Interview: Fred Ferguson

The Magnus Aerospace plan for a heavy-lift dirigible

Mr. Ferguson is the president of Magnus Aerospace Corporation, in Ottawa, Canada. He was interviewed by David Cherry on March 24.

EIR: You're at the stage where you must scale up, and you're looking for funds to do that. What is the best current prospect?

Ferguson: We will be raising money—the major funding we expect—by way of a public stock issue in about six to eight months. We will be keeping the project here in Canada and will have the advantage of certain forms of government assistance in bringing manufacturing on line in a high unemployment area in the eastern part of Canada.

EIR: Do you have a town or site selected?

Ferguson: We have a proposed site for the manufacturing in the Cape Breton region, which is the northern part of Nova Scotia.

EIR: Are the logging companies still interested?

Ferguson: Yes. I'm not sure that I would consider them a prime target market, but yes. The economics of logging varies, depending on whether lumber is selling at high or low prices. That's what makes logging a prime target or not. So we see the target markets as being more in the transportation of expensive or heavy equipment and supplies to northern and off-road areas, the erecting of buildings, transmission towers, and pipeline. The James Bay hydroelectric project could have made very good use of this vehicle. If you have to move transformers or D-9 tractors, it is ideal.

EIR: The Fusion Energy Foundation has proposed the development of Africa on a crash basis. Could you comment on the applicability of your craft to that purpose?

Ferguson: We have letters on file from the heads of some countries in Africa. They wrote asking if we could get them a craft. This goes back about three years. We have also had a number of consultations with some of the major aid groups for Africa, concerning the supply of wheat and foodstuffs to the interior. The nice thing about the craft is that it operates at a very low cost per ton mile.

We have not commenced taking orders for the craft. Our business plan at the moment is to bring in a major aerospace group such as Westland in England [parent company of British Hovercraft—ed.], and form a working agreement with them. We're arranging all the financing here.

EIR: Has the Canadian government shown an interest? Have government departments come to see you or come to see trials of your scale-model craft?

Ferguson: Yes, they have. For example, the Department of Regional and Industrial Expansion (DRIE). We're working closely with them. Also the Transport Department has been keeping an interested eye on the whole program. The Air Industries Association of Canada—a lobbying body including everything from Pratt and Whitney to De Havilland—had enough faith in this as a project to have voted me in as a director and committee chairman.

EIR: What about Canadian defense?

Ferguson: I think Canadian defense is interested, but not as interested as the U.S. The U.S. military has shown a keen interest over the last three years. They would be the prime market.

The Army, for example, has shown an interest mainly because our craft will lift the new M1 tank that weighs 60 tons, and the Army has only one aircraft, as I understand, that can transport that tank [the Lockheed C-5A—ed.]. And aircraft require runways. I wouldn't consider our craft to be something you'd want too close to the front lines, although its radar image is minimal because of the amount of composite involved. It's more appropriate to long haul, and getting equipment to localized action. Now, the payload range of our craft starts at more than 50 tons net payload, and the flight range is up to approximately 1,000 miles given full net payload. And we can achieve much longer ranges by cutting back the payload.

The craft also has modular design, so you can change the size of the power plants, and they can be broken down for servicing. The craft is designed to respond easily to varying

mission requirements. In other words, there are a lot of modular options, something like the F-64 Skycrane helicopter. It is designed not to require hangars. And I think all of that's of real interest to the military. The 60-ton craft has a 180-foot-diameter sphere. We can go up to about twice that size given today's technology. This is off-the-shelf development, using standard aircraft fabrication techniques. We could actually go into production at about twice that size, at 360 feet, and at that size we could be achieving roughly 400 to 500 tons net payload.

Unlike a blimp, it handles exactly like a helicopter. It has the same hover capability and vertical take-off and landing performance.

