Collecting and Creating Digital Assets for the SKA Radio Telescope Project, Boolardy

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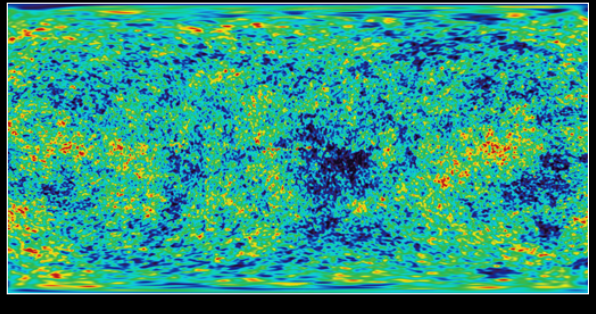
Photography: Peter Morse

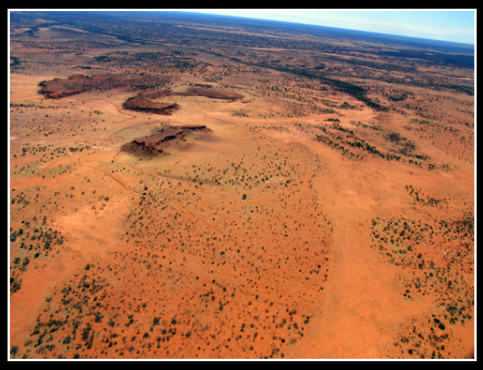
A joint WASP / Communication Studies / Physics project of the University of Western Australia

Outline

- Goal is to acquire digital assets related to the SKA project.
- Assist in
  - planning exercise (array location and orientation)
  - promotion to government and other funding bodies
  - creating content for public outreach
- Initially involved a helicopter trip from Perth to Boolardy to start a photographic database. (Peter Morse)
- Propose engaging ways of creating and presenting any derived content.
  - high resolution displays
  - stereoscopic
  - immersive dome
  - PodCast: iPod/iPhone and other PDAs.



