Air Traffic Control Project
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SUBJECT: BI-WEEKLY REPORT, AUGUST 19, 1949

1.0 GENERAL

(W. G. Welchman)

I personally have spent almost all my time on the preparation of Summary Report 2, which is to cover our activities during the period April 25, 1949 to July 25, 1949. The greater part of the report is now in draft form but some work remains to be done on the presentation of two illustrative codes. During June and July, Bob Wieser and I paid a number of visits and read a good deal of literature. The Summary Report will contain a general analysis of the impressions that we obtained during that period.

(C. R. Wieser)

Some time has been spent examining the dynamics of an aircraft with an instrument which measures the difference between desired and actual position along the direction of the flight path. Such an instrument would supply data to the pilot or autopilot to adjust the throttle to maintain the proper position. The system was analyzed in a much simplified form which assumed linearity and neglected lags in the pilot's response. Even in this simplified form, the system equations indicate that some form of rate information, such as air-speed, will be necessary for stabilization.

A more realistic analysis will require representative data on the dynamics of the pilot, engine, and airframe.

The Sperry air traffic control system was studied. It is an (r,θ) system using one ground station. All information is transmitted on a 5000 mc continuous wave carrier. Distance and azimuth are measured by phase comparison.

The General Electric Tricon system of triple-coincidence navigation was studied. This is a hyperbolic system which uses three synchronized ground stations. By varying the delay between transmissions of the slave stations it is possible to produce a

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(C. R. Wieser) - continued

pulse pattern which will cause all three pulses to coincide at a particular point in space. These points are interrogated in steps along the flight lanes.

Both of the above mentioned systems interrogate a volume of space rather than a particular aircraft. While this system does away with the difficult problem of true provate line communication and identification, it greatly lengthens the time required to scan a given area.

(A. Orden)

The formulation of a simplified model of an airport approach traffic control plan using a digital calculator has been completed, and a Whirlwind I code based on the plan is nearly done. The plan and the code are sufficiently detailed that it should make available fairly useful preliminary estimates of the operating characteristics required in applying digital calculators to airport approach control.

(A. J. Perlis)

A detailed code for the programming of the positioning and tracking of non-cooperating aircraft in a simplified equilateral triangle net is near completion. The case where planes both enter and leave the system is being added to the program as well as a means of detecting spurious radar readings. A concise report on this code is being prepared for the next Air Traffic Summary Report.

(D. R. Israel)

A description of the ta and ao orders was written for use in Summary Report 2. A code for the private line was also prepared for use in that report.

An "Introduction to Coding" based on lectures given by W. G. Welchman during the spring of 1949 at MIT has been prepared in preliminary draft.

At the present time I am engaged in writing up a code for the Ship Lane Control Problem. This code was prepared some months ago, when the problem was discussed by the Application Studies Group, but has not yet been published.