

L5 NEWS

March 1979



L-5 NEWS

A PUBLICATION OF THE L-5 SOCIETY

VOL. 4 NUMBER 3 MARCH 1979

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Publication office: the L-5 Society,
1060 E. Elm, Tucson, Arizona
85719. Published monthly.
Subscription: \$12.00 per year,
included in dues (\$20.00 per year,
students \$15.00 per year). Second
class postage paid at Tucson,
Arizona and additional offices.
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Change of address notices, undeliverable
copies, orders for subscriptions, and
other mail items are to be sent to:

L-5 Society
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1620 N. Park
Tucson, AZ 85719

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Bound For Glory

by H. Keith Henson

"What should I do to improve my chances of going?" In the last four years, giving perhaps 100 lectures on space colonies, this is the most persistent question I have been asked.

It's a hard question because (among other obvious reasons) the answer depends on who does it. For example, were the Japanese to build space industries out of their balance of payments excesses, learning Japanese and the proper way to drink green tea might be the most important thing you could do. If the U.S. government does it, joining one of the armed services could be a smart move (veteran preference in civil service). A private enterprise outfit with too many eager job applicants might want you to be an early stockholder. I admit to being partial to a company doing the job. It decreases the chances of job applicants (like me) having to put up with psychologists prodding us with electric shocks while we try to solve problems hunched over in the dark! The social scientist types have just too much hold on the government.

What causes space to be settled and how it is done makes a difference, too. Your expertise as a turbine blade machinist will be of little avail if solar cells turn out to be the power generation method of choice for solar power satellites. Likewise, your years of research in purifying and doping semiconductors won't help much if turbines are the way to go. Even your deep knowledge of phased array radar won't help if they bring the energy down by laser or turn it into antimatter and bring it down in a bag. If some massive breakthrough in fusion makes SPS unattractive, manufacturing planetary sunshades (to compensate for waste heat) or illuminators (to ward off an ice age) may be the requisite skills. You are just going to have to keep up on developments.

Of course, if it takes 50 years, and no longevity breakthroughs are made, about all we can do is save up to buy a retirement

place in "Sun City in the Sky."

Other factors that might have an effect on your chances are hard to change. Females and minority groups probably have a better chance (provided the current social action plans remain in effect), but sex change operations and allover tatoos are not recommended. Lots of money is another way. With enough money you can build your own space colony, but please, no more bank robberies!*

"Well, what can I do to improve my chances?", I hear you say. Here's my list. Add what you will, or make your own.

Education: Get a solid practical knowledge of elementary physics and chemistry. You need not be an expert, but your life, and the lives of those around you will depend on sound judgement of physical and chemical effects. I think that for the first few years no one, including the gardener and the cook, will go without a college sophomore level knowledge of these subjects. If you are not up to this level, consider your local community college or correspondence courses. Anybody who can multiply three numbers together can figure the force on an airlock door.

Experience: Work on the Alaskan gas pipeline, or spend a winter at McMurdo sound in Antarctica. A tour of duty on a Polaris submarine would be ideal. Work on an offshore oil rig might suffice, or some other really isolated place. Many years ago I put in some time with a geophysics crew in the near vacuum (7psi) of the Peruvian Andies. I found that some people like isolation, some are indifferent, and some go stark raving mad! Find out. It's embarrassing, not to mention expensive, to be shipped back. (If you don't like isolation, wait till the second or third group goes up. By then the discotheque

will be open.)

Health: If you smoke (tobacco that is), quit. 1) It's dangerous to your health in a space habitat. Non-smokers may ask you to smoke outside. 2) You may not live long enough to go.

Otherwise stay in good shape. Get a first aid card. Your local Red Cross offers classes for a small charge.

Hobbies: Try mountain climbing (with ropes), or skydiving, or hang gliding. Learn to fly a light plane, or learn scuba diving. Occupation as a miner, fire fighter, or farmer might substitute.

All of these have a tendency to maim or kill the careless (and sometimes even the careful), but they do teach the importance of doing things right. Be sure to get qualified instruction, pay attention, and be careful. There is a saying in aviation, "There are old pilots, and bold pilots, but no old, bold pilots."

Miscellaneous skills: Learn to cook. If you don't know how, help someone (who does know) to butcher a hog. You never can tell when such a skill will come in handy. In the middle of the night on a recent business trip to Iowa, I came upon someone who had just run over a hog. The highway patrol told the guy who had run over the hog that he couldn't leave it there, so I cleaned it and he took it home. (I would have taken it, but American Airlines won't check a dead hog). Not only is this a useful skill, but you will improve your LLQ.**

And if in spite of all our efforts we end up stuck on the ground while others go up, remember a) there's another ship next month, and b) until the shielding is up, the bitter wind of a solar flare can blow out their candles.



That's Lazerus Long Quotient, see page 265 — page 248 paperback — in **Time Enough for Love by L-5 Director Robert A. Heinlein.

*See "Far Out Crime," L-5 News, Sept. 1978

Government Rip-Off?

Were the 1978 Solar Energy Policy Forums merely misrepresentations that swindled taxpayers out of millions of dollars?

Why was testimony concerning SPS ignored in the government summaries of the forums?

Why the huge discrepancies in the attendance reported in government statistics and attendance counted by eyewitnesses?

Why did the "broad spectrum" of public opinion reported by the government turn out to mainly include those who favor decentralization and "do-it-yourself" renewable energy systems?

By Jennifer Atkins

On Sun Day, May 3, 1978, President Carter announced a Domestic Policy Review of Solar Energy. The goals of this review sounded promising: to analyze the contributions solar energy can make, to review current solar problems, and to recommend a strategy to pull together the efforts of private, Federal, and state sectors.

Dept. of Energy (DOE) Secretary James R. Schlesinger, Chairman of the Review, sponsored a series of eleven forums in order to receive comments on solar energy from a broad spectrum of the public. Transcripts of these forums are being assimilated and presented for the President's consideration. We at L-5 are seriously questioning the processes used to set up these forums, and we have reason to believe that the official results of the hearings contain unexplained inaccuracies.

A Stacked Deck

These hearings were the responsibility of the Department of Energy. They contracted out the publicity and reporting of the hearing to the Franklin Institute. We believe the publicity was designed to attract only a portion of the spectrum of those interested in solar energy. In particular, the bias was towards those with anti-technology, pro-decentralization preferences.

Mailing lists were used to give people advance notice of the forums and registration cards for scheduling speakers. Instead of using primarily their own

mailing lists, DOE used lists provided by the National Solar Heating and Cooling Information Center and the Institute for Local Self Reliance.

The National Solar Heating and Cooling Information Center provides information on primarily domestic commercial solar heating and cooling systems. It does not have any information on large scale solar energy systems. Their mailing list is derived from individuals, groups, and small manufacturers who are interested in "soft technology" solar energy systems. Approximately 300,000 names came from this source.

The Institute for Local Self Reliance provided 100,000 to 200,000 names. Although these names reflect a broader spectrum of interests in solar energy, the majority of views is in favor of the do-it-yourself renewable energy systems.

To these two mailing lists, DOE added 5-10% more names from their own lists of businesses, universities, unions and other small special divisions.

