

THE IOWA E-SRT PROJECT

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The University of Iowa utilizes the Haystack Small Radio Telescope (SRT) in an advanced undergraduate laboratory course and a course in radio astronomy. We have modified the original hardware and software in several significant ways to make the system more flexible. We have created a new software control system (named e-SRT) for the SRT, and in addition made several hardware upgrades to the telescope itself.

The e-SRT software is written in the Python language using the wxWindows graphical library. The e-SRT program has a flexible, user-friendly interface and runs on Linux, MS-Windows, and Macintosh platforms. It provides a large number of enhanced features, and well as several new capabilities not available in the original Java-based software provided with the SRT. Enhanced features include better telescope motion control, enhanced continuum (strip chart) and spectral line plotting, more flexible chart control, and resizable task windows. New capabilities include a client-server architecture for efficient remote operation, support for a webcam, optional archived baseline spectra, support for optical shaft encoders, and diagnostic spectral line windows.

The hardware modifications included the development of a small 'pocket' 1024-channel autocorrelator with USB interface. This allows simultaneous spectral coverage of the entire hydrogen 21 cm band (2 MHz), compared with the original SRT receiver which was limited to 500 KHz segments. We also replaced the digital receiver with a standard superheterodyne system commonly used at professional observatories. The receiver is built on an 'open' chassis so students can examine signals as they pass from RF to IF to video modules.

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