LETTER FROM FRANKFURT

Bitter about VTOL

The German Government has dropped support of a pioneering effort

by Ted Shoemaker

Planes that take off and land vertically have been in the works for almost two decades. The advantages, both military and civilian, for such a plane are obvious, but the price in fuel consumption and weight has been hard to overcome. Only one VTOL, the British Harrier, is operational.

Germany has been for years among the leaders in VTOL research. But now work has been cut off, and there is ill feeling between Germany's aircraft industry and the budget-makers in Bonn.

Work has been under way since 1957, with the military picking up most of the estimated $650 million tab. But the defense planners have concluded that the plane did not jibe with current military needs. Virtually all financial support was withdrawn from four different projects.

The result has been the laying off of about a seventh of the nation's 8,500 aircraft workers. Industry chiefs claim that a precious technological lead, not to mention a huge sum of money, is being allowed to go down the drain.

There is a lot of national pride involved. Germany once was an aerospace pioneer, developing the zeppelin, the V-2 rocket and the first successful jet plane. More recently it has been left in the dust; it wasn't allowed to have any aircraft industry at all between 1945 and 1955. The aircraft people saw in the VTOL a means of recouping some of that lost prestige.

There is little question that a practical VTOL would find an important role in aviation. It would be particularly useful in the military sphere.

A civilian adaptation would be quite attractive for short- and medium-haul traffic. Ernst Simon, an official of the German airlines Lufthansa, believes there could be a big market in the late 1970's for a VTOL that could carry at least 70 passengers at more than 400 miles an hour.

The principle of the VTOL is quite simple. The jet thrust is directed downward for take-off; once the plane is airborne, the thrust is swiveled to the rear and the plane flies like an ordinary jet. The engineering problems are anything but simple, of course, and the take-off requires a great deal of fuel.

It was the military potential that drew the development money, and the withdrawal of the funds has all but torpedoed the whole project. The interest of the defense planners cooled for several reasons. The time has come for basic decisions on the fighter planes of the mid-1970's and beyond. The VTOL looked risky, and the planners have opted instead for a multi-role short-take-off plane (STOL).

The STOL is a different kind of animal. The vertical take-off plane hurls itself straight into the air by brute force and prodigal amounts of fuel, without taking advantage of the lift that ordinary planes get from the airfoil-shaped wing. Most STOL planes, on the other hand, milk every advantage they can from their wings by adding huge flaps and leading-edge slots to increase the lift.

The saving is tremendous. Britain's Harrier, for example, which can operate in either the VTOL or STOL mode, saves a gallon of fuel for every foot of runway it uses.

Germany is also in the forefront of STOL development: The first regularly scheduled commercial STOL service in the U.S. (SN: 10/7, p. 229) uses the German-built Dornier Skyservant.

Three VTOL planes had reached the prototype stage by the time the decision to cut-off support was made. They are:

- The VJ 101 fighter of Entwicklungsring Süd, a partnership of Bölkow and Messerschmitt. It was both the first VTOL and the first supersonic plane to be developed and built in Germany. It has six turbine engines, four of which have afterburners, providing 16,500 pounds of thrust.
- The VAK 191 fighter of Vereinigte Flugtechnische Werk (Heinkel, Krupp and Focke Wulf), with high subsonic cruising speed. It was planned for close air support missions.
- The DO 31 medium cargo plane, built by Dornier. It is very large by present-generation VTOL standards, with a gross weight of 60,500 pounds.

In addition there had been development work on the VC 400 turboprop transport, also by VFW. This was the plane that might have been adapted for the civilian market, but it hasn't reached the prototype stage by the time funds dried up.

Government officials deny that the research cost of the vertical-take-off plane has been lost. It will be valuable, they say, for the development of future civil and military aircraft.

But industry spokesmen complain that the value will be for other countries, not for Germany. The U.S., for example, also has a number of VTOL models at the prototype stage.

The aircraft representatives haven't give up hope for a Government assist in producing a civilian VTOL. But the money would have to come from somewhere other than the Defense Ministry.