

Phasing Board PCI Concept

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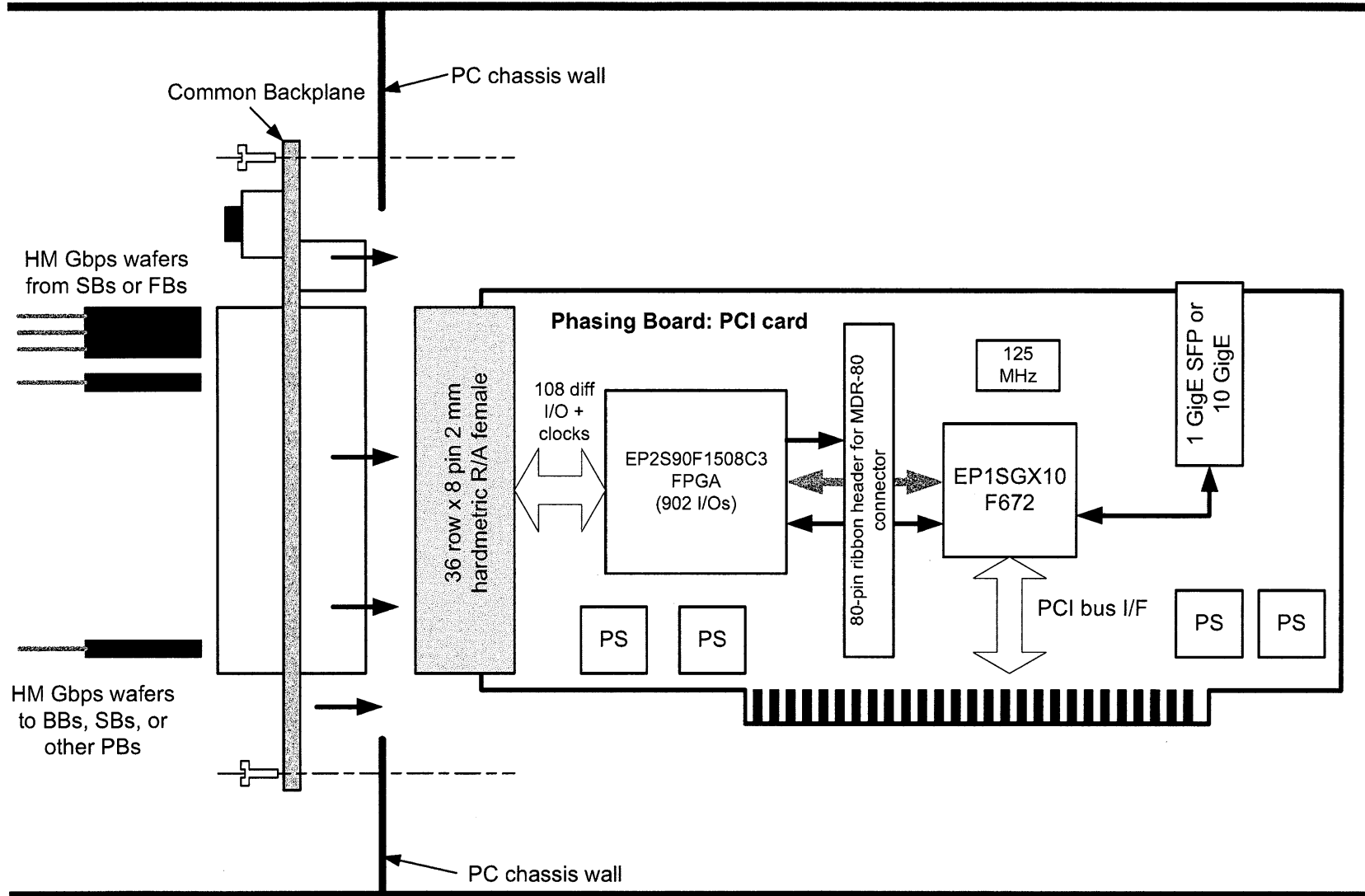


Outline

- Alternative design concept from A25111N0000 DRAFT Nov. 8, 2005.
- Smaller granularity.
- Cheaper PCB design + mfg.
- No hot-swap replacement capability.
- More functionality/flexibility.

Alternative Concept

- Smaller granularity...lots of flexibility.
 - 1 sub-band pair, 32-stations per card...but extensible.
- Cheaper PCB: minimize design + mfg effort.
 - Small PCI card, 2 FPGAs.
 - Faster development time...most development effort on one large FPGA.
 - Use existing Common Backplane to get access to correlator hi-speed signals.
- Assumes hot-swap replacement not necessary.
 - Mounts in COTS rack-mount PC chassis. Could use same chassis as Control Rack CPUs.
 - Could be in same rack as VLBI recorders.



Flexibilities/Possibilities

- Phasing card: phase 32 stations, 1 sub-band pair (256 MHz), produce 4 sub-arrays (8 diff outputs up to 128 MHz each).
 - Only 4 cards required to meet minimum spec.
 - Full phasing flexibility (if fits in targeted FPGA).
 - Capability for MDR-80 output via 80-pin ribbon header.
 - Capability for GigE or 10 GigE output (optional).
- Sub-band filter card:
 - Phased output of previous card into this card to produce narrower phased sub-bands.
 - FPGA programmed for filtering, not phasing operation.
 - MDR-80 and/or 10 GigE output.

Flexibilities/Possibilities

- >32-station phasing card:
 - Outputs from >1 phasing card feed into this card to increase #ants phased...could used modified HM Gbps protocol for more bits.
 - Possibly different FPGA personality.
- Synchronization card:
 - Multiple Phasing card (modified) HM Gbps outputs feed into this card to synchronize all to one time reference.
 - Different FPGA personality.

Flexibilities/Possibilities

- Switch card:
 - Allow selection of one or more of multiple inputs to feed to downstream Phasing cards...allows more flexibility in selecting which sub-bands are to be phased...just requires the cable...
 - Different FPGA personality.
- VSI-H/MDR-80 input access card.
 - VSI-H/MDR-80 input data converted to correlator HM Gbps high-speed format
 - OR NOT...allows connection to Station Board VSI hardmetric inputs.
 - Different FPGA personality.

Flexibilities/Possibilities

- Other possibilities?
 - “Pulsar backend stuff”?
 - Phased data capture...s/w phased data processing.

Summary

- Cheaper and faster PCB development and mfg.
- Design effort concentrated in FPGA...Phasing FPGA design must be done first to ensure concept is viable.
- Multiple uses...multiple FPGA personalities...the fun is never ending!
- Use PCI chassis with slight modifications.
- **No hot-swap capability.**