

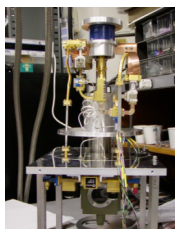


The Expanded Very Large Array

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Summary: The Expanded Very Large Array is a major upgrade of the VLA, which when completed in 2012 will offer continuous frequency coverage from 1 to 50 GHz, with approximately 1 μ Jy rms point-source continuum sensitivity (12 hours), and a flexible and powerful correlator comprising 128 independently tunable sub-bands with a minimum of 16384 channels over 8 GHz bandwidth per polarization.

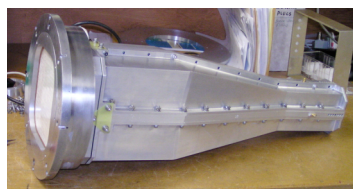
Antennas/Receivers: Eight cryogenically cooled receivers will provide the 1 to 50 GHz frequency coverage. The two low-frequency receivers at 74 and 327 MHz are retained.



26 – 40 GHz Rcvr



Secondary Focus Feed Ring



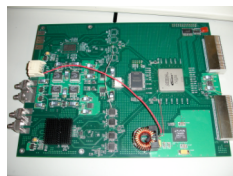
1 – 2 GHz OMT



1 – 2 GHz Horns

Correlator: The heart of the array is the Canadian designed and built 'WIDAR' correlator, offering unprecedented flexibility and power. The correlator accepts up to eight digital inputs, each of 2048 MHz BW. Each is digitally subdivided into 16 sub-bands, each of which is separately tunable, of BW 128, 64,03125 MHz. Correlator resources can be flexibly divided to match the science goals.

Digital Transmission System: The EVLA is fully digital, with sampling at the antenna. Each antenna has four 8-bit 2GSamp/sec samplers, and eight 3-bit 4GSamp/sec samplers.



3-bit 4 GSamp/sec Sampler



MCB Rack



RFI-Tight Sampler Module

Parameter	VLA	EVLA	Factor
Point Source Sensitivity (1- σ , 12 hours)	10 μ Jy	1 μ Jy	10
Maximum BW in each polarization	0.1 GHz	8 GHz	80
# of frequency channels at max. bandwidth	16	16,384	1024
Maximum number of frequency channels	512	4,194,304	8192
Coarsest frequency resolution	50 MHz	2 MHz	25
Finest frequency resolution	381 Hz	0.12 Hz	3180
(Log) Frequency Coverage (1 – 50 GHz)	22%	100%	5

EVLA Status:

- 15 antennas now retrofitted to EVLA standards with interim 20cm, 6cm, and 3.6cm receivers, and final 18 – 27 GHz band and 40 – 50 GHz band receivers.
- Outfitting of new 27 – 40 GHz band receivers begins shortly. Availability of full-band capability for each receiver band shown in schedule on the right.
- 4-station test correlator arrives in June, 10-station science correlator arrives in October, full correlator complete early 2010.
- Shared-risk early science planned for late 2009.

EVLA Wideband Receiver Availability
Prepared March 2008

