SETI Surveys With The Allen Telescope Array

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The Allen Telescope Array (ATA) is being commissioned at the Hat Creek Radio Observatory in Northern California, and is beginning the first of many surveys that will be the focus of this array's scientific program. The ATA will eventually be comprised of 350 antennas, each 6.1m in diameter, operating over the continuous frequency range from 500 MHz to 11.2 GHz. SETI observations have begun using the first 42 antennas in the array, two dual-polarization beamformers, with offset nulls, operating on a single IF 100 MHz data channel, plus the current Prelude SETI signal processing system.

We have conducted both "targeted" SETI observations of selected stars and "sky survey" observations of areas of the sky. Some observations were accomplished with the SETI program directing the pointing of the array and others were "commensal," in a direction selected by another astronomical observing program. In both modes, SETI observations used one of four possible, independent RF tunings and two synthesized beams pointing at stars or positions in the field of view and tuned to the same frequency band. Comparison of signals detected by both beams, and a dynamic database of know RFI can be used to excise interference. In some observations, each beam had a null positioned at the center of the other beam. In the long term, we plan to observe one million target stars and survey large sections of the galactic plane over the frequency range from 1 GHz to 10 GHz. Much of the observing will be done simultaneously with other large-scale astronomical surveys.