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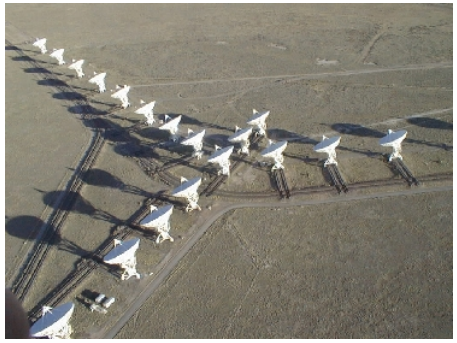

Expanded Very Large Array

Data Examination and Checking Programs--Requirements

B. Carlson

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Outline

- Overview of data products.
- H/W validation.
- H/W verification.
- In-system checkout/operational verification.

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Overview of Data Products

- Station Board:
  - Wideband state counts, autocorr coeffs.
  - Sub-band filters:
    - clip counts
    - pre-requantizer power measurements
    - re-quantizer state counts/power measure
    - re-quantizer clip counter
    - tone extractor coeffs
    - RFI blanker
    - Radar mode data capture.
  - Comm path/H/W error detectors.

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Overview of Data Products

- Baseline Board:
  - Correlation coefficients (lags) to CBE.
  - Phased output (to VLBI recorders)
    - Data quality measurements along the phasing signal path.
  - Comm path/H/W error detectors.

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H/W Validation

- Occurs during prototype test/debug phase.
- Stimulate H/W with testvectors.
- Ensures that design/DSP is sound, producing correct data.
- Need visualization/analysis/comparison tools.
  - Ideally compare with “known” results.
  - In some cases, may not know “exact” results…need to do statistical/first principle analysis.

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H/W Validation

- Visualization/checking tools.
- RTDD (Real Time Data Display)
  - Ready for Station Board.
  - Some work required to look at Baseline Board output.
- "lagfan" and "lagcomp" C programs for corr chip testing are useful and reasonably powerful for now.
- What about phased output?
  - Need to handle/display data products as defined in RXP RFS.
  - Also need to have packet capture/compare capability…part of intelligent diff? RTDD?
- And, of course, image processing S/W for PTC tests.

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H/W Verification

- Once H/W is validated, build final test bed configurations, and develop a test suite for each one.
  - With the X-bar Board in “testmode”, can build a separate and independent test bed for each board type. E.g. Baseline Boards can be verified independent of Station Boards and vice-versa.
- Each test within a test suite is one configuration, run for a set period of time, with a repeatable set of output data products.
- Number of tests in suite, duration of each test, configuration for each test not pre-defined…need to use experience, to get maximum coverage for reasonable execution time.

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H/W Verification

- A test suite produces a number of output files.
- Each board is run thru the same test suite, and run “intelligent diff” to compare data products with existing “golden files” for pass/fail indication.
- This is the primary (but not only) purpose of the Test Executor/intelligent diff.

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In-System Checkout/Verification

- Once partial or full installation at site, need to develop test suite/methods to initially and then periodically check hardware.
  - Most hardware has built-in on-line and off-line connectivity checking that is built into normal hardware/software processing.
  - But still need to check data products for on-chip failures.
- Likely board-to-board comparison is easiest way.
- And/Or can generate test vectors at various points and compare with golden files as well.
- Needs further definition of exactly what to do.