



Molonglo Radio Observatory is transforming into SKAMP (SKA Pathfinder).
Courtesy Molonglo Observatory.

SKA PATHFINDER

SKAMP designated official SKA Pathfinder status.

In early August the SKA Science and Engineering Committee (SSEC) designated SKAMP as an approved SKA Pathfinder. The SSEC is the sole arbiter for designating national, regional and institutional contributions to the SKA as Precursor, Pathfinder, or Design Study.

Following a proposal submission by Anne Green, SKAMP Project Leader, the SSEC determined that SKAMP's contribution satisfied the Pathfinder criteria within the areas of technology, science and operations.

SKA Pathfinder: SKA-related technology, science & operations activity. For more information on SKA designations, visit www.skatelescope.org.

DIGITAL SYSTEMS POST-PRODUCTION & INTEGRATION

All SKAMP digital system boards now delivered by Puzzle Precision and undergoing acceptance testing.

RTM Boards

SKAMP has recently received the manufactured Optical & Correlator Interface modules from CSIRO, also referred to as Rear Transition Modules (RTMs). All interface modules have been tested for power and signal integrity, with an impressive 100% yield.

A mechanical design fault causing connectivity problems between the RTMs and main boards was identified by the team at Molonglo. Charles Hemmings and Duncan Campbell-Wilson resolved this by designing and machining a spacer which is inserted between the RTM, the panel and the card cage ejectors. A prototype of the spacer has been tested successfully and plans are in place to replicate it for all boards.

PFB Boards

The PFB boards for the SKAMP & MWA projects have been delivered to CSIRO by Puzzle Precision. They have been tested for power and programmability with a high yield. Ron Koenig (CSIRO) discovered that a problem capacitor was short circuiting the power and ground pins on one board, which has now been resolved and all boards tested successfully.

Correlator Boards

The Correlator boards for SKAMP & MWA projects have also been delivered to CSIRO by Puzzle Precision. There were some missing resistors, critical for the JTAG (Joint Test Action Group) connectivity to carry out programming of the FPGA, but they have now been mounted and the boards are currently being tested for power and programmability.



SKAMP Screened Room. Courtesy Molonglo Observatory.

FRONT END

Screened Room

The screened room, which will initially be used for testing SKAMP system components, is near completion. The internal mains wiring is now complete to the internal sub-mains board. It is anticipated that the room will be operational by the end of August 2010 in time to test the manufactured receiver boards.

Front Panels

The aluminium front panels for the PFB and Correlator Boards have been manufactured and delivered by Metal Storm. Theo Honing-Wassenberg spent many hours highlighting over 100 etched boards before they were fitted onto the corresponding printed circuit boards.

Network

The SKAMP network has been reviewed to incorporate the connectivity of the data pipeline computers with the correlators and the external world. Two 48-port Gigabit Ethernet Allied Telesys switches have been installed and configured to meet the design requirements. The need for two 16-port Gigabit ethernet switches has been established to help isolate the correlator data traffic, the control traffic and the external world traffic from each other. A byte level problem in data transfers between the correlator output and the ethernet switches has been diagnosed and resolved.

Cabling

A cable tray has now been installed to carry the 24 Infiniband cables between the two PFB and Correlator chassis. 52 CAT-6E cables have also been connected up to the switches ready for the Correlator boards.

STAFF ANNOUNCEMENTS

Lindsay Harkness joined the Molonglo team in July as an Electronics Assistant to build the SKAMP receivers and prepare them for full production.

Previously, he has held positions of senior systems engineer and senior design engineer, working across a broad range of communications, electronic, remote sensing and optical engineering projects both nationally and internationally.

Theo Honing-Wassenberg recently left the SKAMP team to join the Australian Navy. Theo has been a Technical Assistant at the Molonglo Observatory since September 2008. His contributions to the project during this time have been considerable and we would like to wish him well on his new adventure.

DIGITAL SYSTEM UPDATE

Sky signal passed from the antenna through to correlator input.

Receiver

The Receiver has been installed in the field and has been tested for electrical and network connectivity. The link to the PFB is currently being tested for reliability using Bit-Error Rate Tests (BERTs). Success - a sky signal has been passed from the antenna through the Receiver, PFB and to the input of the correlator.

