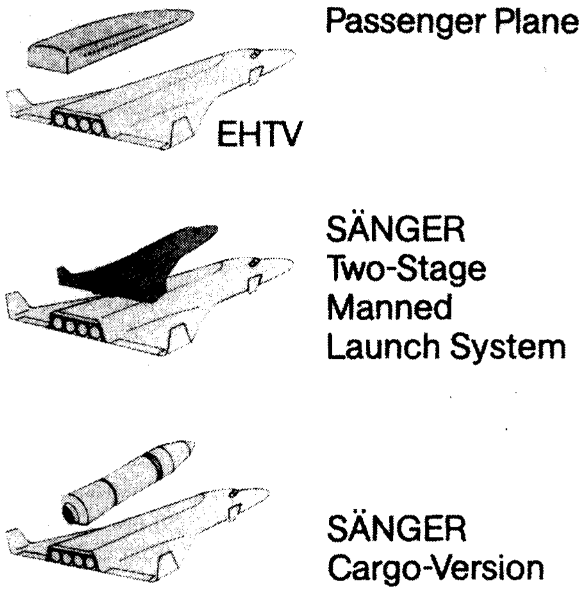

Three versions of the Sänger concept. Germany's Fusion Energy Forum proposes building an unmanned demonstrator with an air-breathing engine.

Competent decision-making is key

The excellent progress in development work so far, has brought the Sänger Project to the point where crucial decisions must be made soon. One of the most important issues concerns the choice of flight demonstrator vehicles, which are required for both stages.

The Hermes vehicle, under advanced development as a European Space Agency project, fulfills most of the requirements for a demonstrator for the Sänger second stage. Hermes will demonstrate know-how and systems for manned space flight, orbital maneuvering, hypersonic reentry, and aerodynamic landing. Hermes lacks only a propulsion system. However, the high-performance LOX/LH engine of the Sänger second stage is a relatively straightforward development of known technology.

For the lower stage of Sänger, a manned demonstrator vehicle called "HYTEX" has been defined. This would be an air-breathing, manned transsonic vehicle for speeds up to Mach 5-6. But, a decision to build a manned demonstrator for the first stage would lead to major problems. It would require a program of several billion dollars and could only be realized through a complex international effort. It would exacerbate the budget problems of existing programs, which have no room for an additional, parallel program of such magnitude.

Fortunately, there is a workable alternative: Instead of an expensive manned vehicle, it would be sufficient to build an unmanned, guided vehicle with an air-breathing engine. Such an unmanned demonstrator vehicle would demonstrate most, if not practically all, of the needed technology, including:

1) aerodynamics up to stage separation at Mach 7;
2) stage separation at Mach 7;
3) structure and airframe design;
4) air-breathing engine for velocities of 0 to Mach 7;
5) navigation, guidance, and control.

An unmanned, guided demonstrator would have multiple advantages. First, it would cost only around $437 million, rather than several billions of dollars—an order of magnitude less than a manned version. Second, as an unmanned vehicle it would involve much lower risk. It would have more manageable physical dimensions. And finally, it would involve much simpler program management, avoiding having to start-up a complex multinational program at this stage of the Sänger Project.

Wisdom would dictate opting for an unmanned demonstrator. Unfortunately, there is a danger that extraneous pressures—not least of all the desire of some firms to get in on large, lucrative programs—might lead to a wrong decision that would endanger the long-term future of the whole project.

In this context it must be emphasized: Development of space flight is not a gap-filler for ambitious, but handicapped military aircraft manufacturers starved for big contracts.

Sometimes, somewhat less is more! Rushing into an oversized program too early hampers progress more than it helps.

In the interest of the future of manned space exploration, care should be taken to insure competent decision-making for the Sänger Project. With a sensible level of financial support and protection from extraneous pressures, this space transport system could be flying by 2010.

LaRouche Platform

1988 campaign called for Sänger Project

During Lyndon LaRouche's 1988 Democratic presidential primary campaign in New Hampshire, he addressed 500 students at Manchester's Memorial High School, most of whom could not then, but can now, vote. The following is excerpted from his Feb. 5, 1988 address.

Now, my problem is this: As President, my job is to do everything government should do to ensure that U.S. industry has the most advanced technology in the world available to it, as rapidly as possible. There are two sides to this: One side is to make the technologies available; the other side is to make sure we are supplying cheap credit, and investment tax credit incentives, to make sure these technologies are used.

My problem is: Knowing what the areas are in which scientific progress will be determined in the next 50 years, how could I put all of this in one package, so that—in terms of international cooperation among governments, with our government, and in cooperation between the private and public sector—how could we be sure, that we would be generating these technologies as rapidly as we need them?