These mailing lists do not represent a broad spectrum of the public interest in solar energy but rather a very narrow focus of opinions. This is also true concerning the groups sub-contracted to assist regional DOE offices. The Franklin Institute, of which the National Solar Heating and Cooling Information Center is a part, was contracted to handle most of the logistics of the forums. Also, the Institute for Local Self Reliance was given

a contract to provide aid to the regional DOE offices in the form of recommending "appropriate" speakers for the forums. They sub-contracted this to local groups that included the New Roots group in Boston, a group that favors "decentralized, low-technology, community-controlled solar energy," and the Cascadia Regional Library in Eugene, Oregon, an environmental group.

The Hearings

The hearings of each region were summarized in 10 reports. The **Consumer Briefing Summary #7** gives brief summaries of each of the 10 regional hearings and summarizes the July 13 Washington hearing. The Franklin Institute and its subcontractor, the Institute for Local Self-Reliance, prepared another report under a DOE contract, entitled **The Great Adventure**, dated October, 1978. The hearings are also summarized in the recently completed movie, "Solar Energy — The Great Adventure." We have reason to believe that the reports of the hearings are inaccurate.

Hearing Attendance?

The **Consumer Briefing Summary** states that 10,000 people attended the hearings. **The Great Adventure** states that 2,500 attended the Boston meeting, stating, "We may roughly conclude that between 7,500 and 20,000 people came to listen or ask questions." We looked at the Region 1 **Summary Report** of their hearing, and sure

enough, they estimate over 2,600 attendees. However, a group of six solar power enthusiasts who were handing out solar power satellite literature at Faneuil Hall (site of the hearing) report that the vast majority of the head count was due to the vacationing families visiting the historic building.

An observer for the American Institute of Aeronautics and Astronautics reported 50 people in the New York City hearing room. The Region 3 report gives a head count of 200. Gordon Woodcock, who testified at the Seattle hearing, reports 25 in the room. Our estimate of total hearing attendance is around 2,000.

SPS Testimony Ignored

The *Great Adventure* states that about 1,350 people testified. The *Consumer Briefing Summary* insists that 3,000 testified. Testimony covering solar power satellites was ignored in the statistical breakdown in *The Great Adventure*. This is not because there wasn't enough testimony to warrant inclusion. We are aware of at least 12 oral presentations entirely supporting power satellites, and one in opposition. While this is ignored in the statistical breakdown, the 10 who covered solar thermal electric, the 8 who discussed ocean thermal and the three who

touched on industrial process heat were represented.

What happened to the solar power satellite testimony? For example, in the Boston hearing four of those presenting oral testimony covered the favorable aspects of SPS and one opposed it. This represented nearly 10% of those giving oral testimony. However, only 1% of the summary of oral testimony covered the subject. The *Consumer Briefing Summary* contains three very brief references to SPS, all negative. *The Great Adventure* has no references to SPS.

Conclusions of Hearings.

After first stacking the deck by selective publicity and then by eliminating testimony that didn't fit the Franklin Institute/Institute for Local Self-Reliance mold, their conclusions are not surprising. "The support for solar energy was far less a response to the energy crisis or the need for a switch from nonrenewable to renewable energy resources than it was a reaction to the scale of institutions in America." "Stop laboring under the impression that energy is a technical problem. It is not. It's a social problem." "The dominant theme of every hearing was strong support for the decentralizing and self-reliant characteristics of solar energy."



ACTOR EDDIE ALBERT, well known for his television and film roles, is narrator for the new DOE film "Solar Energy—The Great Adventure." Shown with Albert in the recording studio is Joe Carvajal of DOE's Office of Consumer Affairs, production coordinator for the film which will be released in a few weeks. The film features alternate energy "pioneers," who presented testimony at the Domestic Policy Review's Series of public meetings on solar energy, at work in various locales around the country. (DOE Photo by Owen)

Notes on the "Great Adventure" Movie

by Ken McCormick

The DOE has just completed a movie, "Solar Energy — The Great Adventure," which is supposed to report on the solar energy hearings. Consumer Affairs claims not to know at this point how the film will be distributed, but I am told that it will at the very least be sent to all local consumer affairs officers to be loaned out to whomever should request it. It may also go to a commercial distributor. Hobson & Holmberg of DOE say they already have so many requests for it that they don't know how they will handle them all.

The film opens with a recounting of how President Carter called for the Domestic Policy Review of Solar Energy (DPR) and how 3,000 people testified and 10,000 people participated.

Some of the participants then state their views for the camera. One participant says that the point of this whole thing is to be self-sufficient and to get away from big systems that we can't control. Nobody in the film says anything that would tend to contradict this point of view.

Eddie Albert says that people may disagree on when it may be done or how to do it, but they agree that solar energy will happen. He goes on to say that entrepreneurs can do it themselves and backyard "tinkerers" can do it themselves.

Now the film examines specific instances of solar energy being used today by DPR participants. First, we look at what appears to be an apartment complex called Ventura del Sol. The builders couldn't get help from the government to build it, so they did it all themselves. In doing so, they created new jobs. The camera focuses on some long-haired guys and it is explained that these fellows were unemployed before they came to work building this simple solar energy equipment.

The next solar example is a man named Peter Sardana, who finances solar homes. He explains that solar energy hasn't been able to compete very well with fuels that are subsidized by the government. Solar energy is just now crossing the financial threshold, he says.

Eddie Albert explains that solar energy means "people doing things on their own."

We visit an Institute for Local Self Reliance-type group in NYC which provides energy-related assistance to low income people. We are told that a wind turbine will aerate compost which will be

used on vacant lot vegetable gardens. We are told that this is an example of "appropriate technology." We are shown a mural painted by neighborhood teens and are told that this solar project has brought them together and aroused their interest in doing constructive things.

Eddie Albert remarks with obvious awe that these people are pioneers.

We are shown a hydroponic greenhouse in San Bernardino, where black people are finally making good with the help of solar energy. It has provided jobs for them.

Eddie Albert tells us that there are industrial counterparts to these just plain folks, and that they are just itching to get going on solar energy. Beautiful scenes of the American countryside stir us to a patriotic fervor as Eddie Albert repeats the half-truths that jobs are created by this new industry — that with this form of energy, small backyard inventors and small businessmen finally have a shot at the American dream — that the government will encourage communities to small-scale decentralized energy (Eddie emphasizes the word "decentralized") — that decentralized energy is by nature community-based — that decentralized energy will minimize damage by foreign interference or natural disaster.

Oh, yes. For more information, we are urged to write to: "The Great Adventure," U.S. Dept. of Energy, Technical Information Center, Oak Ridge, Tenn. 37830.

The DOE has also recently proposed making a film on solar power satellites which we are eager to see realized.



DOE Moves Powersats to Front Burner

\$8 million in '80?