PFB

The SKAMP PFB firmware is nearing completion with the final piece, the Output Corner Turner (OCT) currently being tested.

Correlator

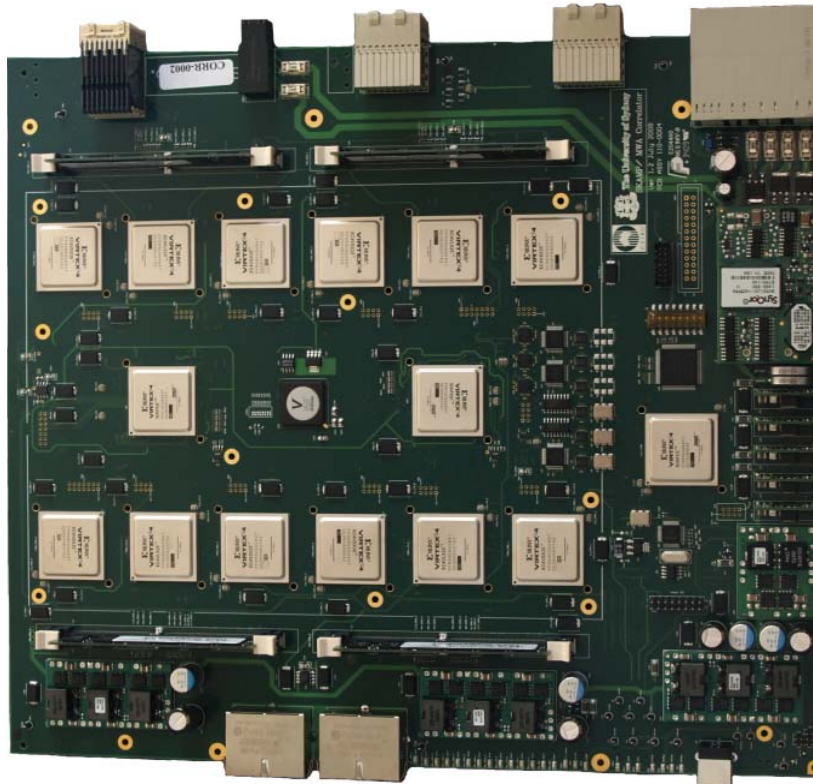
Darshan Thakkar and Ludi de Souza are making great progress with the SKAMP Correlator firmware development. A single-cell and its control system has been verified to work in silicon. The system was instantiated in the Route/Sum (R/S) FPGA and driven by a data generating module. Future development: augmenting the PFB interface to the design & shifting the data generating module across to the PFB & repeat the tests. This will be followed by scaling to a 16-cell system in both R/S chips. Finally, the Gigabit Ethernet interface will be used to send the data from the correlator board to the Data Pipeline Computer.



Downconverter & FPGA receiver board for SKAMP. Courtesy Molonglo Observatory.



Duncan Campell-Wilson (R) & Ludi de Souza during the early days of testing in the screened room ('09). Courtesy Molonglo Observatory.



Correlator Board designed by CSIRO for the SKAMP Digital System. Courtesy Molonglo Radio Observatory

SKAMP & MWA DIGITAL SYSTEMS HANDOVER

The School of Physics and CSIRO will be celebrating the official handover of the Digital Systems in September 2010.

The delivery of the digital system will signify the achievement of a major milestone in the SKAMP project. To mark this occasion, the School of Physics and CSIRO will be hosting a celebration at the University of Sydney on the 10th September 2010 at 10am.

The development of the digital system has been a joint collaboration between CSIRO and the University of Sydney, and CSIRO was commissioned to build the digital systems for both the SKAMP (SKA Pathfinder) and MWA (SKA Precursor) projects.

David DeBoer, CSIRO Project Director for ASKAP will be officially handing over the completed digital system for SKAMP to Anne Green, Project Leader SKAMP and the 128T digital system for MWA to Wayne Arcus, Project Manager MWA.

For more information about this event, please contact Debra Gooley, debra.gooley@sydney.edu.au

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SKAMP Newsletter

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