So, back some years ago, back in 1985, I had the occasion, at an international conference in Virginia, to present a paper in honor of one of the United States' space pioneers, a friend of mine, Krafft Ehricke—he died a year earlier. And Krafft, among his many projects, developed the industrialization of the Moon project for the United States—for NASA, and for General Dynamics, and others. And, so I thought it was appropriate, because Krafft had always wanted to do that, to define our exploration of Mars, which is what the immediate objective of exploring the Moon is: to get a stepping-stone to Mars, and beyond.

So, I defined a Moon-Mars colonization, industrialization project, to accomplish the mission of establishing a permanent, manned colony on Mars beginning the year 2027. The President's Space Commission, about 12 months later, made exactly the same general proposals, but proposing somewhat different specific goals and objectives, but also selected in the year 2027, as the target year for the beginning of the permanent colonization of Mars. Just the same way that President Kennedy proposed the end of the 1960s, as the date for man landing on the Moon—we reached it.

Starting colonies on Mars in the year 2027—from today—is just as feasible as putting a man on the Moon, in the course of the 1960s. It's just a bigger project, more long-range, but exactly the same method of approach, and the same kinds of benefits.

I'll give you a couple of examples of what this means. I'll give you another shock, but those of you who are studying physics, or something like that, can work this out for yourselves.

I don't like the idea of human beings traveling around a long time in space, at microgravities, or fractional gravities, and, since we have not determined yet the effect of keeping human beings in these conditions for extended periods—though we know they're dangerous. I say, all right, let's do the smart thing! In traveling between Earth orbit and Mars orbit, let's go at a constant acceleration of one gravity. That would mean, and you can figure it out for yourselves, that one gravity of constant acceleration, or deceleration on the downside of the trip, means that the average time to move from the orbit of the Earth, to the orbit of Mars, will be *two days*.

Now, the question is, how do you get up there? This will use a unit which will have 1 terawatt fusion power propulsion. It's a system on which we're already working. Now, how do we get up there, from Earth? Well, the Shuttle is not a good idea. Krafft Ehricke and others opposed the Shuttle back in the early 1970s, not because it doesn't work, but for two reasons: First of all, it's too dangerous. There's nothing you can do to eliminate the fact that these things are dangerous—that is a big bomb, those rockets, each one of them. Secondly, it costs too much. The cost of getting a pound of payload into space is too much. And, we already knew at the end of the 1960s how to build a better system. But, the way the government works, they say, "Well, let's go with the practical thing we've got on the table now, instead of building something better!" And that was a big mistake, and always is a mistake on the part of government. When politicians start talking about being practical, hold on to your wallets!

Instead, we develop what's called the Sänger Project. Sänger was another famous space scientist, and the design was as follows: We can build a special kind of jet, it's called a scramjet. A scramjet is about the size of a Boeing 707, and takes off like an ordinary airplane. It gets up to about 150,000 feet, and is hitting then, a speed of eight times the speed of sound. It goes up a bit further, and out from underneath that scramjet comes off a shuttle-craft—a rocket shuttle-craft—which goes up to what's called low orbiting position. And, in low orbiting position, we build a low-orbiting space station. We assemble parts at the low-orbiting space station, we build space tugs, then, out to 22,000 miles, approximately—geostationary orbit—and there we begin to build, by these shuttle trips, a permanent space terminal. From that, we move into moving to the Moon—this time, to industrialize it. . . .

Remember that the problem with the rocket is, the major component of weight of fuel of a rocket is oxygen, using oxygen to push up through the atmosphere. What's in the atmosphere? Oxygen! Why do you have to carry oxygen through the atmosphere? Use an aeronautic principle, and get above the atmosphere by these methods, and you have a tremendous saving in cost.

Then, we get to the industrialization of the Moon; we produce most of the weight on the Moon. Spacecraft for travel to Mars will involve about 200 passengers each, flying in flotillas of five, taking an average trip of two days or so, to get there. The freight we require on Mars will go in large ships, powered by the same 1 terawatt propulsion system, which will be the size of supertankers. They will carry the freight, they'll be unmanned; with that, we will simply put into place the materials to build the first controlled Earth-like environment on the surface of Mars, and that begins colonization.

Now, this means that for you, a higher percentage of you than during the past 20 years will be going into science and engineering. This means that the teachers of the future, of the next generation, will be preparing to teach classicial subjects, with an emphasis even greater than that which was characteristic of schools back before 1968, and 1963. This means that where New Math has been the curriculum today, it will be junked, and we will go back to geometry, especially projective, and other synthetic geometry—constructive geometry.

