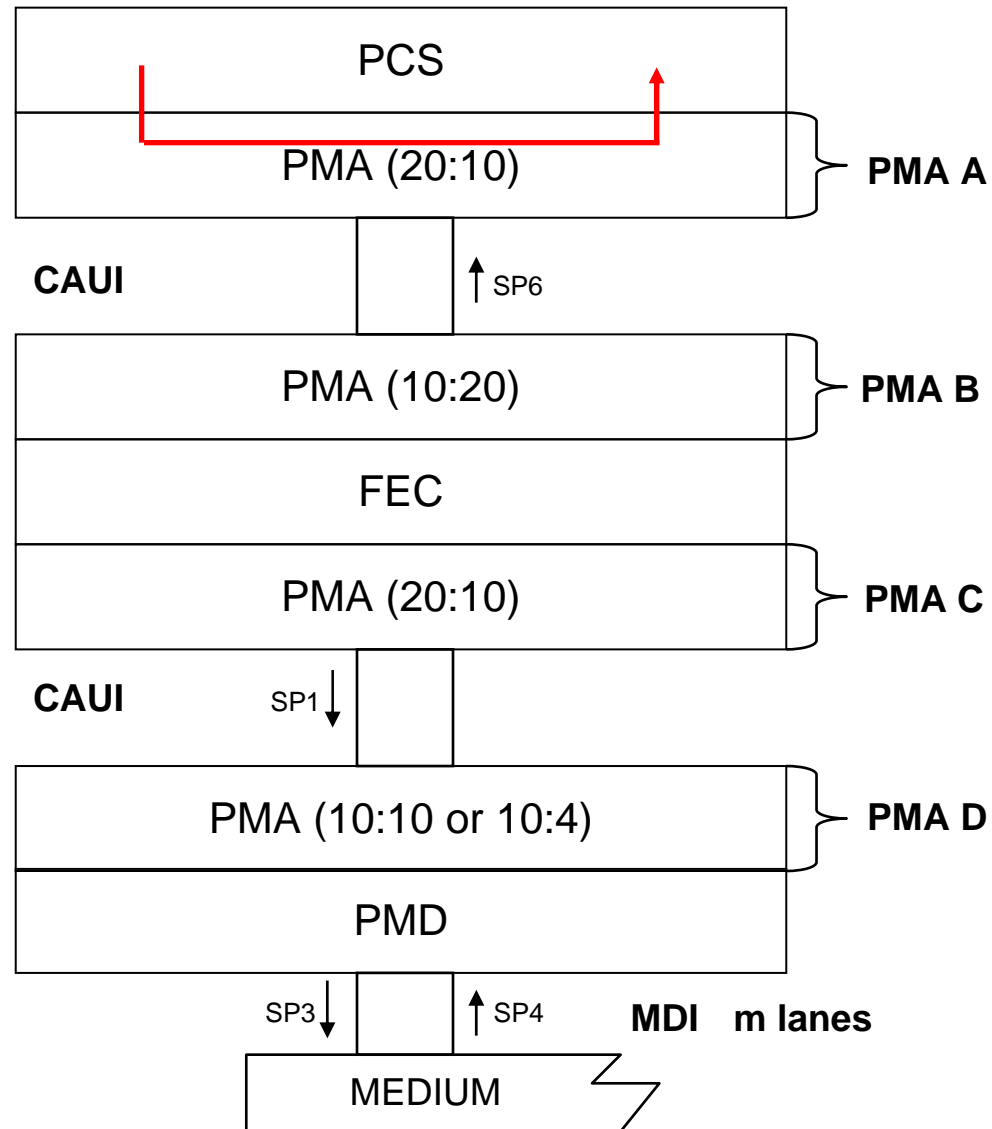
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# Test Pattern and Loopback Issues