EIR: What is the handling problem with the blimp?
Ferguson: The difference between what we have and a blimp is the difference between a tugboat and a sailboat, or a motorboat and a sailboat. A blimp is more of a sail-like vehicle. A blimp will not maintain a true hover. People say they hover; what they're really doing is maintaining a general position over the ground into a headwind, the same as a sailboat. That is best called "station-keeping."

True hover or "precision hover" refers to the ability to turn through 360° while holding a position within standard, specified limits. Helicopters do this. Precision hover is necessary for landing, docking, and unloading, without any ground crew involved in maintaining the craft's position. Our craft meets the standards of precision hover. The spherical shape—giving it the same exposure from every direction—and the powerful turboprop engines achieve this.

What we have under development is a very powerful craft that has controlled movement in all three axes similar to a helicopter. This may not be all that important when it comes to dropping off food, but it's important when you run into difficult weather, and when it comes to tasks such as placing transmission towers and logging operations.

EIR: In your design, until the sphere starts to rotate, the craft is slightly heavier than air—is that correct?
Ferguson: No. The rotation of the sphere doesn't assist lift-off. Rotation doesn't come into play until you go into forward motion. To lift off, you go from negative to positive buoyancy by way of an internal spherical bladder or ballonet, but it's a pressurized one, as opposed to the normal kind you usually have on blimps. We can pump air into that bladder, which reduces the volume of the helium through compression and increases the air weight within the bladder, and that provides quite a latitude in gross buoyancy. It's something like the air bladder of a fish that the fish uses to go up or go down.

The crucial problem with blimps and dirigibles—the reason you don't see them flying around now—is that they have no structural integrity. Supposedly the flammability of hydrogen spelled the end of the dirigible era. It's not true. Hydrogen is flammable, though not all that explosive. But I don't think it burns any worse than the swimming pool full of fuel in a Boeing 747. The outcry over hydrogen flammability in the 1930s was off base. Hydrogen did have the advantage of twice the lifting power of helium.

The real reason for the demise of the dirigible was the lack of structural integrity. We address that problem by using the sphere, which offers the smallest surface area for the given volume. The spherical shape makes the craft pretty close to structurally perfect. So we don't see a structural problem. Now, a blimp gets around those problems because it yields. It absorbs the stress and strain. But blimps have a limitation in size to about five tons net payload. That's why you don't see large blimps. Above that limit, blimps tend to simply bend in half. Imagine a child's helium balloon in a long sausage shape. Hold it in the middle, and the two ends will go up. That gives you an idea of what a large blimp does in response to any force from the outside.

EIR: How does the rotation of the sphere generate lift?
Ferguson: The back-wheel rotation of the sphere creates an effect exactly the same as the passage of air over the airplane wing. It reduces the air pressure going over the top of the sphere. The actual rotation of the sphere doesn't take very much energy—about 180 horsepower to achieve the properties that allow for 40 tons of lift. Keep in mind, there is 14,000 horsepower pushing the sphere forward. The speed of rotation of the sphere is proportional to the speed of the craft. Imagine a 180-foot sphere rotating on a craft that is traveling 60 miles per hour—rotation will amount to about 3 or 4 rpm to achieve surface velocity of 60 mph.

EIR: Do you have ideas in the works other than the heavy-lift dirigible?
Ferguson: There are a number of areas and projects. There's a solar electro-converter for which the engineering evaluation is complete. I have not had time to have a prototype built, but I believe we will be able to convert solar energy on a mass-produced item that will sell for less than $1 capital cost per watt. That compares favorably to what is normally $4 or $5 per watt. That is, a $2,000 unit will basically provide you with 2,000 watts under conditions of bright sunlight.

EIR: What is your own background in aerospace and engineering?
Ferguson: I have neither. My original background was in design. I always had a love for technology. I wanted to get out and see what I could do with it. I had no particular romantic interest in blimps and dirigibles. I realized in 1978 that there was a very large market where governments and companies were seeking to utilize helium that was a by-product of natural gas.