SETI League Finds New Home

In June, 1995 The SETI League, Inc. began the move into its new quarters at 433 Liberty Street, Little Ferry NJ 07643. Spacious offices, a laboratory, SETI library and conference room have been provided at no cost to the membership, through the generosity of building occupants Eventide Inc., longtime supporters of SETI.

"When Congress terminated NASA's SETI funding," observes Eventide major stockholder Orville Greene, "it became evident that privatization was the only way to keep the search alive. By providing facilities for The SETI League, Inc., we at Eventide are helping to expand the frontiers of human knowledge. It's a worthy enterprise, and I'm proud to be counted as a member."

Sproul Brothers Donate Dish

Two Central New Jersey radio amateurs have generously donated a commercial-grade parabolic antenna to The SETI League, for use in its demonstration radiotelescope. The antenna, a 5-meter diameter Comtech reflector complete with dual feedhorn and mount, is the gift of Mark (KB2ICI) and Keith (WU2Z) Sproul of North Brunswick NJ. Weighing in at over 1500 pounds, the antenna is too heavy to install on the roof at SETI League headquarters. Our engineers are now trying to devise a satisfactory ground mounting scheme.

The twins decided to make the contribution after Keith heard Executive Director H. Paul Shuch speak on our upcoming all-sky survey, at the TAPR Annual Meeting in St. Louis last February. "The low sidelobes and high surface accuracy of this reflector," comments Shuch, "will provide us with an almost negligible antenna noise temperature, significantly enhancing receiver performance." Upon helping to unload the antenna from a flatbed trailer at SETI League headquarters, president Richard Factor was heard to tell the brothers, "So long, and thanks for all the dish."

433 Liberty Street
PO Box 555
Little Ferry NJ 07643

SearchLites

the Quarterly Newsletter of The SETI League, Inc.

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Summer 1995

Technical Feature

How Many Dishes?

by H. Paul Shuch, Executive Director

Since its inception in 1960, SETI has been frustrated by limited availability of radiotelescope time to provide reasonable sky coverage. The typical research-grade radiotelescope can observe perhaps one millionth of the sky at any one time. Which means that, even should a given facility happen to be on the air at exactly the right frequency, at exactly the time an ETI signal reaches Earth, there's a 99.9999 percent chance we'll miss the call. To provide full sky coverage would require a million such radiotelescopes, which obviously the present leadership in Washington is not about to provide.

The SETI League, Inc. is trying to change all that. While we certainly can't imagine funding a million research-grade instruments, there is another way. The typical satellite TV dish covers perhaps one five-thousandth of the sky, so it stands to reason that a coordinated network of five thousand such small installations can achieve real-time full sky coverage. Our published goal of enlisting that many microwave experimenters is by no means arbitrary. That no such scheme has yet been accomplished should certainly not deter us!

The down side of the proposed sky survey is that antenna gain and beamwidth are inversely proportional. So all else being equal, an antenna which sees 200 times more sky than a giant radiotelescope is going to have to be 200 times less sensitive. This is why what I call the American Syndrome has prevailed in research-grade radiotelescope design: if a little is good, a lot is better.

From a practical standpoint, the reduced gain of amateur SETI antennas translates to reduced range. An extra-terrestrial signal which a major radiotelescope can detect at, say, 100,000 light years (the diameter of our galaxy) will still be visible to our small dishes, but at a range of only 500 LY. So amateur SETI will of necessity be concentrating on detecting those very strong (meaning probably nearby) yet highly intermittent signals of which the famed Ohio State Wow! signal is the best known example.

Yes, it would certainly be nice to have the added range with which larger antennas would afford us. On the other hand, what good does it do to have an antenna with all the gain in the world, if it's looking in the wrong direction when The Call comes in?

SETI League Vision Statement

Recognizing that receiving signals of intelligent origin from beyond our planet will change forever our view of humanity's place in the cosmos, The SETI League, Inc. envisions a worldwide network of thousands of advanced experimenters working together to hasten our entry into the galactic community.

SETI League Mission Statement

The SETI League's mission is to encourage and support the Search for Extra-Terrestrial Intelligence by:

(1) attracting interested radio amateurs, astronomy enthusiasts, microwave and digital signal processing experimenters into the SETI community;

(2) developing technologies to assist the advanced experimenter in assembling a workable SETI receiving station;

(3) disseminating hardware and software designs in support of SETI;

(4) coordinating SETI experimenters worldwide in conducting a thorough sky survey;

(5) providing a medium for communication among SETI experimenters, enthusiasts, and organizations, through periodicals, meetings, conferences, and electronic means;

(6) assembling, maintaining and operating advanced optical and radio telescopes;

(7) identifying and publicizing potential spin-off applications of SETI technologies;

(8) encouraging the restoration of public funding for the NASA SETI Office; and

(9) raising public consciousness as to the importance and significance of a broad-based Search for Extra-Terrestrial Intelligence.

