# NASA SETI MICROWAVE OBSERVING PROJECT - SKY SURVEY ELEMENT

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The SETI Sky Survey observing program is one of two complimentary strategies that NASA plans to use in its microwave Search for Extraterrestrial Intelligence (SETI). The primary objective of the Sky Survey is to search the entire sky over the frequency range 1.0 GHz to 10.0 GHz for evidence of narrow band signals of extraterrestrial, intelligent origin. Frequency resolutions of 30 Hz or narrower will be used across the entire band. Spectrum analyzers with upwards of ten million channels are required to keep the survey time approximately 6 years. Data rates in excess of 10 megabits per second will be generated in the data taking process. Sophisticated data processing techniques will be required to determine the ever changing receiver baselines, and to detect and archive potential SETI signals. Existing radio telescopes, including several of NASA's Deep Space Network (DSN) 34 meter antennas located at Goldstone, CA., and Tidbinbilla, Australia, will be used for the observations. The Jet Propulsion Laboratory has the primary responsibility to develop and carry out the Sky Survey.

In order to lay the foundation for the full scale SETI Sky Survey, a prototype system is being developed at the Jet Propulsion Laboratory. The system will be installed at the new 34-m high efficiency antenna at the DSS 13 research and development station, Goldstone, CA, where it will be used to initiate the observational phase of the NASA SETI Sky Survey. It is anticipated that the early observations be useful to test signal detection algorithms, scan strategies, and RFI rejection schemes. The "SETI specific" elements of the prototype system are:

(a) the Wide Band Spectrum Analyzer (WBSA); a 2-million channel FFT spectrum analyzer which covers an instantaneous bandpass of 40 MHz.
(b) the signal detection processor: a hardware module which executes a detection algorithm "along the scan", which reduces the data rate by factors of 1,000 or more.
(c) the SETI Sky Survey Manager, a network-based C-language environment that provides observatory control, performs data acquisition and analysis algorithms.

A high level description of the prototype hardware and software systems will be given and the current status of the system development will be reported.

This paper presents the results of one phase of research carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.