

'Navigation in High Speed Flight'

IN the report of the discussion on Wing Commander Anderson's paper on Navigation in High Speed Flight (Vol. 3, No. 1, pp. 72-3) Mr. E. W. Pike was wrongly reported in certain places. His comments should have read as follows:

Mr. E. W. PIKE (B.O.A.C.): In his final remarks Wing Commander Anderson to some extent answered one question I was going to ask when he stated that all he said about high speed navigation applies also to our present-day navigation. Unlike the speaker, I have spent most of my flying life in civil aviation and I can assure him that his remarks do apply to that. We are just as much concerned with fuel now as I imagine we shall be when we operate jet aircraft. On many B.O.A.C. routes we already plan our loads to the nearest pound of fuel; this involves testing the gravity of the fuel and a great deal of care on the part of special ground personnel in preparing a pre-flight plan. At present, we do not use graphs, but tabulations which are checked in the air, and although I do not wish to imply that our flight engineers are only concerned with fuel problems, they do occupy a great deal of their time during flight. As a matter of fact, on our North Atlantic operations we carry at present two flight engineers to one navigator in the crew.

The flight plan shown seemed to visualize level flight at cruising altitude. It seems, however, that the optimum flight path will involve a continuous climb until the final descent from maximum altitude.

With regard to fuel, and I apologize for stressing this aspect, I very much doubt whether with the advent of jet aircraft the situation will really become as critical as is envisaged. It is difficult to justify operation of an aircraft if that aircraft, by virtue of its characteristics, can only carry sufficient fuel for an immediate landing on arrival at destination. I very much doubt whether that will be the case. In fact, it seems to me that the problem of controlling jet aircraft is just the same as the problem of effectively controlling all aircraft. I do not think that we can say now that it will be impossible for jet aircraft to hold and that an immediate landing is essential, although from an airline's point of view it is desirable.

The importance of accurate outside air temperature measurement will be emphasized when we operate jet aircraft, since engine performance is critically affected by temperature.

There is one more important function we shall have to perform, that is to measure wind components on our flights, both to inform the meteorologist to assist his predictions, and to build up records for our own purposes. This envisages, among many other instrumental requirements, an air mileage unit of considerable accuracy.

As regards radio, I agree very much with Wing Commander Anderson. The importance of sure-fire aids is evident but I am a little worried by the implication that the pilot does not need to know where he is. I have stressed two main requirements, to know where he is and to know what to do. The reasons for these can be argued at length: If a jet aircraft has to divert for any reason, because of its high fuel consumption it is desirable that it should do so immediately; therefore it will have to have accurate knowledge of position. There is the further requirement that for reasons of air traffic control the position of an aircraft is

important. I believe that two very important factors for the successful operation of jet aircraft will be an efficient system of operational control by the airline, which means that the air/ground link must provide knowledge of where the aircraft is, and first class point-to-point communications at ground level. Whatever radio aid is adopted, besides being sure-fire, should be simple and must be directly interpreted by the pilot.

As regards landing technique and Wing Commander Anderson's statement that one does not need to know the position of the aircraft, it is in fact a fundamental requirement of the I.L.S. system that the marker beacons or compass locators should give position checks at the vital points on approach.