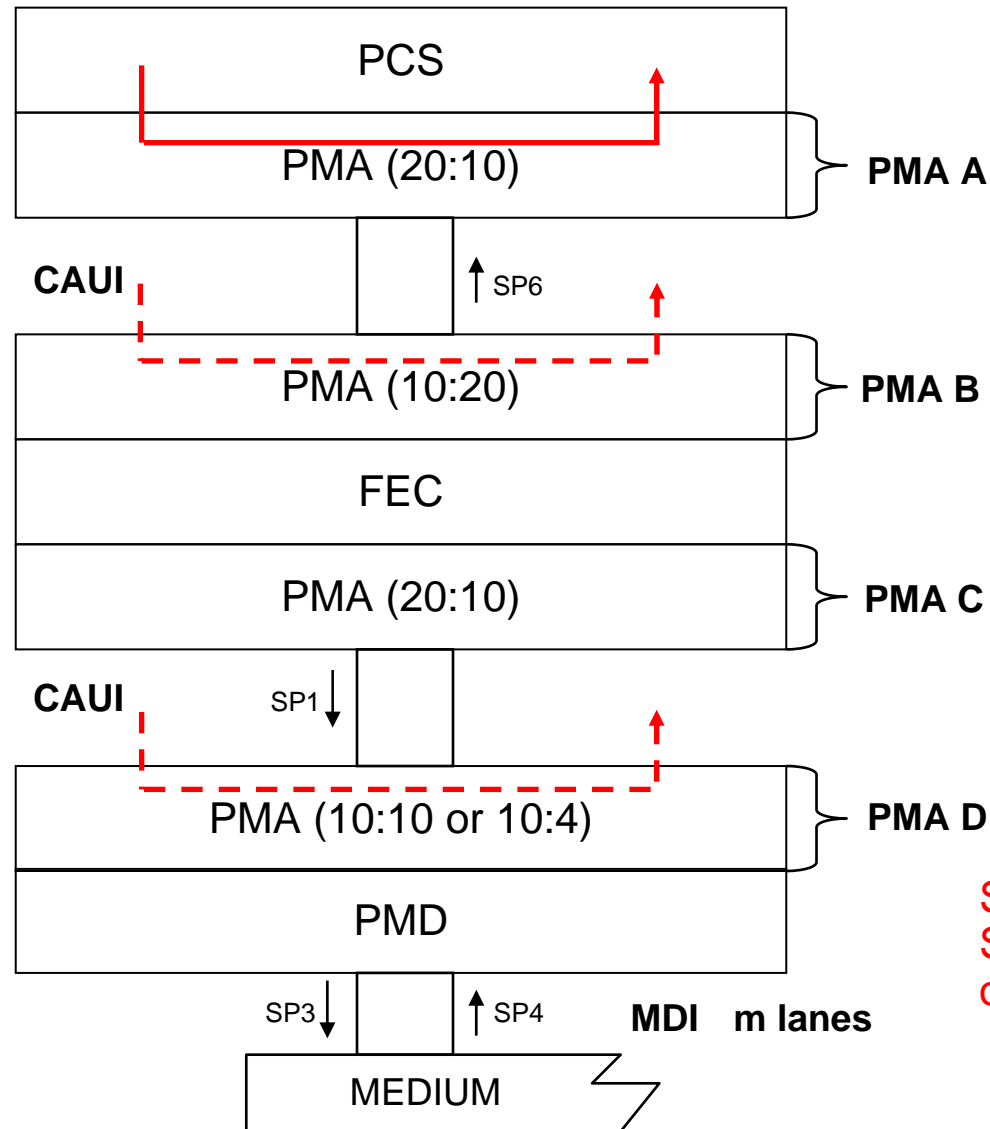
- Decided Issues
  - Short Test Pattern – PRBS9
  - Line Loopback from closest PMA to PMD
- Open Issues
  - System loopback – only from closest PMA to PCS or also below any physically instantiated interface?
  - Test pattern generation and detection
    - Option A (current text, suggested) Generate or detect in Tx or Rx path
    - Option B (alternative) Generate in Tx path, Detect in Rx path, combine with expanded System Loopback
    - What is sent in Tx direction if test pattern detect done in Tx path?
  - Square wave test pattern: per lane or all lanes?
    - Current text of 83.5.9 generates on all lanes
    - Comment 485 resolution and current text of 86.7.5.6 suggests that square wave is generated only on a single lane with PRBS31 or a normal signal on other lanes

