

In any event, obviously, as airplanes got faster and the pressure or stress on the hull of the airplane, including the windshield became greater, the tendency, of course, was to make the windshield smaller and stronger. If you have a large expanse of glass, this means that the glass has to be much stronger to withstand the pressure over a larger area.

So there apparently has been some tendency to reduce visibility. I might stress again that our recommendation here is not directed particularly at airline aircraft. It is airline aircraft, yes, but also we would like to see better visibility out of some of our general aviation aircraft.

Mr. DEVINE. Are we getting to the point of no return on speed, perhaps?

Mr. KAYNE. I would not try to minimize the difficulties, Mr. Devine, of the manufacturers or designers in producing high speed aircraft with better visibility from them. The military at one time or another have approached this by placing the pilots in, you might say, a bubble configuration, so that he was elevated above the fuselage a little bit and could see out better. There have been a number of schemes on this. This is one that we would like to see greater concentration on, on the part of not only the manufacturers and researchers, but we think possibly NASA should be able to contribute some very good research work in this field.

Mr. DEVINE. To get to another area, would it be your opinion, Mr. Kayne, that proximity warning indicators in general aviation aircraft, which would be perhaps within the financial means of some of the private pilots, and collision avoidance systems on the commercial aircraft, the two devices, although having the same purpose but being different in operation, do you think they would help solve some of these midair problems?

Mr. KAYNE. I think they would help greatly, sir. I know there has been some discussion informally between pilots. In fact, we have talked this over with some of the airline pilot group. There was some talk of that at their last safety forum here in Washington. The thinking is that the airlines, and this is my personal opinion, too, must have a collision avoidance system in their aircraft, for one.

Two, we have conceived this proximity warning indicator, which I will refer to as PWI, as a simple device, possibly on a noncooperative basis, so that this gives you warning of someone else in your vicinity. We hope that could be a building block to go into the collision avoidance system. If it would not be, then you could carry the two systems, say, in an airline airplane. We could carry one but they could carry both the sophisticated and the simple system and then they would have protection against themselves and protection against any intruder of any kind that did not have a system or if the collision avoidance system was not operating.

Mr. FRIEDEL. I know back in 1957-58, an invention was placed on the dashboard of an aircraft and there would be an indication that if a plane was coming from the right, the light would light, on the right side, or from the left on the left side, and at mileages that were indicated. The only thing you could not do with that was to tell at what altitude the plane was. I believe this is a simple device and not very expensive, so far as I know. That would be a tremendous help to the general aircraft, the small planes. Why that was not pursued, as