People often slip into thinking of government agencies as single integrated entities that act with one purpose and one mind. Then it's easy to become confused when these agencies take actions that seem to contradict themselves. Just in case this happens to you after reading the "Government Rip-Off" article earlier in this issue and then the following article "DOE Moves Powersats to Front Burner," here is a reminder: DOE is staffed by many different people with just as many different ideas on how things should be done. From the different moves that we've seen DOE take regarding SPS, we can safely conclude that there is much disagreement within the department on this topic. —JA

by Carolyn Henson

Just last spring the U. S. Department of

Space Shuttle Club of Japan

by Iwao Eto

The Space Shuttle Tomo-no-kai (Space Shuttle Club of Japan) was formed last December in Tokyo. The purpose of SSCJ is to enlighten people about the new space era, represented by the Space Shuttle.

The first meeting was held on December 16, 1978 with some eighty people attending, including the press. Jitsuo Kusaka, the famous space and science journalist and the president of the Japanese Astronautical Society, was

named president of SSCJ.

The membership fee is 3500 yen (about \$18), and members receive a badge, a guidebook, and a reservation ticket for a future Space Shuttle seat (which also acts as a membership card).

The address of SSCJ is:

4-23-8,
Nakaochiai,
Shinjuku-ku
Tokyo, 161, JAPAN



President Kusaka explains Shuttle workings at the first meeting of SSCJ.

Energy (DOE) was planning to hold solar power satellite expenditures to \$4.6 million in 1979 and pare them down to \$3.4 million in 1980. However, the dread Office of Management and Budget (OMB), those penny pinchers of the White House, recently surprised Congress with a 1980 powersat budget of \$8 million.

Why, in spite of demands for spending cutbacks, did the White House decide to pump money into the power satellite program? DOE insiders say the answer is simple: there's real promise in the scheme.

DOE is also warming up to some of the more exotic powersat options. They are studying laser energy transmission and are considering the use of extraterrestrial resources for space manufacture of powersat components.

Over in NASA a study on the use of Moon mines as a source of powersat raw

materials (see "Lunar Resources Study Underway," L-5 News, May 1978) is nearly completed. Its tentative conclusion is that Moon mines make sense if you build enough powersats. The issue to be resolved is simply whether 5 or 50 or 500 are "enough". If the answer is closer to 5, then Moon mines, space factories and orbiting cities would be built early in a powersat construction program.

Of course, OMB approval of a stepped-up powersat program isn't quite the same as money already in the bank. But given the vociferous support of people such as Representatives Fuqua and Flippo and Senators Stevenson, Melcher, Schmitt, and Goldwater, it's a cinch that Congress will O.K. the White House call for an expanded solar power satellite program.



Space Policy

Scientists, politicians and industry representatives objected to Carter's space policy in Senate hearings.

by Ken McCormick

President Carter's space policy came in for some sharp criticism at hearings before the Senate Subcommittee on Science, Technology and Space last January 25, 31, and February 1. Many witnesses offered testimony which expressed the opinion that the present space policy is inadequate to provide a strong sense of direction for business, industry and science.

Corporate Views

A statement from Dr. John L. McLucas, president of Comsat General Corporation, was typical of the concern expressed by representatives of business and industry: "We are now in a fiercely competitive global marketplace in which technology, including space technology, is critical to the nation's competitive posture. Others are competing for leadership in space and for the commercial markets which space will continue to open up. They have made significant advances in the past years.

"In order to meet the challenges of the future in the area of space applications, particularly with respect to the provision of space services, we need to do wherever possible what was done in the Satellite Act (of 1962), namely, (i) establish policy goals; (ii) take decisive action to engage the technical, financial and management resources of the private sector in the establishment and operation of space systems; and (iii) provide for appropriate cooperation and delineation of responsibilities between the private and public sectors in the achievement of these goals. A policy which incorporates these elements with respect to space applications will remove ambiguities and uncertainties which tend to suppress and delay initiatives in space and otherwise undermine the U.S. leadership and commercial position in space.

"Clearly, the decisive policy decisions taken by the Congress in the case of satellite communications, which

were largely responsible for the success of satellite communications, are lacking with respect to future space applications. In our view, the Administration's civilian space policy is unclear... as to the role contemplated for the private sector in space applications."

Benefits to the Economy

Mr. Ted Smith of McDonnell Douglas Astronautics characterized "the substantial pool of management, engineering, test, and manufacturing capability that now exists" as representing "a valuable national asset." He went on to say that his company believes that the government "must define long range goals and provide "seed money" in research areas that exhibit high potential in terms of feasibility and utility. This "seed money" can feed back into the economy in many ways; more jobs, improved health, and better living standards, to name a few. The relatively high cost and the associated financial risk of most potential future space products act as deterrents to private industry. It is the low or uncertain probability of a near term return on investment that dampens private industry's enthusiasm for these projects. We believe that for the foreseeable future, the government must initiate and support space experiments and pilot facilities for conducting research in Earth orbit. When the capabilities and potential of manufacturing or processing commercial products in space have been established, attractive applications will be exploited by private industry as a matter of course."

Small Business Views

The point of view of the small business community was represented by Gerald R. Seeman, president of Developmental Sciences, Inc.: "A small business doing business in state-of-the-art aéro-

space technologies offers a team of innovative people capable of rapid response, flexibility, and endless energy. These teams need the opportunity to have a consistent flow of funds through government research, development and prototype contracts with fair profit allowances to stimulate new ideas and to maintain the team continuity and its morale. It's here where the majority of this nation's products of tomorrow will germinate. Small business needs a National Space Policy Act in order to reasonably anticipate a market for our talents."

Dr. Seemans also expressed a preference for Senator Harrison Schmitt's space policy bill, and said he felt that space colonization was an option that must be considered.

Scientific Returns

The president of the National Academy of Sciences, Dr. Phillip Handler, complained that last-minute funding decisions on missions of space exploration were resulting in scientific returns that are far smaller than those that could be achieved with adequate long-range preparation. "We are doubtful," said Dr. Handler, "that a coherent program can survive without a formal national, long-term commitment; in the absence of such commitment, if decisions were to be taken sporadically, each considered within the context of a single annual budget cycle, the losses to science could be substantial and of national proportions." Dr. Handler went on to say that the legislation on space policy introduced by Senators Adlai Stevenson III and Harrison Schmitt would foster and protect a sense of commitment.

Press, Stevenson, and Schmitt Debate

As spokesmen for the Administration, NASA Administrator Robert Frosch

and presidential science advisor Frank Press defended the space policy put forward by Jimmy Carter, describing it as "vigorous" and as providing a "positive source of direction." "The era of 'one-shot spectaculars' is over," said Dr. Press, "and the space program will now proceed in an 'evolutionary' manner."

Dr. Press said that space policy must be sensitive to the "new realities of economic and fiscal policy that must govern the nation in the 1980's." The foreseeable national economy and existing priorities "clearly dictate that we make choices," said Press. As resources and manpower requirements for Shuttle development phase down, he said, we will have the "flexibility" to increase or decrease space funding levels.

Senators Adlai Stevenson (D-IL) and Harrison Schmitt (R-NM) debated press on the relative merits of their own space policy bills vis-a-vis the Carter Space Policy.

Stevenson: I sense that this Administration's objective is reorganization, study and restudy, and that is one of the reasons it is such a small achiever. Let me cite, for example, your points about the Administration policy and my own bill, which establishes a space policy. You say it's the Administration's policy not to commit to future programmatic activities without first undertaking necessary evolutionary research and development steps.