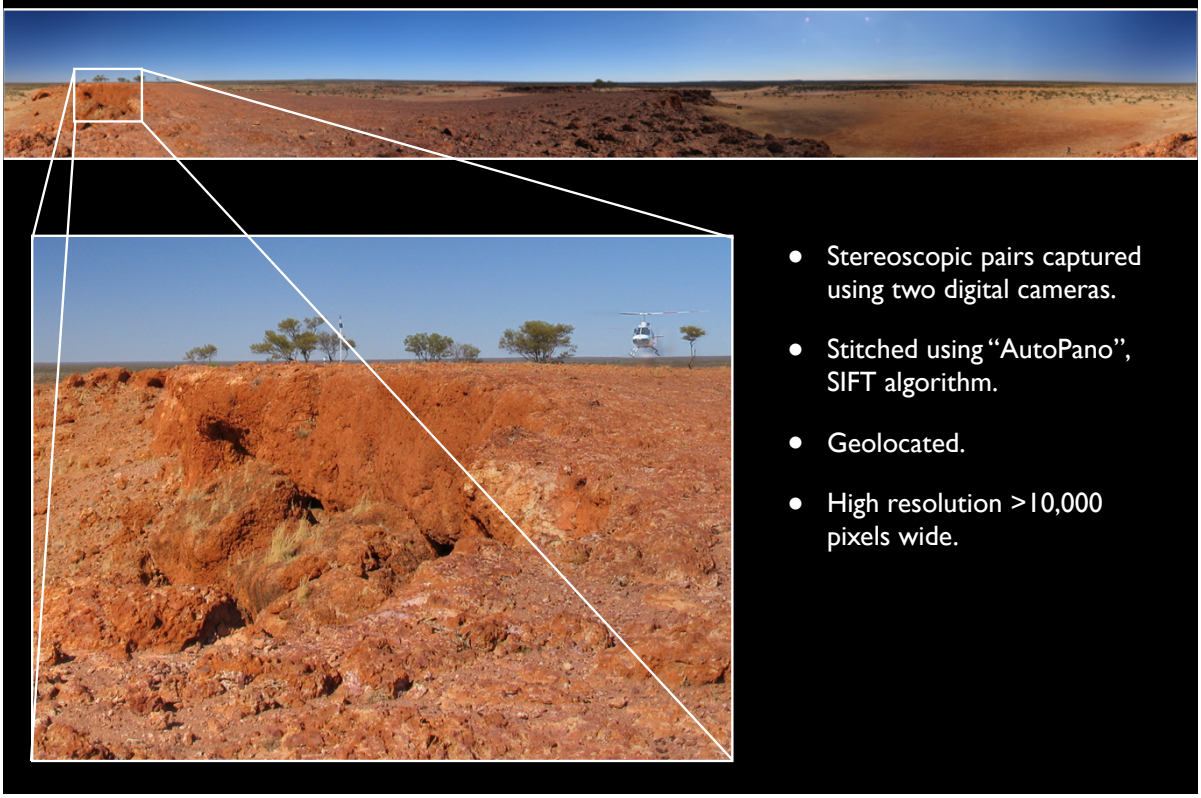
Aerial (stereoscopic) footage



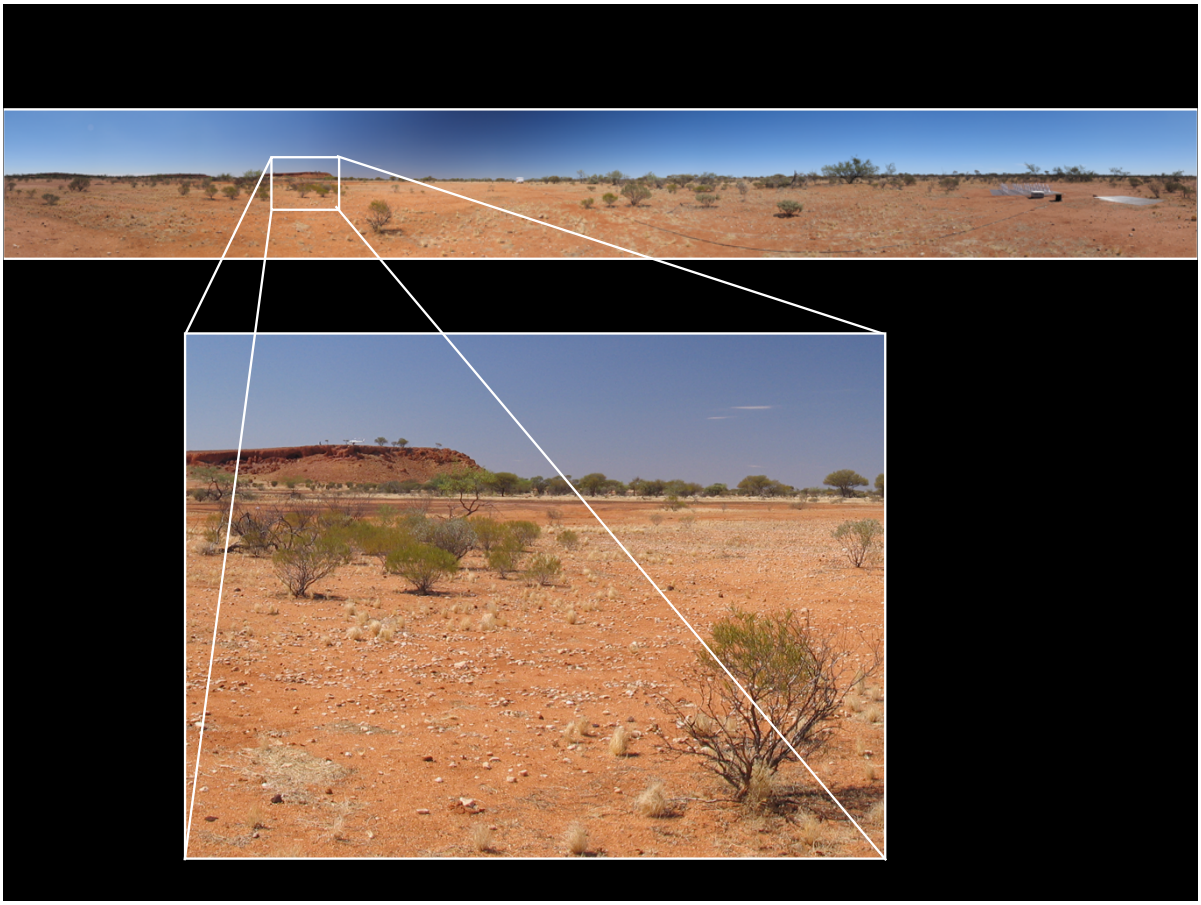

Ground (stereoscopic) photography



