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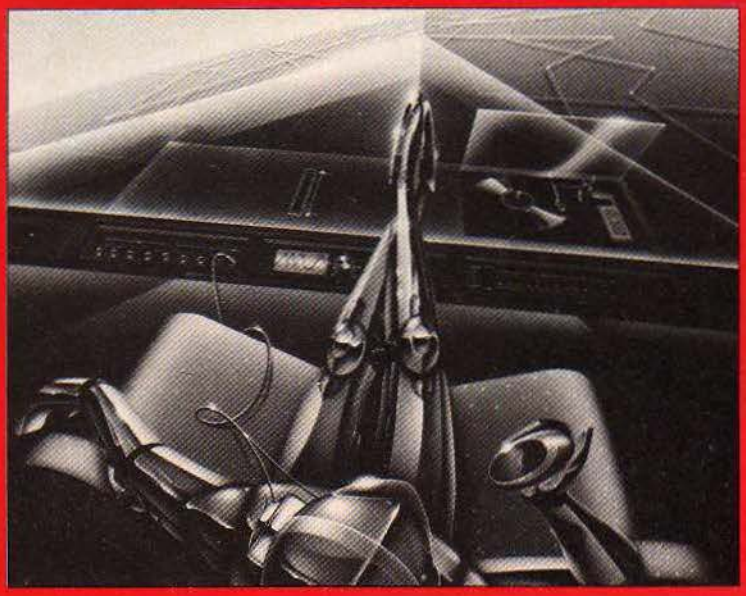
"Any starship that used this braking system would leave long, hot trails in space."

ANTI MATTER



UFO UPDATE

When the E.T.'s finally arrive in our stellar neighborhood, how will we know they're here? One way, suggests noted Princeton University physicist Freeman Dyson, is to look for the skid marks formed as the spacecraft comes to a halt.

Putting the brakes on a starship moving at, say, half the speed of light is no mean feat, says Dyson in the book *Extraterrestrials: Where Are They?* (Pergamon). In fact, Dyson knows of only one way that braking from near-light velocities might be accomplished. This braking system would make use of a phenomenon known as Alfven drag. Accidentally discovered by Nobel laureate Hannes Alfven when the *Echo 1* satellite experienced a slowdown in space 50 times greater than what had been expected, Alfven drag turned out to be the result of an electromagnetic interaction between the satellite itself and magnetically charged "plasmas," or gases, in space. It's something like playing marbles with magnets: If you shoot one magnet past another, the second magnet's pull is going to slow down the first one.

The concept does have one problem: Calculations show that a spaceship would have to have enormous surface area in order to catch enough of the plasma energy for braking purposes. But Dyson has a way around this problem. The braking system itself, he says, need not be a contiguous mass, but could be composed of long, thin wires with spaces in between. The wires themselves would catch and carry the current from the plasma and use it to slow down the craft. Dyson thinks that a network of wires one micron in diameter, spaced ten meters apart, would work.

No one has yet proved that an Alfven drag system is in fact possible, Dyson adds. "But it ought to be a simple problem for a graduate student to solve. I hope that someone will take it up before too long."

According to Dyson, any starship that used this braking system would leave long, straight trails of hot plasma in space—thus the skid marks—and these, in turn, would send out signals that could be detected by radio telescopes on Earth. The skid marks created by Alfven drag, then, could actually provide a surprisingly mundane lead for all those radio astronomers who are diligently combing the skies for signs of extraterrestrial Vasco da Gamas.

So far, no such skid marks have shown up, perhaps because the radio astronomers involved in SETI (Search for Extraterrestrial Intelligence) have not been looking for them. "I wouldn't expect them to be carrying on a dedicated search for the marks," says Dyson. "It's like everything else in the SETI business—you make a hundred suggestions and perhaps one of them will turn up. Radio astronomers are always making up maps of the sky; so if one of them ever does see anything like this, he should call attention to it."

Has the lack of evidence for skid marks made Dyson pessimistic about interstellar travel by another species? "Not in the slightest," he replies. "I think it's quite likely that there are other species exploring space. There's no evidence for it, but there's no evidence against it either. The most interesting thing," the physicist maintains, "is to keep devising ways of conducting the search."—*BILL LAWREN*