Now research and development doesn't occur in a vacuum; it occurs in the pursuit of some objective. Why not begin to establish the objectives of our space policy, the next steps, and the capabilities that we are going to need, instead of continuing through inter-agency reviews and reorganizations and research and development? What is wrong with setting out some near-term objectives? Doesn't such an approach give us in our annual budgetary considerations an opportunity to consider the budget in something other than a vacuum?

And I notice also you say, priorities should be set, depending on the promise of the science and technology available, which I'm suggesting to you won't be available in the budget situation at a given time.

Why is it the budget must always run the government? Why don't we decide what to do and let that determine what the budget will be? I sense also that OMB (Office of Management and Budget) is driving the President. It's driving the country, instead of the other

way around.

Press: That's precisely what we thought we were doing in setting out our civil space program. We laid out a framework; we laid out our goals so that space policy would not develop as part of an annual budgetary process. That procedure worked this year because, in going through the space budget and going through its projections for the out years, we used precisely the civil space program decisions of the President in setting the priorities, in making sure the NASA budget in this very tight year was protected to the greatest extent possible.

We believe we have the framework, we have the goals that you want us to have, and that this will be a main part of our budgetary procedures.

Stevenson: Well, maybe we ought to try to agree, then, on what those goals are and get a little bit more specific. Mine don't lock us into any rigid timetable. They're 10-year objectives, all subject, of course, to annual authorization and appropriation requirements, all subject to being moved by the speed with which we develop the technology and budget considerations.

Schmitt: I can't tell from this (indicating Press's written statement) where this country is headed in space, Dr. Press. You say — and, I think, rightly — that there are a lot of things that we ought to do in applications and

communications and weather forecasting, public-service satellites. That's true, but that's what we *already* can do. That policy direction was set years ago. Beyond that, policy which has already been set by the past, there's nothing in here. This isn't a policy statement.

You make reference in here to "we're getting away from the era of one-shot spectaculars." What "one-shot spectaculars?" The Apollo program was a series of missions. It had one specific goal when it started: put a man on the Moon and return him safely to Earth. But it became a program, not a "one-shot spectacular." The exploration of the Moon in the first cut was accomplished by the Apollo program.

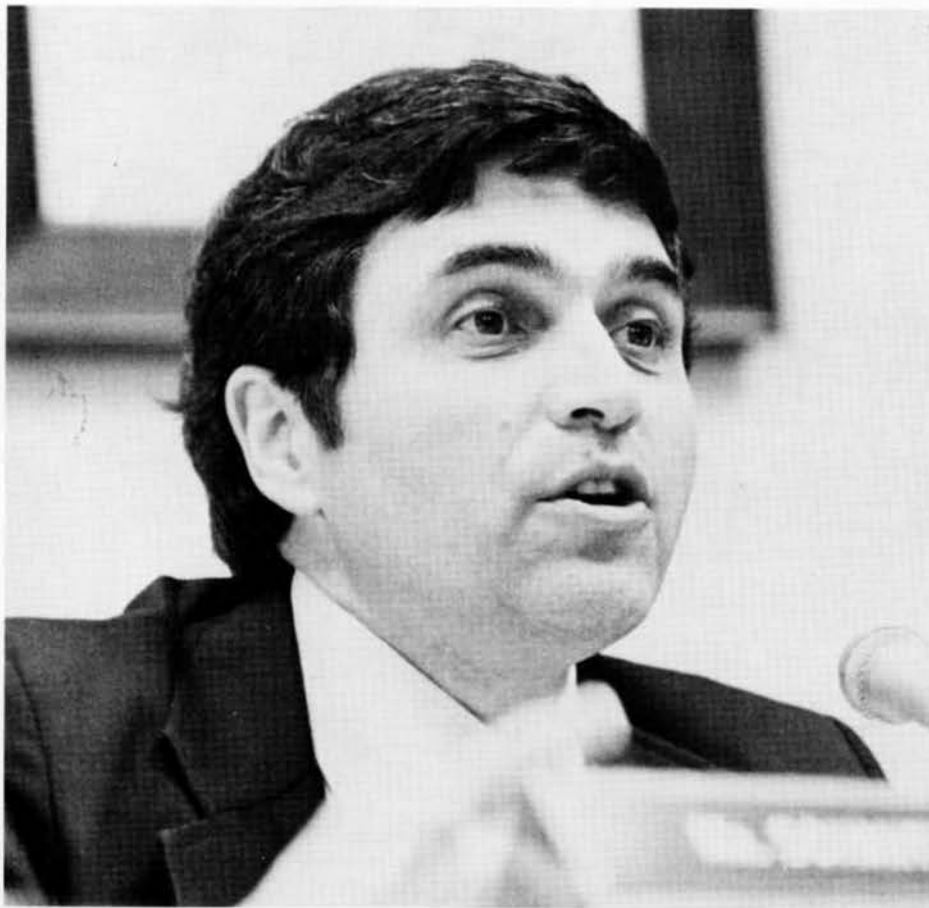
Skylab was not a "one-shot spectacular." It developed through three missions a broad understanding, a knowledge of what the new environment of near-Earth space can provide — the weightlessness, the high vacuum and high pumping rate, the view of the Earth, the Sun, and the stars.

We now know what we can do if we're just willing to commit to some kind of direction, and that's what I don't see in this policy, and I think that's what Senator Stevenson in his way and I in mine are trying to get out of the Administration: some sense of direction. Right now the people who are going to have to carry out a space policy won't get



Senators Schmitt and Stevenson at the Senate Subcommittee hearings.

(photo courtesy of Charles Divine)



*Schmitt: "What we are missing is the policy for the future."
(photo courtesy of Charles Divine)*

anything out of this document other than a statement "we're going to continue to look at it and then maybe someday we'll make some decisions." This country can't afford to tread water much longer on this particular issue.

Press: Senator, we believe we have a program outlined for space sciences exploration and application in the years ahead which will return to the American public major dividends on the investments of some hundred billion dollars over the years, which is a realistic program in terms of the country's fiscal state, and which will maintain leadership of this nation in space.

Schmitt: The return on that investment of a hundred billion dollars is every day around us. And if somebody could just figure out how to calculate it, the return is probably close to a trillion dollars, just in the period of time we've had that investment before us.

The Administration's implication is that we've gotten nothing out of the space investment. The President implied it in his speech at Kennedy. You've implied it here in this. And I have seen it in print other ways, from administrative statements. The thought expressed again and again in these statements is

that somehow or another technology is not an investment, that it's something added on to the budget, whether it's space or energy or something else, and that we get nothing from that.

It is the only thing that this government can invest in that is deflationary, inherently deflationary. It creates new goods and services. So, what we're getting is, I think, a lot of economic dogma about space and about technology out of the Administration that is going to make it very difficult for the Congress to come to any decision. What this country needs is a rejuvenation of our inherent American willingness to create new things.

Press: I don't want to argue with you on the basis of your economics. I agree with you that we have received major dividends in the past, and that we will receive many more in the future.