# Current System Loopback

## 100GBASE-R Example

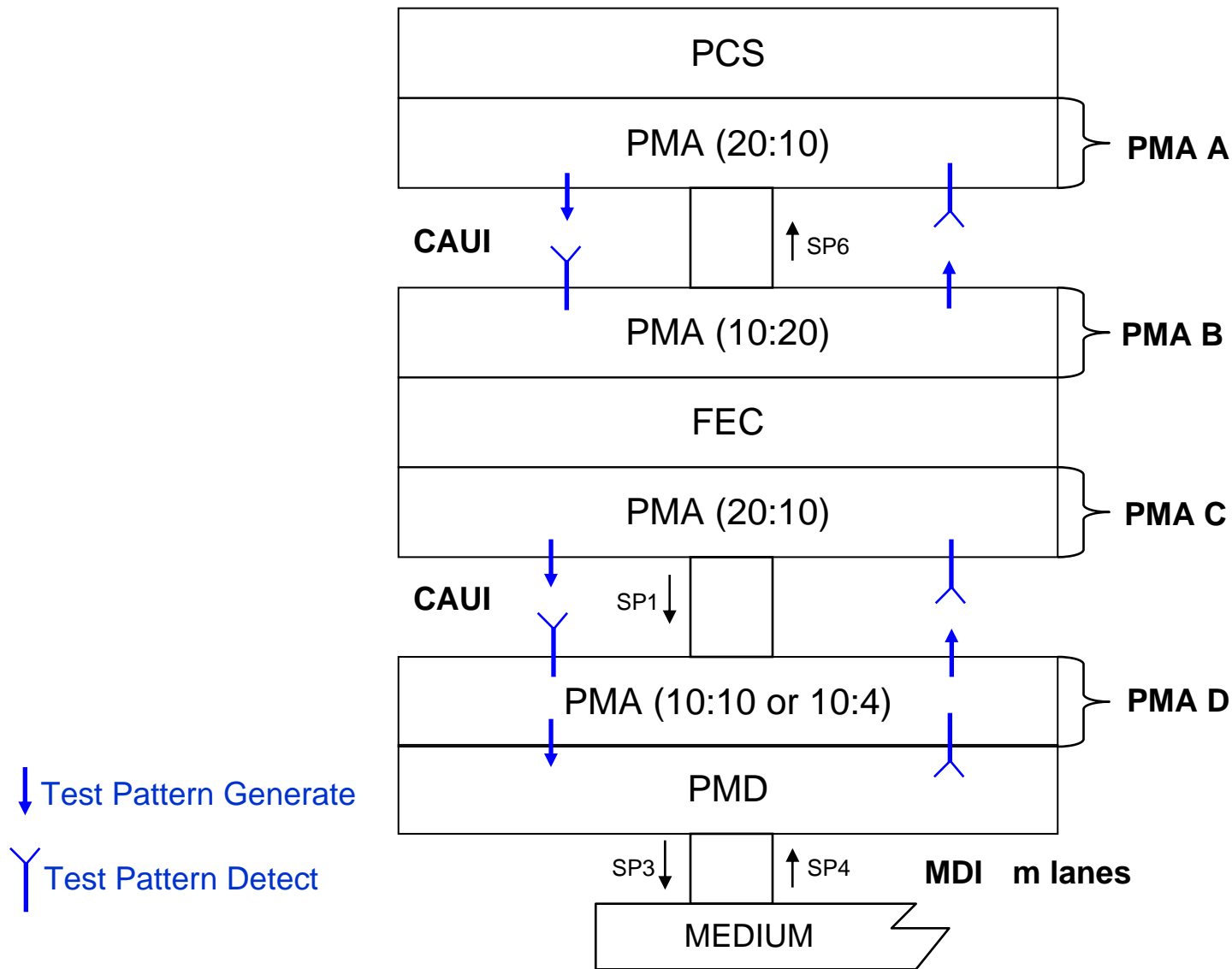


# Possible additional locations for System Loopback 100GBASE-R Example

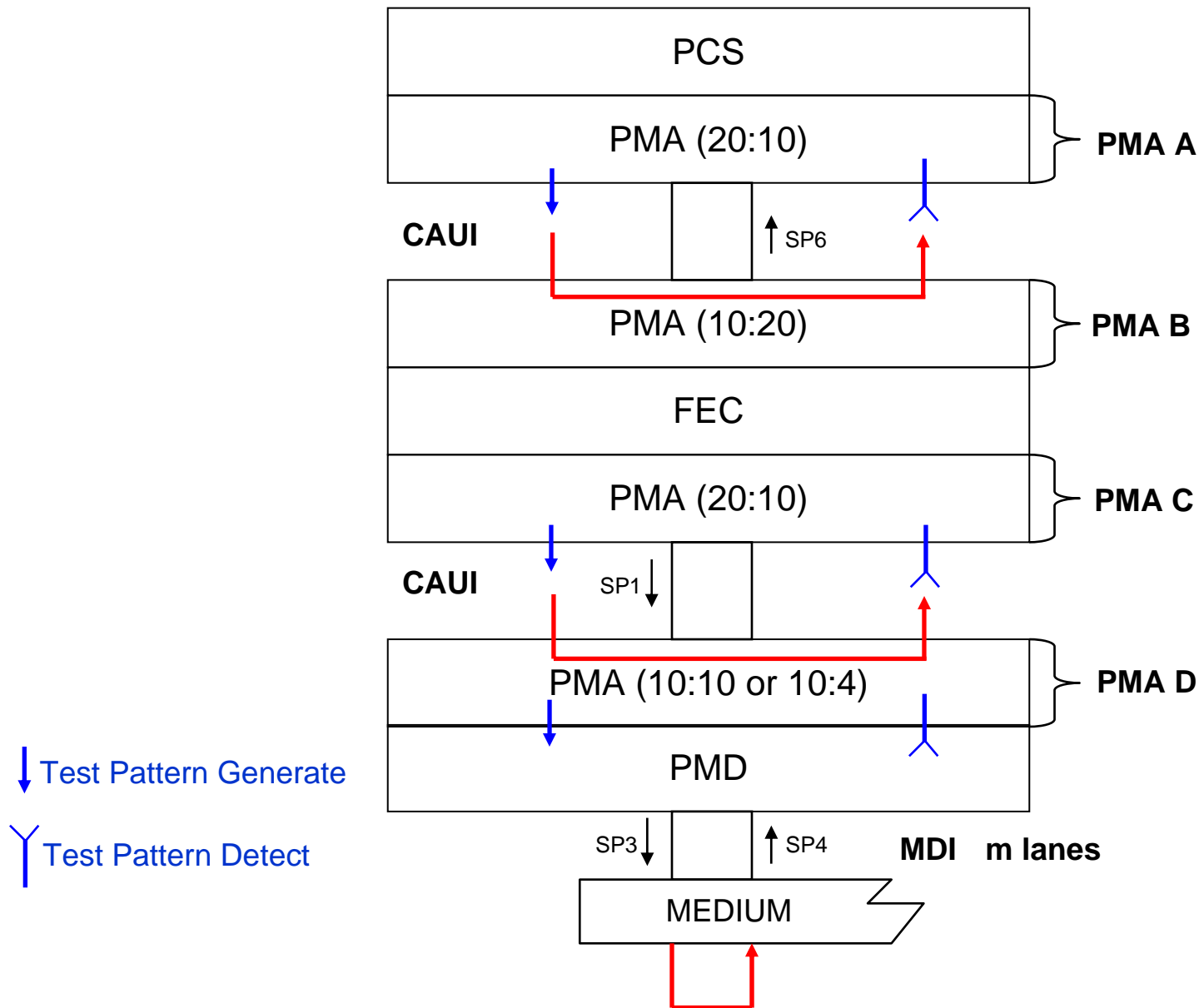


Should additional System Loopback options be specified?

# Current PMA Test Pattern Generation/Detection 100GBASE-R Example



# Possible reduced PMA Test Pattern Generation/Detection 100GBASE-R Example – Needs broader system loopback



Advantages:  
Fewer registers and counters

Disadvantages:  
Reduced fault isolation capability – can't tell whether fault is in Tx or Rx path

# PMA Test Pattern Generation/Detection

## 100GBASE-R Example – what to send during detection?

What should be sent during test pattern detect in Tx path?

