Pulsar Astronomy — 2000 and Beyond
ASP Conference Series, Vol. 202, 2000
M. Kramer, N. Wex, and R. Wielebinski, eds.

WAPP — Wideband Arecibo Pulsar Processor

A. Dowd, W. Sisk

Arecibo Observatory, HC3 Box 53995, Arecibo, PR 00612, USA

J. Hagen

Arecibo Observatory, HC3 Box 53995, Arecibo, PR 00612, USA

NRAO, 949 N Cherry Ave., Tucson, AZ 85721, USA

Abstract. The WAPP is a new Pulsar Processor for Arecibo Observatory. Key features are wideband operation (100 MHz) and good time resolution (16 microseconds).

The WAPP is a new facility pulsar backend for Arecibo Observatory. The initial system will be available for observations starting in Feburary 2000. In its initial implementation, it will handle wideband pulsar observations with particular utility as a search machine or for single pulse work. This instrument represents the first operational stage of an on-going development program. The WAPP does incoherent pulsar detection. It uses a Linux computer to rapidly unload a hardware digital correlator. The resulting correlation functions are written to disk as 16 bit unsigned integers with minimal processing. The initial system will have two IF channels of up to 100 MHz each. Nominally these channels will be configured for dual polarization observations. It is possible to measure autocorrelations from a single band or from both bands

Key Points about system available in Feb 2000

1. Wideband Operation: 100 MHz and 50 MHz modes
2. Up to 16 μs time resolution
3. Full Cross-Polarization Measurements
4. Search, Single Pulse modes
5. Incoherent (Correlation) Detection
6. 3 level and 9 level sampling modes

Planned Upgrades to WAPP

1. Flexible Bandwidth Selection from 100 MHz down to 195.3 KHz
2. Spectra; Line Modes, Full 32 Bit Integration of correlation values
3. Timing Modes
4. Bandwidth expansion to 400 MHz

References

Xilouris, K., Salter C., Cordes J. M., Pulsar Science with the Upgraded Arecibo Telescope, Workshop Proceedings, 1996

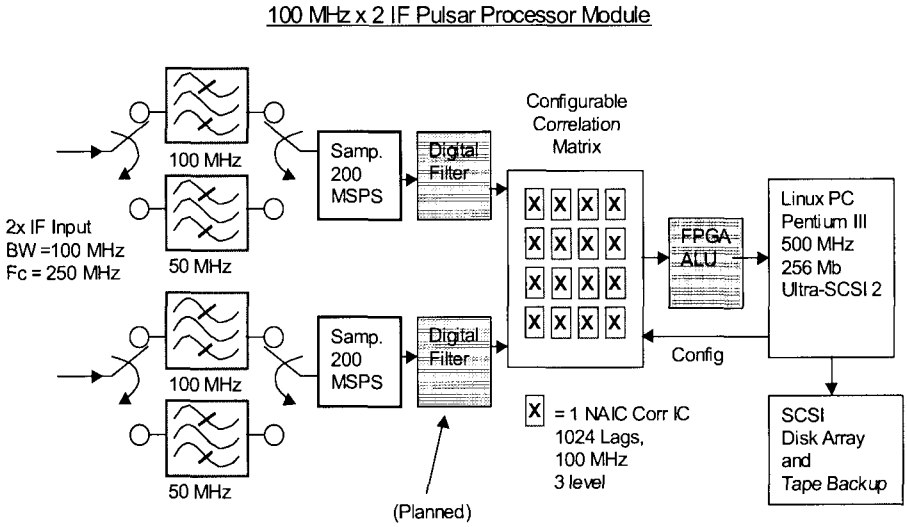

Table 1 - Available Modes for Searching or Single Pulse

	Bandwidth	Ifs	Stokes	Voltage Quant-ization	Fastest Correlation Sample Rate			Best Frequency Res. Sample Rate		
					μsec	# lags	hours	μsec	# lags	hours
1	100 MHz	1	No	3 levels	16	64	3.75	256	512	7.50
2	100 MHz	2	No	3 levels	16	32	3.75	256	512	3.75
3	100 MHz	2 (4)	*Yes*	3 levels	16	16	3.75	256	128	7.50
4	100 MHz	1	No	*9 levels*	16	32	7.50	32	128	7.50
5	50 MHz	1	No	3 levels	16	64	3.75	512	512	15
6	50 MHz	2	No	3 levels	16	32	3.75	512	512	7.5
7	50 MHz	2 (4)	*Yes*	3 levels	16	16	3.75	512	128	15
8	50 MHz	1	No	*9 levels*	16	64	3.75	64	256	3.75
9	50 MHz	2	No	*9 levels*	16	32	3.75	64	128	3.75
10	50 MHz	2	Full	*9 levels*	16	16	3.75	64	64	3.75

Hours - indicates how long WAPP can take data if the entire 108 Gbytes is used.
 # lags - indicates lags PER correlation measurement

https://doi.org/10.1017/S0252921100059704 Published online by Cambridge University Press