One of the President's major tools in fighting inflation is control of the expenditures of the Federal Government, and that's why he submitted this very tight budget. Despite those restraints, these programs which we have committed to will go on, will continue, and we have room for even additional programs in these areas. The

President's research proposal this year will bring research support by the Federal Government to an all-time peak in deflated dollars. Why has he done this? Because he agrees with you that research, that science and technology is a tremendous investment for this country to make, and he is undertaking to do that.

Schmitt: Dr. Press, we heard some similar statements like that in the last budget, of increases in basic research funding. But when it came down to how much the Administration really wanted those things, we didn't see a great deal of lobbying activity here on the Hill to protect those requests. I hope that we will see more intense activity to back up the statements that you have just made here in the Congress than we saw last year. I also hope that we can get away from this feeling that somehow or another, when there's a deficit, that all expenditures are equivalent in their inflationary impact. They are not. That is just economic lunacy.

Now, all of those things that you described that you say are protected in this year's budget and have been protected by the Administration are, again, representative of policies that were established years ago. Those aren't policies; those are the implementations of policies. The fact is, I would like to see those policies implemented further. I think everybody would.

What we are missing is the policy for the future. All that is in this statement that we have had today and that we've heard from the President is a discussion of how you are going to continue to implement past policies, and I don't call that a policy.



Quiet Colony

Buzz! Grate! Chugachuga!
Wheeze! Grind! Bark, bark, bark!
Honk! Roar!

Will space colonies be built with the acoustic environment of a New York subway? Although we joke about the racket of day-to-day life, there is evidence that it damages our hearing, health and peace of mind. And at least one person is already considering how to design space colonies that will sound as restful as a morning in the countryside. He's Robert Alex Baron of Citizens for a Quieter City, and he hopes to hear from others who share his interests. He can be reached at P.O. Box 796, Ansonia Station, New York, NY 10023.

*The following two pages may be copied and used for membership forms.

The New Space Program

by Philip K. Chapman

I encourage you to become more deeply involved in the national debate over the goals of the space program and its relevance to the present predicament of humankind.

I have given much thought to this subject, both while I was a scientist/astronaut and since leaving NASA, and I am convinced that our society must give a high priority to establishing industry off Earth, and then to permanent and growing settlements in space.

A movement is underway, in America and around the world, a movement of people who share these convictions. We need your ideas and your help.

A Turning Point

Even the opponents of the space program agree that we have arrived at one of the most crucial turning points in history: what we do, or fail to do, during the next few years can determine the fate of humanity for centuries to come.

If we choose challenge and achievement, the path which leads us out into the solar system, we can be pioneers in an unmatched era of physical, intellectual and cultural growth. But if we choose regression to a simpler life-style, we shall instead condemn our descendants to a deepening spiral of poverty and alienation and conflict in a dirty, crowded and decaying world.

The awesome choice is ours, and may not be postponed, for we must act while we in the advanced nations still retain a slim surplus of resources. If we do not create in our time a truly spacefaring society, then the opportunity may be lost in the grim turmoil which will mark the beginning of the new Dark Ages.

The Haves and the Have-Nots

The dilemma we face is simply stated. The appalling gap between the rich and the poor peoples of the world has finally become intolerable, not only because of the awakening conscience of the affluent

nations, but because the majority who live in conditions of brutal misery are no longer resigned to their fate.

Demands for equity are rapidly becoming more belligerent. The problem is that the revolution of rising expectations has coincided with the realization that this little planet cannot long supply the resources to maintain an acceptable standard of living even for those who now enjoy it, and that the planetary environment cannot long absorb the damage from sustained industrial growth.

Conservation vs. Growth

There are many now who will tell you that small is beautiful, that the problem can be solved if the greedy rich, and especially we Americans, will cut back consumption and adopt lives of voluntary simplicity, guided by the virtues of frugality and self-sufficiency.

In this view, our problems are a punishment for technological hubris, and we must recant if we are to be saved. Thus, it is a semi-religious prescription for the reformation of man rather than a practical policy to aid the starving in Asia and Africa.

True, our society has been wasteful in many ways and more careful husbandry of nature could actually improve our lives—but those who claim that major economic growth is unnecessary are either victims of illusion, denying simple arithmetic, or more interested in promoting ideological causes than in dealing with the crisis.

One statistic should be sufficient: the gross world product per capita is about \$900 per year, a factor of seven below U.S. levels. If we could distribute the world product more evenly, could you survive on one seventh of your present income?

Moreover, world population will inexorably double over the next several decades, with almost all the increase in the less developed countries. It should be clear that there are far too many poor for any practical redistribution of wealth to be more than a futile gesture, whatever the

ethical merits of such a program might be. However, the move towards social equity easily can and probably will erode the economic surplus of the affluent, thereby precluding the development of real solutions.

The Space Frontier

The human prospect is indeed bleak if expansion is impossible, if we must be limited to the terrestrial zero-sum game. Fortunately, space technology has advanced to the point where we can assert with confidence that this is not so.

There is no longer any doubt that the solar system is rich in energy, minerals and other resources, and only the adamantly uninformed can cling to the idea that they are inaccessible to us. The knowledgeable consensus is that the development of space resources is clearly technically feasible, but that it must be undertaken on a large scale in order to be economically justified.

With sufficient traffic to orbit, the costs of spaceflight can be reduced to levels comparable to airline operational costs. The complex of proposed projects now known as the New Space Program (which includes direct-broadcast television satellites, solar power satellites to end the energy crisis, permanent research facilities and factories in Earth orbit, lunar and asteroidal mining and long-term space habitation) can provide ample motivation for building a cheap space freighter.

The problem is that the initial funding needed for space industrialization is large by the standards of the private venture capital market. By Government standards, however, the funding level needed is quite modest, about equal to the receipts from cigarette taxes.

The New Space Program is the only viable means I know for sustaining economic growth indefinitely, which in turn provides the only hope that some day people everywhere may be fed and clothed and housed.

The immediate benefits from investment in such a program can include slowing of inflation, improvement in the

U.S. balance of payments, provision of exciting and meaningful jobs, and liberation of the human spirit from the defeatism now so prevalent.

In view of the promise, it is quite remarkable that these, the truly important uses of space, are currently receiving directly less than one percent of the NASA budget; and the whole NASA budget is less than one percent of the overall federal budget. I think these figures speak for themselves.

What You Can Do

If you agree with me about the significance of the New Space Program, if you would like to help get it moving, or if you just want to find out more about it, I have three suggestions for you:

1. Write to your representatives in Washington and urge them to support a vigorous, balanced, ambitious and well-funded space program.

2. Send me a postcard at the L-5 address telling me if you agree that expansion into space needs a much higher priority in our society. Feedback about these ideas is very helpful in itself and also because of its possible political impact.

3. Join the L-5 Society. This is a small but growing organization (there are over 3,000 members worldwide) which includes engineers, scientists, authors, members of Congress, business leaders and people from all walks of life. They are joined together by dedication to the proposition that our civilization must be allowed to grow, by rapid expansion into space, or else it will die.