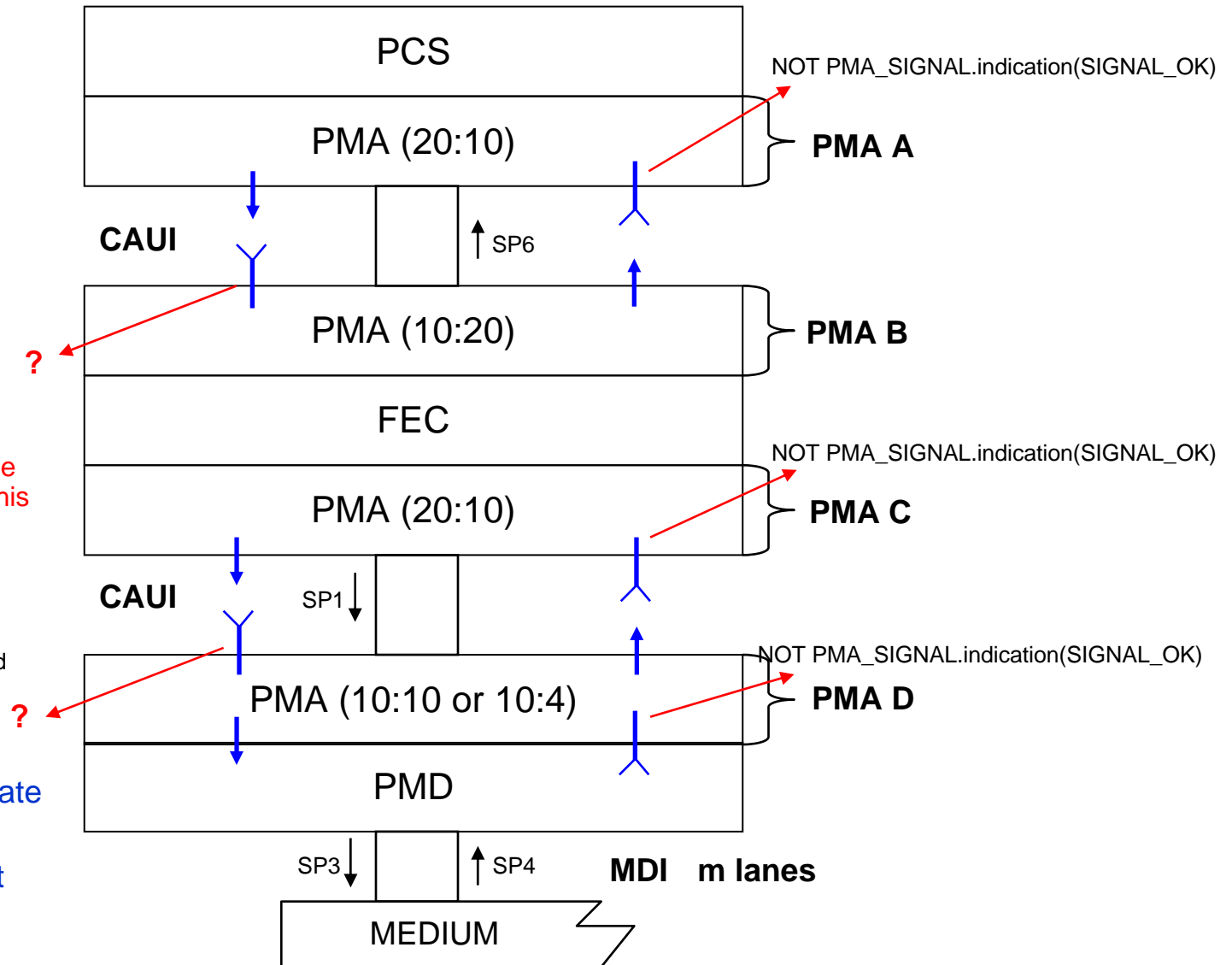
Might generate test pattern in Tx path, except that interface downstream might not be physically instantiated when the interface upstream is.

**Proposal: Just gearbox the test signal, even though this results in garbage sent downstream.**

Note that this is not an issue if the reduced PMA test pattern generation/detection is adopted per slide 6.

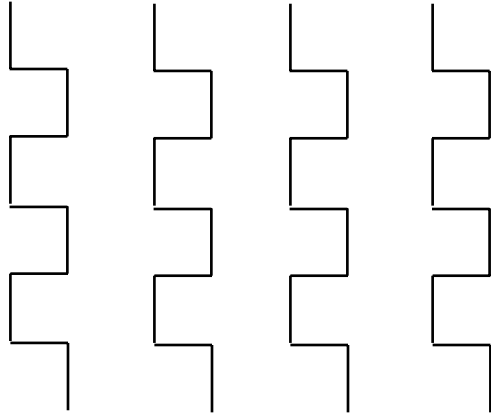
↓ Test Pattern Generate

Y Test Pattern Detect

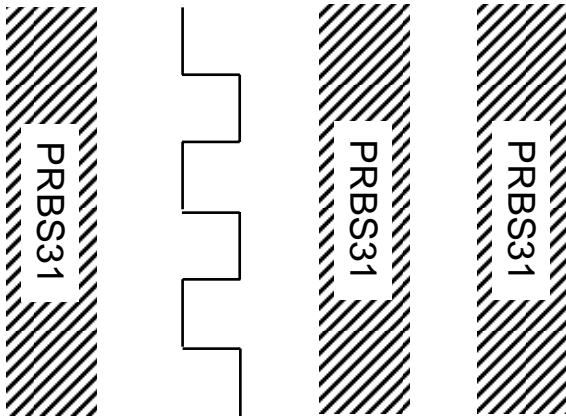


# Test Pattern and Loopback Issues

If done as other test pattern generation  
current clause 83.5.9



Per comment 485 resolution  
current clause 86.7.5.6



- PRBS31 and PRBS9 are done on all lanes – generate and detect
- PCS test pattern (scrambled idles) is on the aggregate – generate and detect
- Square Wave generation only (no built-in detection)
- Should Square Wave generation be per lane per comment 485?
- If Square Wave generated per lane, PRBS31 (or PRBS9) on other lanes makes more sense than a normal signal, which can't be properly received unless sent on all lanes