The SETI League, Inc. is a membership-supported, non-profit [501(c)(3)], educational and scientific corporation.

Who's Who in The SETI League

Founder and President	Richard C. Factor
Executive Director	H. Paul Shuch, Ph.D.
Secretary	Diana Davidson
Treasurer	Martin Schreiber, CPA
Registered Agent	Marc Arnold, Esq.
Trustees:	Marc Arnold Richard Factor Martin Schreiber
Advisory Board:	Anthony Agnello Poul Anderson Robert S. Dixon, Ph.D. Bernard M. Oliver, Ph.D. Malcolm I. Raff, Ph.D. Clifford Stoll, Ph.D.

Conference Calendar

SearchLites' readers are apprised of the following conferences at which SETI related information will be presented. League members are invited to call headquarters at (201) 641-1770, or email info@setileague.org, to obtain further details. Members are also encouraged to send in information about upcoming events of which we may be unaware.

August 24 - 28, 1995: Intersection / Worldcon 1995, Glasgow Scotland. Contact intersection@smof.demon.co.uk.

August 25 - 27 1995: Eastern VHF/UHF Conference, Vernon CT. Contact Stan Helinski, (203) 872-6197.

September 30, 1995: Mid-Atlantic VHF Conference, Horsham PA, sponsored by Mt. Airy VHF Radio Club. Contact John Sorter, (610) 584-2489.

October 6 - 8, 1995: AMSAT Space Symposium, Orlando FL. Contact AMSAT Headquarters, (301) 589-6062.

October 27 - 29, 1995: Microwave Update '95, Arlington TX. Contact Kent Britain, (214) 660-2840.

November 17 - 19, 1995: Philcon '95, Philadelphia PA. Contact PSFS Hotline, (215) 957-4004.

December 15 - 17, 1995: Winter Solstice Regional Gathering, Central Pennsylvania MENSA, Lancaster PA. Contact Muriel Hykes, (717) 321-6137.

January 12 - 14, 1996: Arisia '96, Boston MA. Contact info@arisia.org.

January 31 - February 1, 1996: Second International Conference on Optical SETI, at Photonics West 1996, San Jose CA. Contact Dr. Guillermo A. Lemarchand, email lemar@seti.edu,ar; or Dr. Stuart A. Kingsley, email skingsle@magnus.acs.ohio-state.edu.

February 8 - 13, 1996: AAAS, Baltimore MD. Includes the Second Annual Bruno Dinner on February 10th. Contact Dr. Lori Marino, email lmarino@biology.emory.edu.

May 17 - 19, 1996: Dayton Hamvention, Dayton OH. Contact Tom Holmes, Forman Chariman, (513) 667-5990.

May 23 - 27, 1996: International Space Development Conference, New York, NY. Contact Greg Zsidisin, email 71055.2110@compuserve.com.

August 28 - September 2, 1996: L.A. Con III / 1996 Worldcon, Anaheim CA. Contact lacon3-info@netcom.com.

August 28 - September 1, 1997: Lonestarcon 2 / 1997 Worldcon, San Antonio TX. Contact isc2@io.com.

Recent Publications

The following articles appeared in *SETIQuest* vol. 1 No. 3. For a sample issue, SETI League members may write to Helmers Publishing, Inc., 174 Concord Street, Peterborough NH 03458, or email sqinqnet@pixelacres.mv.com.

1999: The International SETI Year, by Larry Klaes
META I and II Status Reports, by Guillermo LeMarchand
A History of the Ohio State SETI Program, by Robert Dixon
Project Phoenix Starts in the South, by Seth Shostak
SERENDIP Status Report, by Robert Quist
SETI Community Meets in Atlanta, by Lori Marino
First Call for Papers: OSETI II Conf., by Stuart Kingsley
Interstellar Probe Status Report, by Larry Klaes
Publications Watch, by Nathan Cohen and Larry Klaes

Please don't forget that *SearchLites* is *your* newsletter. Comments from members are always welcome. We especially solicit descriptions of your SETI hardware and software projects: what works, what doesn't, and why.

