Air Traffic Control Project
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SUBJECT: BI-WEEKLY REPORT, FEBRUARY 17, 1950

1.0 GENERAL

(W. G. Welchman)

E-2009, entitled Approach from High Altitudes, contains the results of two weeks' thinking on the following lines:-

The idea of a helical descent pattern was introduced just in time for the third Summary Report. On reviewing our progress since then it seemed to me desirable to try another line of study. We cannot expect high speed computers to be in general use for many years and in the meantime the proportion of jet aircraft will be increasing; we should therefore consider what type of system would be suitable for jet aircraft that must have uninterrupted descents.

It may be some months before the work of Wieser, Linvill and Orden will lead to an estimate of the highest accuracy with which an aircraft can be expected to follow schedule instructions; in the meantime we could be looking at the effect of increasing the minimum interval between landings, say from thirty seconds to one minute. In the helical descent system the correction of errors takes a long time and the stringency of the requirements for accurate flying is not reduced fast enough with distance from the airport; we want to avoid these defects. The slow response of an aircraft to speed control means that in a system based on giving an aircraft speed control instructions it will not be possible to correct errors in schedule quickly; it is worth looking into the possibility of making the slowness of speed variation a positive advantage by using measured speed to predict path length and by choosing suitable paths. With descent at 500 ft. per minute and landing intervals of 30 seconds it would not be possible to achieve safe separation by altitude control alone; higher rates of descent and longer intervals between landings might make altitude control sufficient by itself.

(C. R. Wieser)

The last two weeks have been spent in the preparation of the fourth Summary Report.

1.0 GENERAL (continued)

(W. K. Linvill)

I am writing a report summarizing the flight characteristics of typical airplanes. It incorporates the standard notation used by the N.A.C.A. In addition to summarizing the control equations stated in an earlier bi-weekly report it gives the limit of linear range of the various attitude variables. A second part of the report relates the attitude variables to path variables. This report will appear as an appendix in the fourth Summary Report.

(A. Orden)

The reference paths used for study of stabilization of angular progress have thus far been circles with center at the origin. During the past two weeks the geometrical considerations involved in use of other curves were examined. θ vs. t schedules were set up for constant speed flight on off-center circles and on several types of spiral. The angular rate for these curves is not constant, since, as pointed out by Welchman in M-2033, the only constant speed paths which also have constant angular rate are circles centered in the origin and circles which pass through the origin. Spiral paths under angular control might serve as entry to a circular "concourse." Schedule stabilization on the spiral section would permit merging of paths on the "concourse."

(D. R. Israel)

An Inter-Office Memo describing my visit to the CAA and the impressions of this trip was prepared and distributed.

An E Note, E-2008, has also been prepared and circulated. This note briefly describes the present CAA system and methods of control. The application of a digital computer to particular parts of this system is also discussed.

Work is now underway on the preparation of an M Note describing the work which was done last month on the system of approach to the helix.

1.0 GENERAL

(D. R. Israel) - continued

A card index of all material dealing with phases of Air Traffic Control has been prepared. This will ultimately include a listing on cards of all pertinent articles, regardless of whether they are available in the Barta Library. The classification is now by subject matter only, however it is hoped that it will soon be cross-indexed and filed by authors also. The index is kept in Room 202 and is available to all. Suggestions regarding this index and all contributions (references, bibliographies, etc.) will be appreciated.