MWA 2009 Seattle
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Status - June 09

- ¾ of 32T in field & working (!)
- Final packaging design advanced
- Production version designs underway
- No major show-stoppers so far… 😊
- …but we haven’t turned on the Walsh, either!
Environmental Enclosure

Poseidon Systems, Inc (Fremantle)

- Packaging
- Cooling
- Connections
- Maintainability
- Production cost
Enclosure Prototype

- PSI working with several sheet metal companies on fabrication of the enclosure.
- Quoted prices vary greatly…
- First physical prototype – not electronically functional – end of July (?)
- -> finalize the internal design
- completion of Phase 3 (full proto) in August.
Subsystem revs for production

- PCB revisions
  - ASC – new band-limiting filter design
  - ATIM – fixes, reconfigure for new enclosure
  - ATIF – rev/fixes (SSR, parts)
  - Power supply & distribution board

- Wiring/cabling
  - Proper harness system

- Mechanical fixing
ATIM

- Functional fixes based on field experience
- Split into 2 boards to fit new packaging
  - ATT (connector transition)
  - ATIM_v2 (logic)
- Support either old (ATIF) or new (DOC) beamformer connection
- Fixes 48v control issues
- Designs (logic + PCBs) in progress w/PSI
New Single Board Computer

- Current board out of manufacture (EOL)
- List of alternatives developed w/ PSI
- 2 candidates purchased (EHM, Boston) for evaluation
- Selection of vendor needed ASAP (end of June?)
ASC - New Bandpass filter

- New filter designed
- Test PCBs for new filters are being fabricated
- When testing is complete, integrate with existing PCB
- => ASC board will be considered complete (ready for production).
ASC RF preamps
Existing filter aliases power into passband...

Briggs, 2009
Candidate lumped-element filters

Simple cascade

PSI compact design
BF control interface

- ATIF/BTIF (existing serial interface)
  - Modifications to protocol (cpld code)
  - Remove LC filters, add termination resistors

- DOC (Data over Coax)
  - Combined data + RF + power design
  - Prototype working at Haystack 6/15
  - Plan to build 1 receiver’s HW, retro-fit after 32T demo

- both functional
Fiber clock & distribution system

- Design & prototype under development at Finish Line Engineering (Boston)
- Design review last week, passed.
- Roger to report further
Clock System Diagram

“Outside”

“Central Hut”

RF Synth

GPS

Clock Gen

“RTM” (Fiber TxRx)

Correlator + data capture

Ethernet

Fsample: 655.55..MHz

10MHz Ref

1pps

Clk+sync

4pr fibers +AC pwr

Data

x16

x8

x16

x8

x4 Nodes (...60)
Clock Broadcast: … using Finisar Transceivers on RTM

Node 1 → clock
Node 1 → ?
Node 1 → ?
Node 2 → Optical Fibres
Node 2 → Tx/Rx
Node 2 → Tx/Rx
Node 3 → Tx/Rx
Node 3 → Tx/Rx
... → Tx/Rx
Node 64 → Tx/Rx

R. T. M.

M&C Computer

GPS Station Clock

Synthesizer

10 MHz

1 PPS

Control (SCTN)

F_s

F_s + SCTN

Sampling Clock Encode Module
Other ideas (features)

- Subsystem self-ID?
- Self-test
- Command/parameter read-back
- Walsh switching...
M&C Integration

- Now have working core (EHM++)
  - Timing/triggers/synchronization
  - Status reporting/readback
  - State diagram revisions

- Tests needed – power-on and diagnostic
Test & maintenance

- “quick-look” diagnostics needed
- Built-in self-test on startup?
- “short” vs “long” tests for maintenance
- Need suite of qualification measurements/observations
- Need dedicated engineering mode
  can’t “use the observing interface”
Lab integration

- Curtin setup invaluable!
  - Test & repair
  - Integration checkout
  - Software & systems development

- Systems configuration & setup...

- Demonstrates need/value of ‘engineering overbuild’ – not just spares -