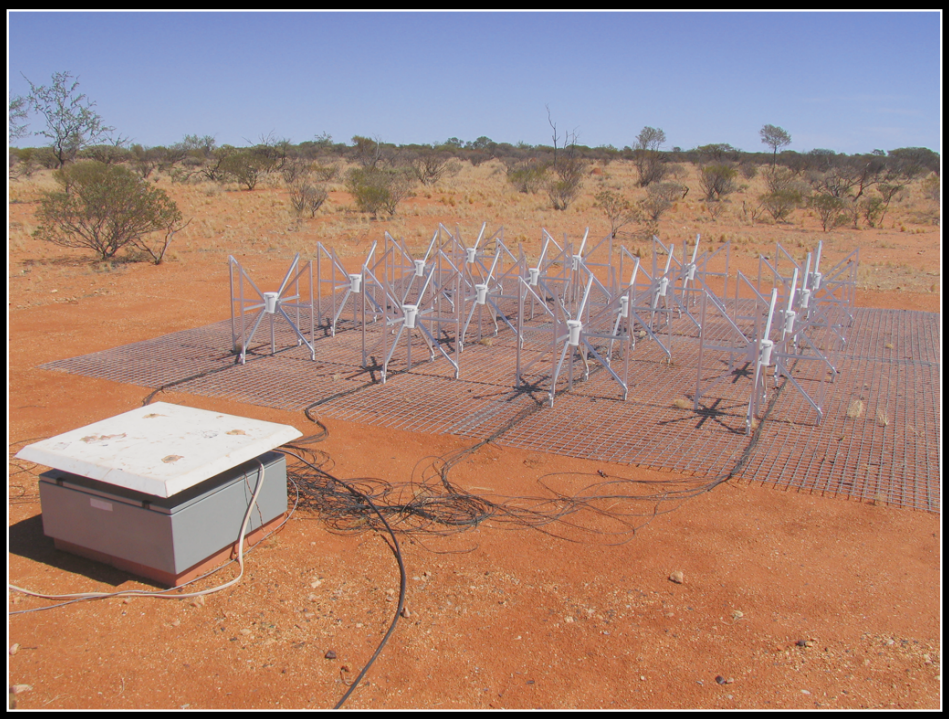

Stereoscopic panoramic images



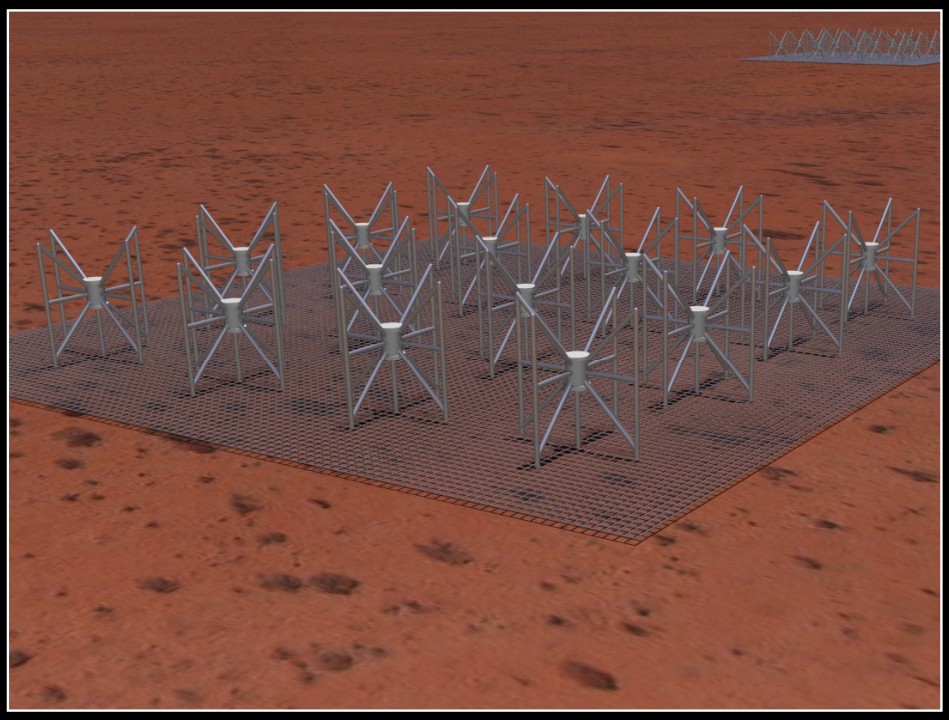
- Stereoscopic pairs captured using two digital cameras.
- Stitched using "AutoPano", SIFT algorithm.
- Geolocated.
- High resolution >10,000 pixels wide.