I hope you will join with me, with Isaac Asimov and Robert Heinlein, with Senator Barry Goldwater and the other members of the society in direct participation in this, the most inspiring and significant venture of our time, or, perhaps, of any time in human history.

Life Support Workshop

By John M. Phillips,
Arizona Research Associates, Inc.

In early January, a workshop was held at NASA Ames Research Center which was concerned with the eventual need for life support system technology for large-scale, long-duration space missions. Entitled "Guiding the Development of Controlled Ecological Life Support Systems," the meeting focused on the need for a ground-based demonstrator facility to test such problems as ecosystem closure, food regeneration from wastes, and system safety, reliability and predictability.

Forty prominent scientists were assembled by workshop organizer, Dr. John Carden of the Georgia Institute of Technology, for three days of intensive deliberation. The participants were divided into six groups: human nutrition and food processing, food production, ecology, systems engineering and modeling, waste-processing, and a NASA overview group.

Each group was asked to consider the relevance of the ground-based demonstrator as a research tool for its discipline area. A consensus rapidly emerged that the demonstrator was a logical milestone in the development of life support systems for large space habitats. Ground-based research was judged more economical than going directly to experimentation in the space environment. Furthermore, the results of research in a ground-based facility could be applied readily to terrestrial problems.

Indeed, many of the experts pointed to the need for research of the kind required both to solve the life support problem for space travel and to address issues of major concern to science and society today. Intensive food production, recycling of

wastes, pollution monitoring and control, and the development of controlled ecosystem technology for human life support were among topics discussed as being highly relevant to the present needs of society and deserving of support for their terrestrial applications and benefits.

The possibility was raised that NASA may be able to work with other agencies which have a mandate to study and support research in some of these topic areas. If such liaisons could be developed, concerted effort could be brought to bear on the problem of the requirements for human life support.

This research question promises to be one of the most classical problems ever confronted by the scientific community and one that may emerge as a crucial study to ensure a meaningful future for human society.

The results of the Ames workshop on life support systems will be published shortly as a NASA technical memorandum which will summarize the research and technology development recommendations of the participants. Congratulations for an excellent and productive workshop are due the workshop organizers, John Carden, Bob and Betty Mason of Metrics, Inc. of Atlanta. Dr. Spurlock of the Georgia Institute of Technology served as the workshop chairman and led the workshop admirably.

It was my pleasure to have worked with these individuals as leader of the food production group. Additional details concerning the workshop's conclusions and recommendations will be provided in an article at a later date.



L-5 SOCIETY MEMBERSHIP FORM (please type or print)

NAME: _____

ADDRESS: _____

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AFFILIATION/TITLE OR POSITION _____
(OPTIONAL)

I am _____ am not _____ interested in being active locally. Phone (optional) _____
_____ Please enroll me as a member of L-5 Society (\$20 per year regular, \$15 per year for students). A check or money order is enclosed. (Membership includes the **L-5 News**, the monthly magazine of the L-5 Society. Subscription of \$12/year included in membership dues).

L-5 Society members who sign up for the Space Legislation Hot Line option receive frequent first class mailings on the actions of Congress and the President which affect the space shuttle, space colonies, solar power satellites, space exploration and other space projects.

_____ Sign me up for the Space Legislation Hot Line.

L-5 Society
1620 North Park Avenue
Tucson, AZ 85719

SKYLAB **B**

By Jennifer Atkins

Here it comes! A frightening 80 tons worth of spacecraft is getting ready to crash through the Earth's atmosphere. At \$2.5 billion, it will be the most expensive light show ever. But will that be all?

Experts say that when Skylab reenters the atmosphere red-hot chunks of debris up to two tons in weight could survive to hit the ground. They would be traveling at a speed of around 2,000 feet per second—not much slower than the velocity of a rifle bullet leaving the barrel.

And what does NASA say? Officials from the space agency are emphasizing that the odds of being hit by defunct space program hardware are less than those of being hit by a meteorite. Plus, Skylab spends 75 percent of its orbit over the oceans, which further reduces the possibility of it hitting any people. However, when it is not over water, Skylab flies over some of the most densely populated areas on Earth.

What Could Be Done?

The North American Interplanetary Society, a non-profit space oriented group based in Victoria, B.C., Canada, has launched a worldwide "Save Skylab" campaign. The campaign involves getting cooperation between the United States, the Soviet Union, and the United Nations for an international rescue effort.

The Soviets could boost Skylab into a higher orbit, using a Soyuz craft to rendezvous with Skylab. The docking would be no problem, thanks to the international docking adapter developed for the Apollo-Soyuz Project in July, 1975. The Soyuz craft, which normally rendezvous on a transponder, could be guided by mission control in Houston.

The North American Interplanetary Society proposes that the United States donate Skylab to the United Nations while the Soviets contribute their Soyuz and booster. When the rescue is accomplished, the United Nations would have moved into the realm of International Space with the acquisition of a habitable space platform, available for the use and benefit of all peoples of the world.

The Canadian government is being asked to forgive the \$6 million Cosmos 954 clean-up bill to the Soviet Union in return for Soviet participation in the rescue. The cancelled bill would be Canada's contribution to the campaign.

U.S. Cooperation

Angered at Soviet human rights violations, the Carter administration has opposed any activities (such as the Skylab rescue) which would allow the Soviets to obtain new technology from us. Also definitely a factor is the humiliation that our government thinks the nation would suffer having the Soviets bail out the number one space power in the world.

These attitudes help explain the

difference of opinions at NASA. High-echelon officials at the space agency have publicly announced that the Soyuz-Skylab rescue is not technically possible. However, lower-echelon employees at NASA, who are actually closer to the project, declare privately that the endeavor is perfectly feasible.

And so it goes. The people who could save Skylab seem to be just keeping their fingers crossed and saying that it *probably* won't hurt anything. As the space age becomes a reality, a precedent of international cooperation for emergency rescues would be an important asset. This type situation will inevitably reoccur. Unfortunately, it seems to take a disaster before people will begin to prepare for inevitable problems.



Apollo Commander Tom Stafford and Soyuz Commander Aleksey Leonov in the docking module during the 1975 rendezvous. This docking adapter could make possible a Soyuz rescue of Skylab.

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				<u>HEALTH EFFECTS OF MICROWAVES</u>							
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				28. November 1977 Health Aspects of Radio Frequency & Microwave Exposure, Vol. I							
				29. March 1978 Health Aspects of Radio Frequency & Microwave Exposure, Vol. II							
				30. December 1978 Biological Effects of Nonionizing Electromagnetic Radiation (A Digest of Current Literature)							
				31-35. Program Reports On: Control of Electromagnetic Pollution of the Environment:							
				31. June 1976							
				32. April 1975							
				33. May 1974							
				34. March 1973							
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<u>OTHER SPACE RELATED DOCUMENTS</u>											
				36-37. March 1977 Full Scale User Development Plan for the STS Pilot User Development Program							
				36. Volume I - Executive Summary							
				37. Volume II - Report							
				38. April 1975 The Economic Impact of NASA R&D Funding--Preliminary Executive Summary							
				39. Legislative Package: Full Text of:							
				1. FY 1980 NASA Authorization Act							
				2. Space Policy Act of 1979 (Senate Bill)							
				3. Space Industrialization Act of 1979 (House Bill)							
				40. 1977 Management of Interparty and Third Party Liability for Routine Space Shuttle Operations							
				41. 1978 Space Law for Business Planners							
				42. 1978 Report of the United Nations Committee on The Peaceful Uses of Outer Space (COPUOS)							
				43. 1978 Report of the COPUOS Legal Subcommittee							
				44. 1977 Report of the COPUOS Legal Subcommittee							
				45. National Aeronautics and Space Act of 1958 and Related Legislation as Amended through December 1978							
				46. November 1976 International Law--The Conduct of Armed Conflict and Air Operations							
				47. 1978 Legal Aspects of International Space Commerce							

NOTE: 1. 1-3 page Executive Summaries of any document can be ordered for \$1.50 each.

