

February 5, 1991

**To:** Potential Users of the NRAO/VLA High Time Resolution Processor (HTRP)**From:** Bob Hjellming and Miller Goss**Subj:** HTRP Use

For almost three years a low-budget effort at the VLA has been carried out by D. Bagri, T. Hankins, M. McKinnon, and various visitors to develop a capability for High Time Resolution Processing. We now have an HTRP system that can be used in a "hands on" observing mode by those familiar with this type of operation. The system has so far been aimed at pulsar work, but it has capabilities for flare stars and other short time scale radio phenomena. D. Bagri and L. Beno designed the polarization and averaging modules, NRAO staff constructed these modules, and Mark McKinnon has integrated the system, devised calibration and data handling procedures, and has done much of what was needed to make the system work. Mark is using the HTRP to do a Ph. D. thesis on pulsar polarization.

The HTRP, as it is now, consists of a detector, integrator, and sampling modules for producing the parallel- and cross-hand polarization products from the VLA analog sum. The four Stokes parameters can be recorded from up to 14 frequency channels obtained from the MkIII VLBI video converters, at aggregate data rates of up to 100 kHz. Detector parameter set-up and A/D conversion are controlled by a Compaq 80386/80387 computer. Data are written to disk and transferred off-line to standard cartridge tapes (QIC-40 standard, 3M DC 600 or DC 2000 cartridges, 40 Mbytes/cartridge). In the current year we expect to add an Exabyte or DAT tape system for longer data records; this will make it possible to record data for pulsar searches and observations of non-periodic radio emission with short time scale characteristics.

For pulsar work there are three additional components to the system. There is a signal averager with display and controls for gating the VLA correlator synchronously with a pulsar. There is a FabriTek signal averager/pulse generator developed in the early 1970's for use at the Green Bank 300-foot telescope. There is also a synchronous pulsar timing system developed by Tim Hankins and Joe Taylor's group at Princeton. Potential users should contact Tim Hankins, Mark McKinnon, or Joe Taylor for advice and arrangements to use the pulsar subsystems.

In addition to the Princeton suite of timing software, there are a number of (C language) programs to support data handling, plotting, phasing, calibration, etc.

The HTRP system is still under development and has limited documentation. It is not a supported system in the usual NRAO sense. Users must learn to run the system as it is. Potential users may submit observing proposals to use the HTRP through the normal mechanism, with the understanding that the hardware, software, and people support are extremely limited, and very little in the way of user assistance will be available. Mark McKinnon, Tim Hankins, and Dale Frail have a limited amount of time to help potential users, and can assist only when prior arrangement is made.

Despite these limitations, the HTRP is now regularly used for pulsar work, and more users would be welcome.