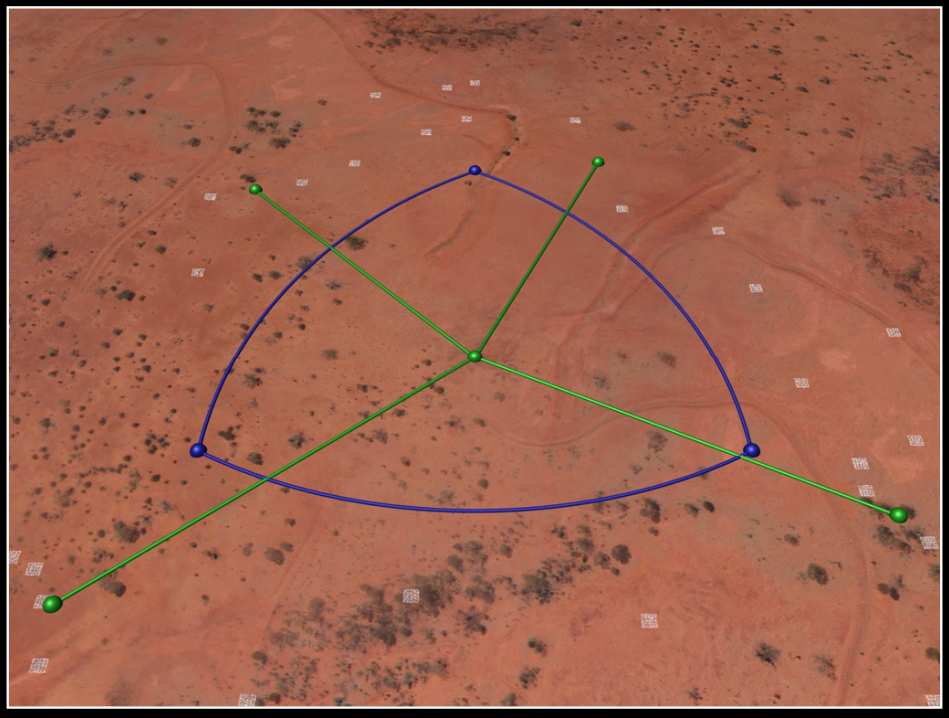
MIRA Array



Array model



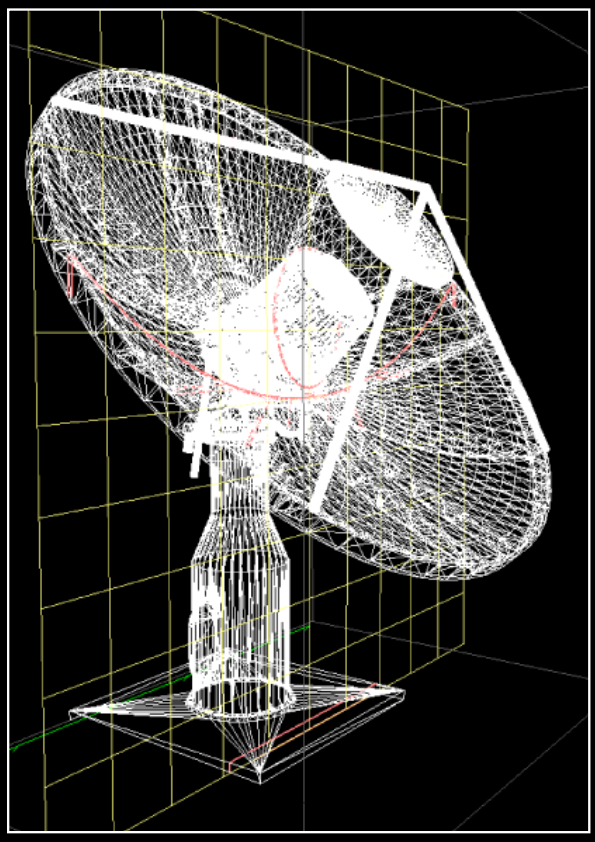
Array layout



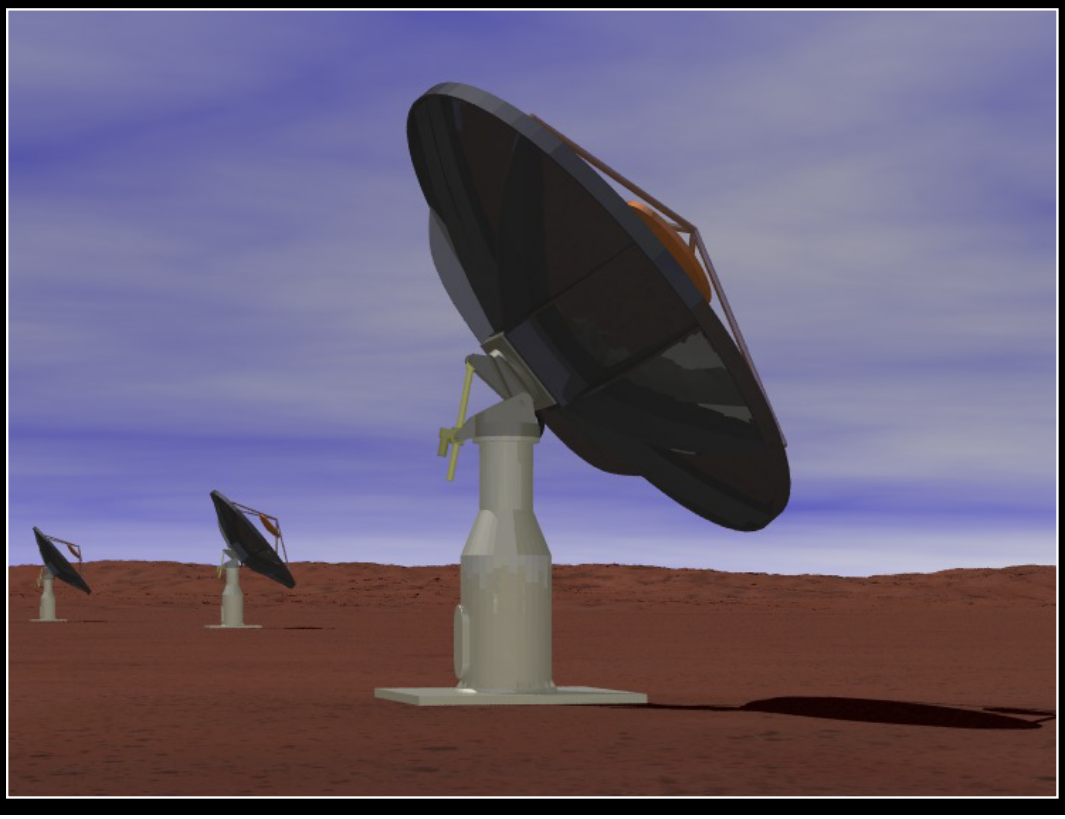
- Reuleaux Triangle, initial 32 panels.