2. Microfiche copies are on 4"x6" diazo microfiche only.

Send *check* or *money order* to:

PASSIM Company, 3102 Beauchamp Street, Houston, Texas 77009.

International Satellite Industries, Inc. Launched

by Carolyn Henson

"I'm the President of Skydoggle, Inc. We're gonna build solar power satellites out of soda straws. Can you folks tell us who's working on that stuff, and where we can get some money?"

"My brother's wife and I have created the C.O.S.M.O.S. Foundation. We plan to build the first space cemetery. Send your contribution today! You are encouraged to leave a generous bequest in your will."

These are only slightly fictionalized versions of the letters and phone calls the L-5 Society has received from people who range from the merely naive to the frankly larcenous. Needless to say, you never hear of them in the **L-5 News**.

However, Christian O. Basler and the staging company concept are not strangers to these pages. (See "Do You Sincerely Want to Become Rich," **L-5 News**, Dec. '77.) So we greeted with delight the news that International Satellite Industries, Inc. (ISI) filed a registration statement on March 5, 1979 with the Securities and Exchange Commission. That means we can finally report on ISI's progress without incurring the Securities and Exchange Commission's wrath!

ISI started out as a purely academic idea. Christian O. Basler, a lawyer formerly with Western Electric, presented a paper on the staging company concept at the Industrialization of Space Conference in San Francisco in Oct. 1977. Encouraged by the response he got, Basler incorporated ISI last August and plans to be selling stock by this July.

According to its prospectus, ISI intends nothing less than "...eventually to construct and sell solar power satellites..."

Why does ISI rush in where the big aerospace companies fear to tread? First, the "rush" may well be 20 years. Secondly, as a staging company ISI first accumulates capital by investing the money it receives from sales of its stock. Only the dividends and interest from its investments will be spent on power satellite research and development.

When the ISI feels it has enough of a handle on the task to make a profit building powersats, it will convert to an operating company. ISI will liquidate its investment portfolio and take out loans as needed and pour the money into construction.

That assumes, of course, that a myriad of

Who's Behind ISI?

Who are the people who put together International Satellite Industries, Inc.? Foremost is ISI President Christian O. Basler, formerly a lawyer for Western Electric, Basler is also a member of the ISI Board of Directors.

The other ISI directors are: Philip K. Chapman, a former scientist/astronaut; currently he is solar power satellite researcher for Arthur D. Little, Inc. Edward R. Finch, a top international aerospace lawyer. H. Keith Henson, president of Analog Precision, Inc. and co-

founder of the L-5 Society.

Ralph H. Nansen, Manager, Space Solar Power Systems, Ballistic Missiles and Space Division, Boeing Aerospace Co.

Brian T. O'Leary, former scientist/astronaut, currently an extraterrestrial resources researcher at Princeton University.

Edward V. B. Stearns, Program Manager, Space Systems Division, Lockheed Missiles and Space Co., Inc., and Executive Vice President of the American Astronautical Society.

pitfalls can be avoided. What if powersat electricity can't compete? If the vast amounts of money can't be raised? What if the U. S. or another government or another private company start to build solar power satellites first? The fallback position, if things look hopeless, is to liquidate ISI and distribute the assets to the stockholders. Due to the financially conservative nature of an investment company, the odds are fairly good the disappointed stockholders would get back most of what they put in.

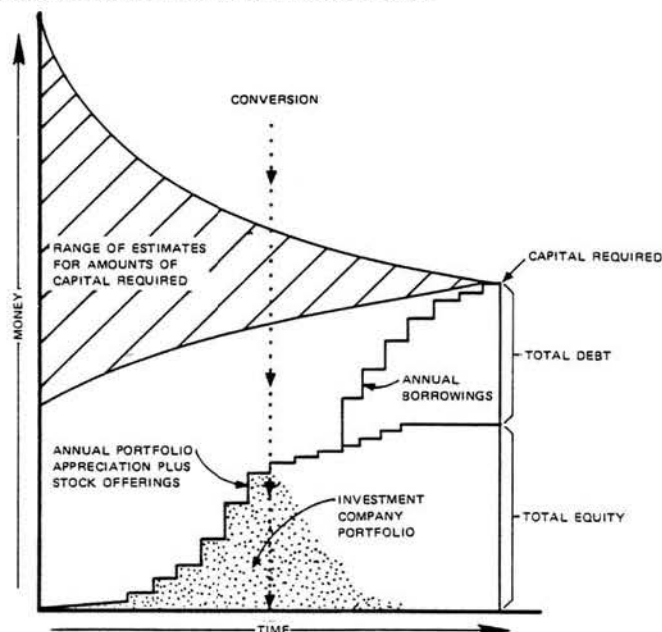
Stock in ISI is not for those who need a dividend income. ISI has no intentions of

declaring dividends until some years after it becomes an operating company.

However, the adventurous may take an interest in a section of the ISI prospectus reading "...the Company may give preference in its hiring of space workers to holders of the Company's Common Stock."

The address of ISI is:

Christian O. Basler
ISI
250 W. 94th St.
New York, N.Y. 10025



Of Interest:

Register Now for Princeton Conference

by Carolyn Henson

Planning to attend the Princeton Space Manufacturing Conference May 14-17, 1979? According to Barbara Evans of the Space Studies Institute you'd better write in early and give reasons why you should be allowed to attend. Conference space is limited and only the "top applicants" will be able to make it. (Last time they turned away so many people they didn't fill it up.)

To squeeze in, write to:

Bill O'Brian
Princeton Conference Office
5 Ivy Lane
Princeton, N. J. 08540
(609) 452-3371.

If the Princeton people give you thumbs down, don't despair. They have magnanimously provided a session open to the public the morning of May 17. For details, contact the Princeton Conference Office.

Following the public session there will be an afternoon party for Space Studies Institute subscribers. SSI, one of the

conference sponsors, can be joined by sending \$10 or more to Box 82, Princeton, N. J. 08540. SSI funds research by Princeton physics professor G. K. O'Neill.

If you object to closed conferences, there are several courses of action available.

First, you can ignore the darn things and only patronize open conferences. We will run notices in the L-5 News as these conferences come up. Two good ones to watch for are the annual meeting of the American Astronautical Society next fall and the annual meeting of the American Institute of Aeronautics and Astronautics next winter.