Our Members Write:

I wish you all the success in the world and hope we will all live to see (or hear) the first SETI message/s! Hope your efforts will survive the ravages of time. My "Starquest" project has been shelved (temporarily) for lack of support (and for my poor management) so I'll put all my efforts into The SETI League. I have a 12 foot TVRO dish (unassembled) and will get it going soon. It's perf'd solid aluminum with motorized drive -- polar mount -- like new. Also a 65K LNA for 3.7 to 4.2 GHz.

I also think some of us should consider looking in the visible, UV, IR, Cosmic, X-ray, Gravity wavelengths for SETI signals. How can we amateurs compete with Arecibo, Goldstone, etc. on the water hole frequencies? Let's pioneer an amateur SETI (AMSETI) search where nobody else is active -- we have just as much a chance there! Anyhow, good luck, and keep up the good work.

Nick Marshall, W6OLO
Sebastopol CA

Software Corner

DSP and Spectral Analysis

SETI enthusiasts lacking Government funding (and that's all of us now!) are continually seeking low-cost approaches to digital signal processing (DSP). At audio frequencies, a personal computer's sound card has been found to be a viable alternative to the more costly multi-channel spectrum analyzers used in the professional SETI community. Two pieces of spectrum analysis software, one commercial, the other shareware, have recently been tested at SETI League headquarters and found worthy of your consideration. Both perform Fast Fourier Transform (FFT) on receiver audio applied to a SoundBlaster (tm) compatible sound card.

Spectra Plus Version 3.0, Professional Edition, by Pioneer Hill Software, is a high-end Microsoft Windows(tm) based product. Those display modes which should prove most useful for amateur SETI include time series, spectrum, phase, spectrogram, and 3-D surface. In preliminary tests, it scanned a 20 kHz bandwidth at 10 Hz resolution quite easily, detecting signals 20 dB or so below the noise. It's priced at $395. Orders can be phoned to 1 (800) 401-3472.

FFTDSP version 3 runs under DOS. It was developed by AF9Y for use in amateur radio applications, especially moonbounce (EME) communication. It is optimized for digging weak CW signals out of the noise. The program will display a 300 to 1500 Hz spectrum to 2 Hz resolution. Though less spectacular than Spectra Plus (and not quite as versatile), the price is right: just $20 to register. Like all shareware products, continued availability depends upon your supporting its developer by registering your copy. The program is available from various computer bulletin boards, or you can order from Mike Cook, 501 E. Cedar Canyon Rd., Huntertown IN 46748, tel (219) 637-3399.

Editorial

Is Amateur SETI Even Possible?

by H. Paul Shuch, Executive Director

Recent link calculations have revealed what should not particularly surprise experienced weak-signal radio amateurs: the best ham SETI station we can assemble appears unable to communicate with its counterpart at the distance of the nearest star. This finding has generated concern within the SETI community. "If your system wouldn't detect the strongest signal the ETI might radiate," SETI pioneer Dr. Bernard M. Oliver told me recently, "even if it came from the nearest star, then years of listening, or thousands doing it, won't improve the chance of success. To cross the Golden Gate, we need a bridge about 10,000 feet long. Ten thousand bridges . . . one foot long won't hack it." I must admit, Barney makes an excellent point. And yet I am not discouraged. Why? In part, because the Golden Gate Bridge analogy assumes a serial process, whereas SETI may indeed prove a parallel enterprise. In addition, the crux of his argument seems to rest on how we define "the strongest signal the ETI might radiate." And this is so entirely unknown as to make speculation futile.

What happens to our range, for example, if a ham SETI station tries to receive not itself, but a MegaWatt signal from an Arecibo-type antenna? The additional antenna gain at one end of the path increases system range by perhaps two orders of magnitude, to tens of light years. And what if the ETI possesses a Cyclops? Now our potential contact range increases another order of magnitude, into the hundreds of light years. Is amateur SETI futile? Not if our galactic neighbors are more successful than we in getting their governments to fund large-scale antenna arrays. So ironically, it just might be the distant success of Oliver's own brainchild which gives hope to amateur SETI.

Hams have always been innovators, and one cannot begin to anticipate the spin-off technologies which might result from the search. Just as the thousand monkeys at a thousand typewriters might some day write out the whole Encyclopedia Galactica, might not a thousand digital signal processing experimenters, pushing a thousand different algorithms, someday find the key to digging another 20 dB into the noise? It would seem that amateur SETI is a no lose scenario, even if we hear not a peep from the stars.

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