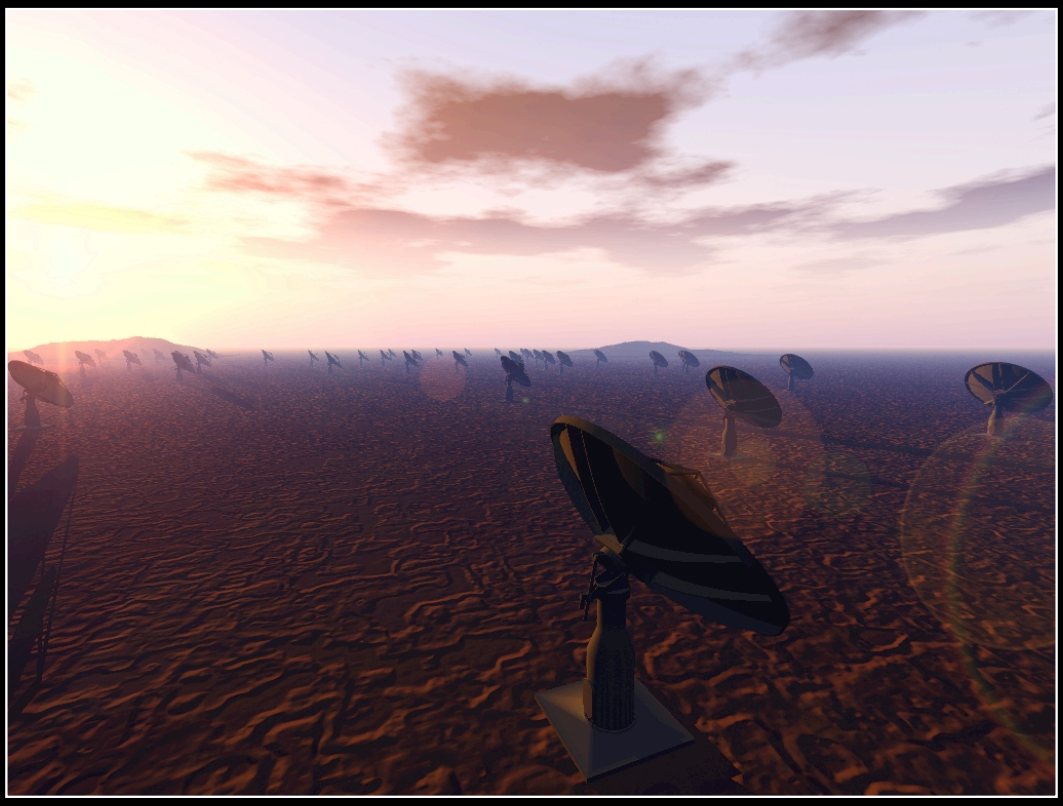
Telescope dish models

- STL format the only common exchange format offered by the modelling software being used by the engineers.
- Forunately supplied as 12 individual parts.
- Center of rotations supplied and/or derived for part animations.
- Any colours or materials are artificial except dish is likely to be carbon fibre, base is dull unpainted metal.



