

1987AUG04

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SUBJECT: SHORT TIME CONSTANT PROCESSOR AT THE VLA

During June 1987 we had discussions to build a short time-constant processor at the VLA. During the discussions it was felt that we should build a 16 channel/IF filter-bank for each of the two phased IFs with a channel bandwidth of 3MHz and/or 1MHz, and sampling capability of 16CH/1ms/2IFs with a single channel maximum sampling of atleast about 16 kHz.

Over the last month we have realised that the existing MK3 VLBI system, available at the VLA, can be used for this purpose on non interference basis(i.e. the system is used only when not tied-up for the VLBI work). The MK3 system has 7 Video-converters/IF, with each converter having both upper and lower sideband outputs available on the front panel. The bandwidth of each video output signal can be selected in range 4MHz to 62.5kHz, in factors of 2, and the local oscillator for the Video-converters can be tuned in steps of 10kHz. The front panel video outputs can be given to external detectors and data acquisition system. Further, the converters have built in square law detectors for each video signal and the detected total power from each sideband as well as combined total power of both the sidebands can be monitored by the MK3 computer. Also the detected output from one of the two sidebands can be monitored through a BNC connector on the converter front panel.

We have in the Elec. Lab. a commercial data acquisition system from Scientific Solutions Inc. The data acquisition system is called TACMAR's Lab Master. It has 16 CH multiplexer and a 12 bit ADC which can be used for about 30k conversions per second.

Assuming that we can use the MK3 system for this purpose, and we can get a PC AT type computer with atleast 40MByte (desirable 140MB) disc in which we can install the Lab Master, we can assemble a 7CH/IF *2IFs system with 1ms/CH sampling capability, essentially without building any hardware(except a few cables). This would enable to

- (1) check the viability of such a system,
- (2) develop software for data acquisition and off-line analysis,
- (3) test stability of the system for various astronomical applications,
- (4) establish usefulness of such a system available at the VLA on a permanent basis, and
- (5) make some useful observations of astronomical interests e.g. Variable stars etc.

It means we should try to get a suitable computer for this with 140MB disc at an early date. Better still, we borrow (for a few months) a machine from somewhere(e.g. the PC AT meant for Scientific Building/some other user, after

summer students are gone at the end of August) and try out the system. That would give a better idea of capabilities of the entire system and the required data acquisition and computer-recording system to be used finally. For example, instead of existing multiplexer ADC system, it may be desirable to use a 32 channel multiplexer 8 bit ADC that can do about twice the number of conversions (60k samples/s) and costs about \$600.