Second, you can write to G. K. O'Neill at the Space Studies Institute. O'Neill was responsible for holding two open conferences on space manufacturing before his advisors sold him, in 1977, on the closed conference concept. Perhaps, armed with your letters, he will once again stand up for an open conference.

Errata

We gave the wrong zip code for the Niagara Frontier L-5 Society. The correct address is 40 Kings Trail, Williamsville, New York 14221.

In the January issue we listed the author of *High Justice* as Terry Pournelle. The author is, of course, the well-known author Jerry Pournelle. His book, *High Justice*, is a collection of stories, not a novel.

In the February issue the intrepid L-5er who helped at the AAAS convention is Bob Nichols, not Mike Nichols.

Also in February, the wonderful article entitled "Developing Hardware to Support Life on Long-Term Space Missions" was written by Kay Ebeling. She is Editor of the NASA Johnson Space Center *Roundup*.

L-5, c/o Peter Goldie
424 Taylor Street
Bethlehem, PA 18015
(215) 691-6805

Detroit L-5

Greater Detroit Metropolitan area now has its own local chapter of the L-5 Society. We are currently involved in developing a presentation based on the L-5 Slide Show, which we intend to use to popularize the L-5 concept in our area.

We are actively looking for new members.

We can be contacted at: L-5 Society for Space Colonization, c/o B. L. Short, 626 Longford, Rochester, Michigan 48063.

Letters

By now you at L-5 News have probably heard about Dr. John Rather's new SPS proposal: sun-pumped laser powersats. My source is *The Foundation Commercial Space Report* of Nov. 1. In case you don't have the information on hand yet, here is the gist of the new idea.

Sunlight is collected by a mirror and brought to focus on a laser apparatus. The laser is excited by the incoherent sunlight and produces an infrared laser beam. The laser beam is modified and reflected by a second mirror and received on Earth. Optical collectors on the Earth can divert the heat beam directly to boilers in the steam cycle of conventional powerplants. The sun-pumped laser powersat may be small in size and produce about 100 megawatts of energy. Such energy in small concentrated doses from space could be used directly by industrial consumers or small utilities. Because of the small size of the powersat, the benefits of competition among several powersat manufacturers should accrue; massive government support and regulation could be avoided.

The sun-pumped laser powersat has obvious advantages and disadvantages but overall seems preferable to the microwave powersat. Both systems may find a niche in the future scheme of things.

Finally, let me express my opinion that we should make our case with the people, not with the politicians. Most politicians are not leaders but followers; they follow public opinion polls and media hype. I don't want tax money

building powersats and federal bureaucracy suffocating space development with regulations. The high frontier is a concept whose time has not only come but is many years overdue. The arguments in its favor are overwhelming. If you can't sell this future full of hope to a world starving for energy and freedom, than you can't sell air conditioners in Florida. Simply raise your voices, humbly but persistently, and you will be heard.

*Warren Merkey
Gainesville, Florida*

As of January we opened our doors as a new public education center, a growth center, on the ocean at Half Moon Bay, on the coast of the San Francisco Bay Area.

Until this last month, I have been a member of the L-5 Society, and I would like very much to promote awareness of L-5. To do a worthwhile presentation demands the slides, though, which we do not have, and we would like to invite an outside guest speaker to do a public presentation on L-5 which we would publicize.

Could you pass the word to the potential speakers and slide-showers of Northern Calif., that our Center would like to promote such a show? This will be small scale, in that we are a new center, and for such an event will probably only draw from the local area, which is not large, but I anticipate speakers working for the love, not volume, of it.

The admission charge would have to be small, to attract people, and any such charge could be split 50-50 between the speaker and our Center for our arrangement of the event.

Please pass on this offer to whom it may concern.

Thank you.

*Jun
P.O. Box 1058
Half Moon Bay, CA 94019
(415) 726-7159 or 726-7635*

I note with satisfaction that James Abourezk did not seek reelection to the senate this year. However righteous he believes himself to be, he may be serving the interests of his country better by relinquishing power. For this I thank him. I hope that his South Dakota home is one day powered by solar energy from space.

*Gale M. Smith
Auberry, CA*

I hope that you might be able to help me get the word out to people who would be interested in the most fantastic class on Outer Space that has ever been given.

This summer, for the second time, Dr. B.J. Bluth will present her class "Man's Move Up to the High Frontier—The Industrialization and Settlement of Space". It will be given at the California State University, Northridge, Ca. from June 25 to August 3. It is an advanced sociology class and can be taken for credit or audited. The class was from 9:30 to 11:00 daily, and will be again. However, the classes lasted well into the afternoon many times. When Dr. Krafft Ehrlicke spoke, we had trouble letting him leave at 3:30 to catch his plane. The outstanding speakers were a real "Who's Who in the Space World". I'm sure many of your readers would be interested and appreciate the opportunity to hear about this most outstanding class. Quite a few of us will be attending for the second time.

I've been a happy member of L-5 several years now and really appreciate the way your magazine has grown. I'm enclosing a picture of my license plate. The L-5 euphoria leaves quite a few people a bit confused. However, my future studies students are well aware of the meaning.

*Shelley O. Pearson
Coordinator
Mentally Gifted Minor Program
Social Studies Dept.
John F. Kennedy High School
Granada Hills, CA*



Our problem in the L-5 Society is that we are unwittingly trying to bludgeon the Congress and the Ameri-

can populace into quickly accepting a massive and expensive SPS concept. This seems to be in the direct opposite direction of current public sentiment which favors of decentralization of energy resources. If we approach this problem with the idea of pushing a much less expensive junk collection and reprocessing plant we could much more easily convince Congress and the public that there could soon be a large and far less expensive buildup of material in orbit, in which to carry on the building of large space structures.

I believe that a combination of satellite reclamation and re-processing, and the subsequent manufacture of an asteroid-capturing mass-driver or ion-powered space tug could be the fastest, easiest, and least expensive way to help solve our energy woes and turn a large profit. If carbonaceous chondrite asteroids could be easily brought back to earth orbit, they could be the ultimate mineral resource.

I think the L-5 Society should avidly go after NASA support for a space junk reclamation and remanufacturing plant.

*James Frobein
Salina, Kansas*

The American Experimental Spaceflight Association has announced a "Peacestar" small satellite project. The satellite will carry one passive experiment, be about the size of a soda can and weigh about 2 pounds. It may carry a tracking beacon and would be launched "Piggyback" by a large booster. Attempts to arrange payload space on both NASA Space Shuttle and the ESA Ariane launcher are in progress.

The first mission (one of ten planned) is called "Peacestar" since it underscores the community of humanity. It will carry small desk sizes of the flags of all nations and thereby be symbolic of the family of man and the peaceful uses of space.

Contributors of \$10 or more to the Peacestar project will be placed on the space honor roll to be launched with the satellite. Project director, Paul Geyer, is an L-5 member, a former astronaut candidate and lunar module safety engineer.

Mr. Geyer would be pleased to represent the AESA at conferences and offers a speaker service. Interested persons may contact Paul Geyer, c/o AESA, 230 E. Grand Ave., Rahway, N.J. 07065.

*Sincerely,
Paul Geyer*