CryoPAF

Cryogenically-cooled phased array feed receiver for the 64m Murriyang Telescope at Parkes Australia

General Specifications	
System Temperature	$\approx 20K$
Frequency range	700-1950MHz in two bands: either 700-1200MHz or 1100-1950MHz
Bandwidth	150MHz initially, with upgrades to 600 MHz expected in future semesters
Polarisation	Dual linear polarisation
Beams	Maximum of 72 simultaneous beams in a close-packed footprint with an area of ≈ 2 square degrees. The exact arrangement will be subject to commissioning.
Parallactification	Rotation allows tracking in parallactic angle

Available Observing Modes for 2023OCT semester*	
Pulsar/FRB Search	Frequency resolution: $266.67 \times [1, 2, 4]$ kHz Sample rate: $56.95 \times [1, 2, 4, 8]$ μs Total intensity, 2-bit output per sample per channel. Maximum data rate: 9 Tb/hour
Pulsar Folding	1 boresight beam Frequency resolution: $14.815 \times [8, \ldots, 1024]$ kHz Length of output subintegrations: 8-60 s Number of pulsar phase bins: $64, 128, \ldots, 2048$ Full Stokes Maximum data rate: 100 Gb/hour
Spectral Line	1-8 beams selected from available footprint. All beams must have the same spectral configuration. Zoom bands (each with highly flexible configuration): 1-7 Frequency resolution (maximum): 274 Hz Maximum number of channels (per zoom): 16384 Sample rate: $\approx 1 \times [1, \ldots, 10]$ s Full Stokes Maximum data rate: 350 Gb/hour
Continuum/ Polarization	1-8 beams selected from available footprint. Maximum bandwidth: 150 MHz Maximum number of channels: 16384 Sample rate: $\approx 1 \times [1, \ldots, 10]$ s Full Stokes Maximum data rate: 50 Gb/hour
VLBI	1-8 voltage beams selected from available footprint Processed bandwidth: 64, 128 MHz Maximum data rate: 3.6 Tb/hour
*Actual observing parameters will initially be limited by data rate and storage constraints, with upgrades expected in future semesters	