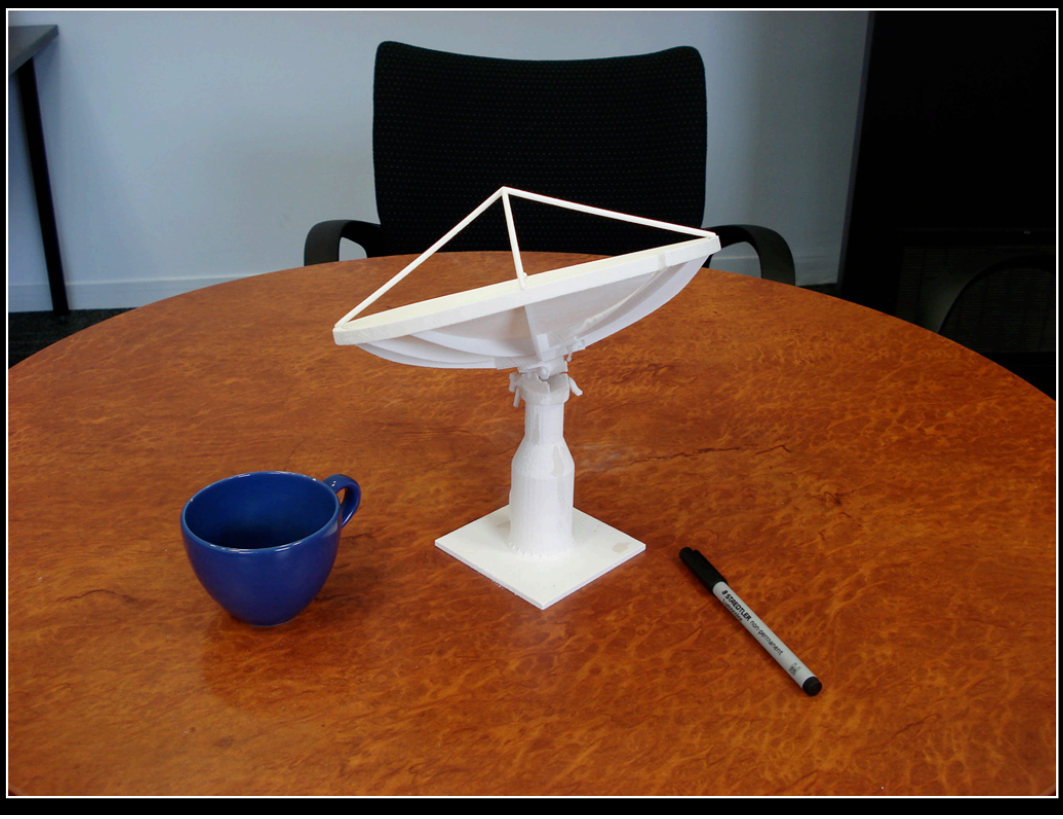
Telescope dish, initial renders





Peter Morse

Stereo lithography modelling

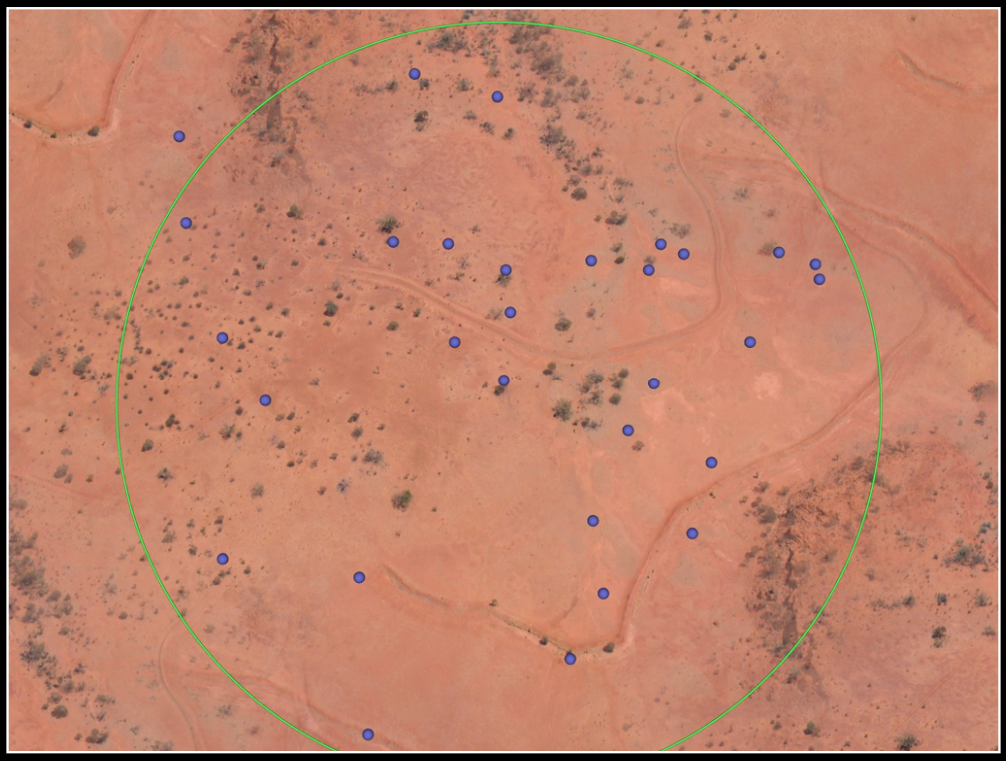


- 20cm high model
- Z-Corp rapid prototyping machine, model "Spectrum Z510".
- Does support colour but it wasn't used in this initial version.
- Current model not particularly suited to this process since not all parts had real thickness. While the machine/software will attempt to create models with single polygon structure, the result is not structurally sound.

High resolution display of panoramic images

- Panoramic images slowly pan, cross fade between 4 different panoramic images.
  Inset movies on the left corner (shown) and additional movie on the right corner (not shown).
- Almost 1:1 pixel mapping between panoramic resolution and display resolution.
- 3 x Apple 30" displays = 7680 x 1600 pixels.
- All driven by Quartz Composer, one Mac Pro, two ATI X1900 cards.

Dish layout



Location of the initial 30 dishes. Interesting optimisation problem

Navigable movie and upright dome