



THE SKAMP PROJECT

SQUARE KILOMETRE ARRAY MOLONGLO PROTOTYPE



Introduction

The School of Physics within the University of Sydney owns and operates the Molonglo Observatory Synthesis Telescope (MOST), a cylindrical parabolic array used for radio astronomical research, located near Canberra, Australia. Its 18,000 m² collecting area is the largest of any radio telescope in the Southern Hemisphere.

The telescope was recently awarded funding to prototype technologies relevant to the next generation radio telescope, the Square Kilometre Array (SKA). This involves major upgrades to the telescope's data collection and processing systems. Upgrades include new wide-band feeds, low-noise amplifiers, digital filterbanks and an FX correlator, all of which are to be custom built for the array.

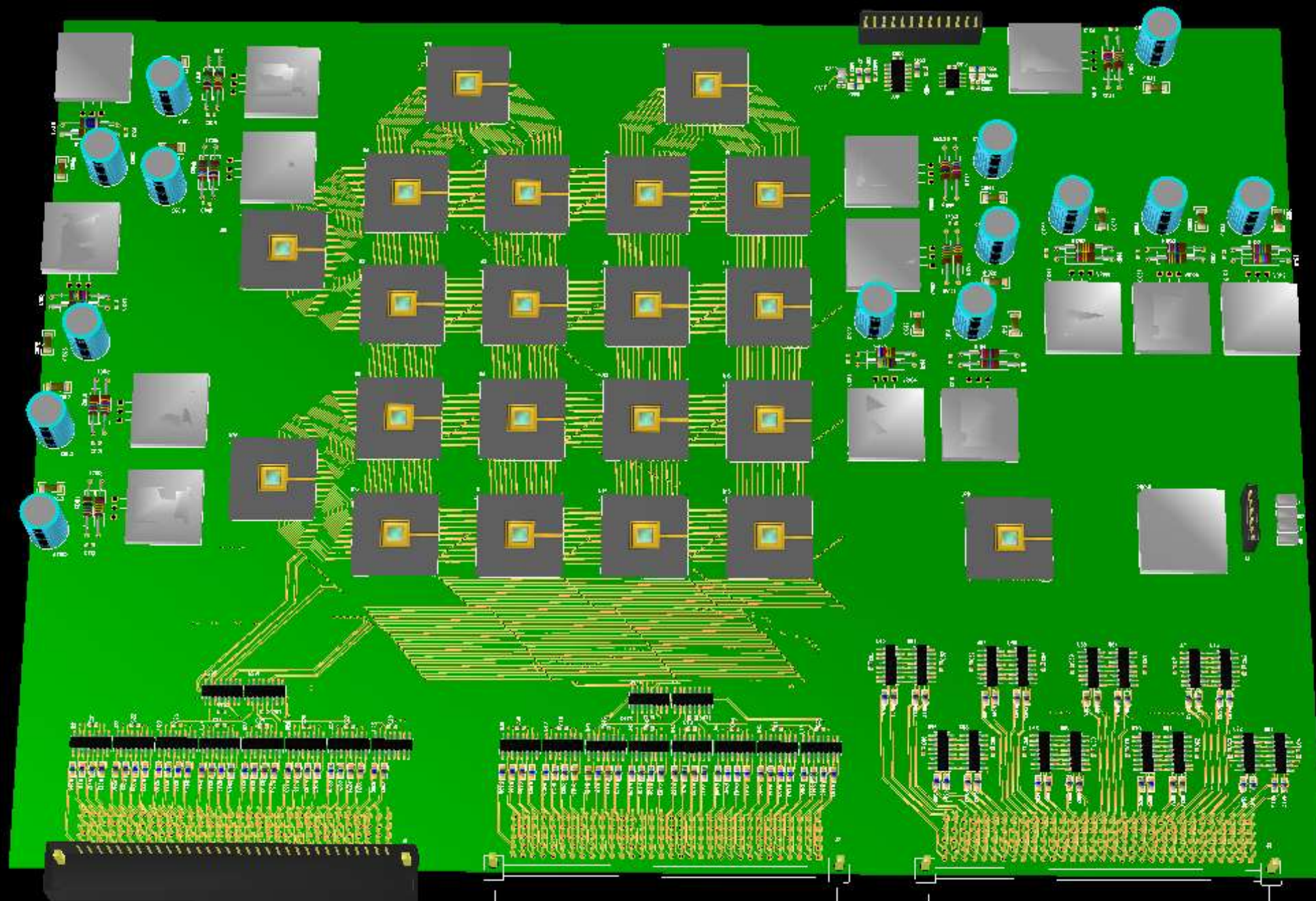
For more information on the SKAMP project:

<http://www.physics.usyd.edu.au/astrop/ska/>

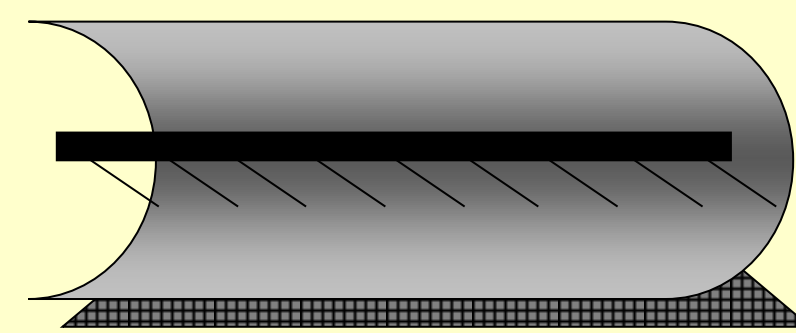
For more information on the SKA:

<http://www.skatelescope.org/>

The SKAMP Correlator

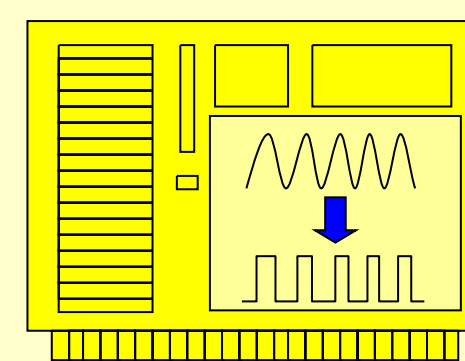
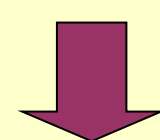


How it works



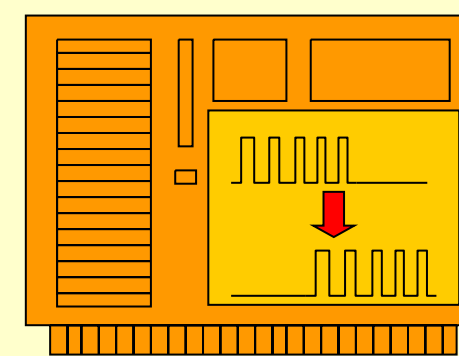
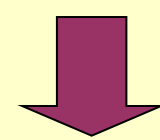
Cylindrical Parabolic Antennas & Amplifiers

Collect and amplify the astronomical signals



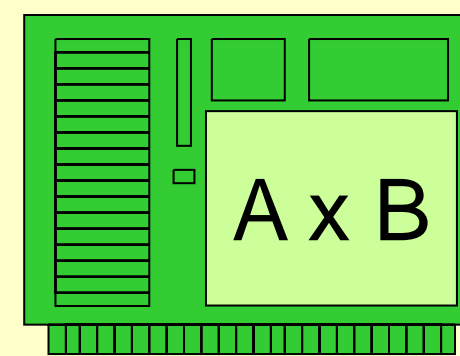
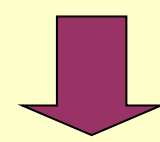
Analog to Digital Converters

Turns the analog signals into digital signals



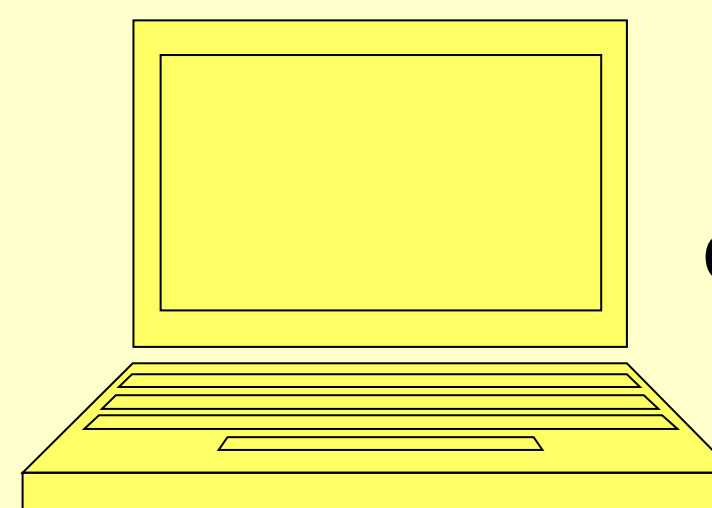
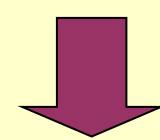
Digital Delay & Phase Tracking

Electronic steering of telescope beams



Correlator

Compares the digital signals against each other in order to find real radio sources



Signal Processing & Storage

Creates images and stores data for scientific analysis

The Project

The SKAMP upgrade uses smart design techniques to enable the telescope redevelopment to be undertaken while still allowing parallel operation of the existing imaging observations. The upgrade is being performed in stages with stage 1 simply demonstrating the technology, and stage 2 & 3 enhancing the telescopes ability by increasing its centre frequency from 843MHz (current) to cover the range 300MHz – 1.4GHz. This increased frequency range allows us to achieve the SKAMP science goals, including:

- A census of the low frequency radio sky
- Search for distant galaxies using red shifted neutral hydrogen gas
- Study of the structure of our Galaxy at low frequency

Molonglo Observatory Synthesis Telescope



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