It means that the study of the classics, the study of tragedy, the study of literature, will be at a premium. It means that tests which are based upon multiple-choice questions, will no longer be considered qualifying tests for diploma credits, that you have to be able to write an essay, which is competent and literate on the subject on which you are asked a question, as part of your testing, to prove that you can *think,* and project your mind in a coherent way. You don't have to think perfectly, but you should be able to think.

We will need teachers, scientists, engineers, and people who will go into factories, as operatives, not like the old shoe factories, and so forth, we have here, but to work on new kinds of jobs, which will be technologically, at the level of engineering employment today. And that's your future. I don't think you'd like to think about any other. . . .

The 'Woman on Mars' broadcast

On March 3, 1988, LaRouche produced a half-hour national broadcast, "The Woman on Mars," for his campaign, regarding his program for a Mars colonization effort as a science driver. What follows is excerpted from LaRouche's script for the broadcast.

Announcer #1: "Are you there, Dr. Gomez?"

Woman's voice: "Yes, John. I have the announcement for which you have been waiting. As of five minutes ago, our environmental systems were fully stabilized. Man's first permanent colony on Mars is now completely operational."

Announcer #2: If Lyndon LaRouche becomes President next January, that message from Mars will actually occur 39 years from now. The woman who will speak from Mars was born somewhere in the United States within the past year or two.

LaRouche: Many of you are shocked. Some of you are saying, "Why is this old geezer talking about a permanent colony on Mars, 39 years from now, with the major budget problems in Washington today?" . . .

As some of you know, my specialty is a branch of science founded by Leibniz, called physical economy. Over the years, my associates and I have had the privilege of working with some of the world's leading scientists in plasma physics, optical biophysics, and space technology. What I have done, is to put this scientific knowledge together with my own expertise in physical economy, just as I did back in 1982 when I proposed what became known as the SDI. I have also consulted with some leading organizations in Europe which are already prepared to go to work on some aspects of a Mars colonization program. . . .

We need something which could be made operational in a few years. So, I traveled to West Germany, to the leading aerospace firm MBB, with which my friends and I had had contact in connection with proposing the development of a Western European version of the SDI. MBB is prepared to proceed with a design which was already proposed as the alternative to our shuttle system back at the beginning of the 1970s. It is called the Sänger Project, named after the leading space-scientist who developed it. I propose that our aerospace firms cooperate with the Europeans and Japan in accomplishing this.

The Sänger system has two elements. One of the elements is what is called a scramjet. The other is a rocket-plane, a replacement for the shuttle-craft, which is piggybacked on the scramjet. The scramjet takes off with the shuttle attached, reaching about eight times the speed of sound at an altitude of about 150,000 feet. At the top of its flight, the scramjet releases the shuttle which flies on its own power into low Earth orbit. This scramjet has obvious civilian as well as potential military uses. Potentially, it cuts the cost of getting a ton of payload into space by as much as 90%. . . .

My friends in Italy's aerospace industry came up with an improved design for such a scramjet configuration. This is the proposed design, which has many aeronautical advantages, including the ability to take off from ordinary airfields. One of the reasons for the curious shape, is that our Italian friends have used what is called the "Busemann biplane principle," to lessen the drag. . . .

First, there are powerful reasons we must have a colony on Mars. To achieve certain very specific kinds of scientific breakthroughs we shall need on Earth, we must do the kind of astrophysical research we can not do without a Mars project. . . . The practical purpose is to build up a system of giant radio-telescopes as far away from the Sun as possible. To sustain the scientists and engineers working on these space laboratories, we need a nearby logistical base. To support those scientists and engineers requires a population about the size of a medium-sized city on Earth. Since Mars is the nearest location which meets the requirements, we must colonize Mars. . . .

The second reason is that the Mars project uses every frontier technology we might expect to develop during the coming fifty years of scientific research. That means, that the space program would be supplying our civilian industries with the most advanced technologies possible at the most rapid rate, putting the United States permanently in first place in technology. . . .

It means a much better way to live, than the drab misery, illiteracy, and decay, into which our nation has been drifting the past 20 years.

Then, 39 years from now, we shall hear the broadcast from Mars, announcing that the first permanent colony there is operational. Among those colonists will be some of the children and grandchildren of you watching this broadcast tonight. Many of you will be watching that first television broadcast from the new colony.

Already, the woman who will speak to you from Mars, has just recently been born somewhere in the United States.

We shall give our nation once again that great future which our children and grandchildren deserve.