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REEL - C

1472

A.T.I.

34405

A STUDY OF ANTI-AIRCRAFT TRACKING
Final Report under Contract OMA sr 168

Iowa State College

Ames, Iowa

SUPPLEMENTARY REPORT II

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SUPPLEMENTARY REPORT ON TRACKING II

This report completes the study of tracking with the "job miniature" described in detail in previous reports. In it will be found the results of experiments conducted (a) to determine the effect of periods of inactivity on tracking ability and (b) to resolve any differences in tracking for monocular vs. binocular vision.

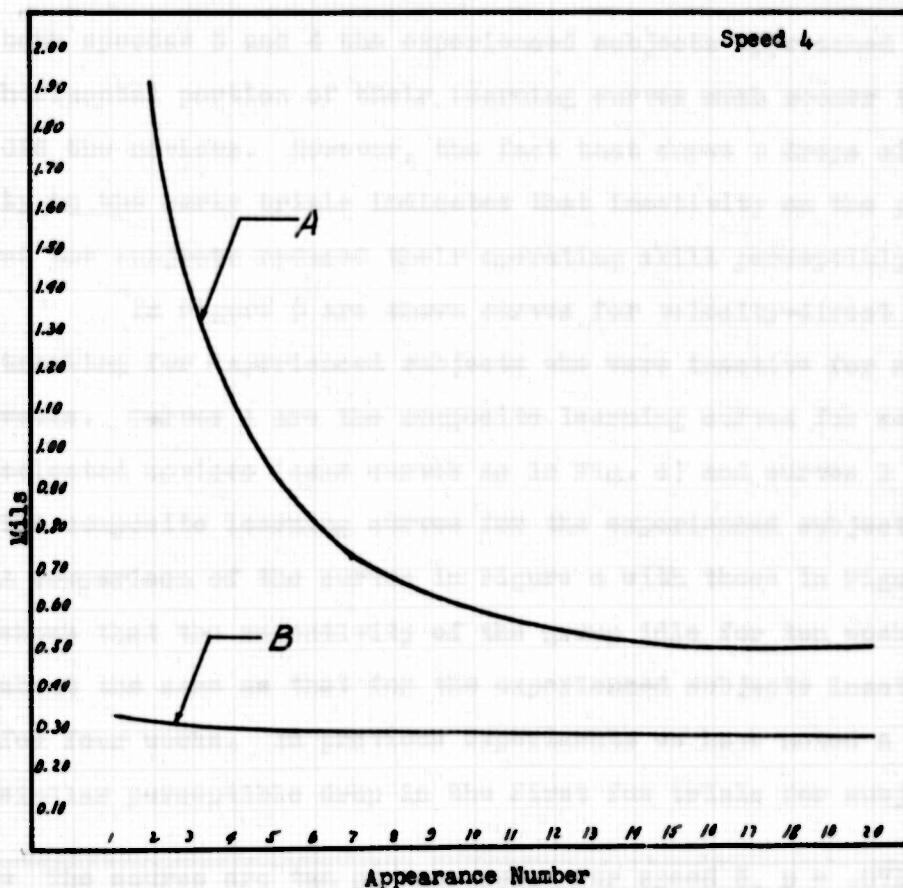
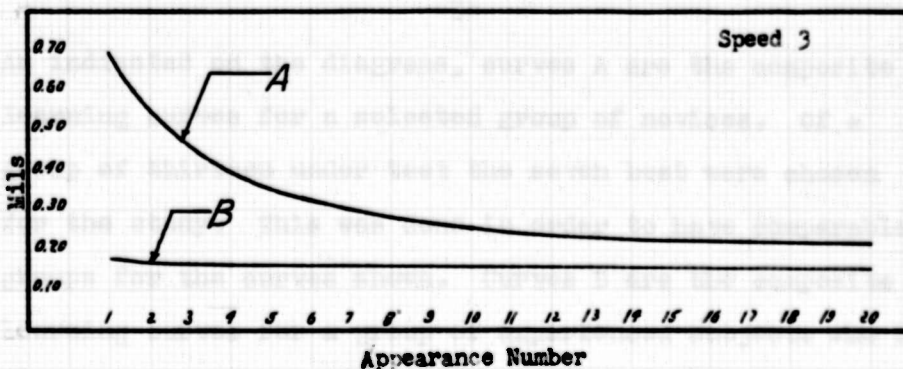
In part (a) tests were made with subjects who were experienced in tracking last summer and who returned to school this fall after a month's vacation. Tests using velocity-direct and acceleration-velocity-direct settings were used so that any differences in the two could be detected. In order to have true learning curves with which to compare the data for the experienced people, groups of inexperienced subjects were tested for one week with corresponding apparatus settings.

The tests were conducted as described in previous reports. Each subject was asked to take twenty tests in a given week and the tests were spaced at least an hour apart. The subjects were paid for each set of twenty tests completed.

Results

The results of the experiments with aided-laying (or velocity-direct tracking, $d/v = .17$ sec.) are shown in Fig. a.

LEARNING CURVE COMPARISON, TEST 27



- A CURVE FOR SELECTED NOVICES
- B CURVE FOR EXPERIENCED SUBJECTS AFTER 4 WEEKS' INACTIVITY.

FIGURE α

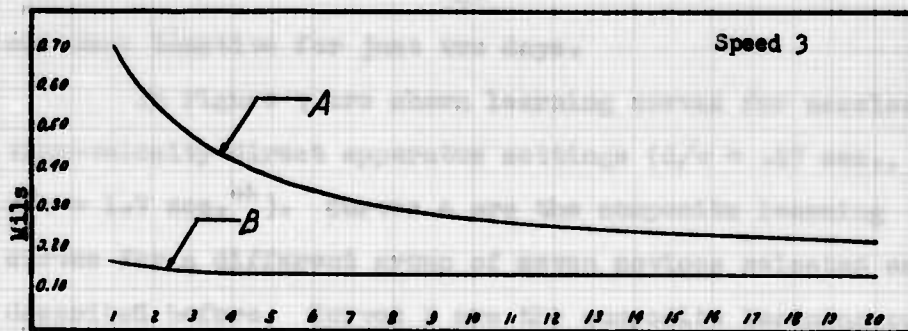
As indicated on the diagrams, curves A are the composite learning curves for a selected group of novices. Of a group of thirteen under test the seven best were chosen for the study. This was done in order to have comparable groups for the curves shown. Curves B are the composite learning curves for a group of experienced subjects who had not taken tests for four weeks. It will be noted that for both speeds* 3 and 4 the experienced subjects approached the horizontal portion of their learning curves much sooner than did the novices. However, the fact that curve B drops slightly in the early trials indicates that inactivity on the part of the subjects reduced their operating skill perceptibly.

In Figure β are shown curves for velocity-direct tracking for experienced subjects who were inactive for nine weeks. Curves A are the composite learning curves for seven selected novices (same curves as in Fig. α) and curves B are the composite learning curves for the experienced subjects. A comparison of the curves in Figure α with those in Figure β shows that the retentivity of the group idle for ten weeks is about the same as that for the experienced subjects inactive for four weeks. In previous experiments we have noted a similar perceptible drop in the first few trials for subjects

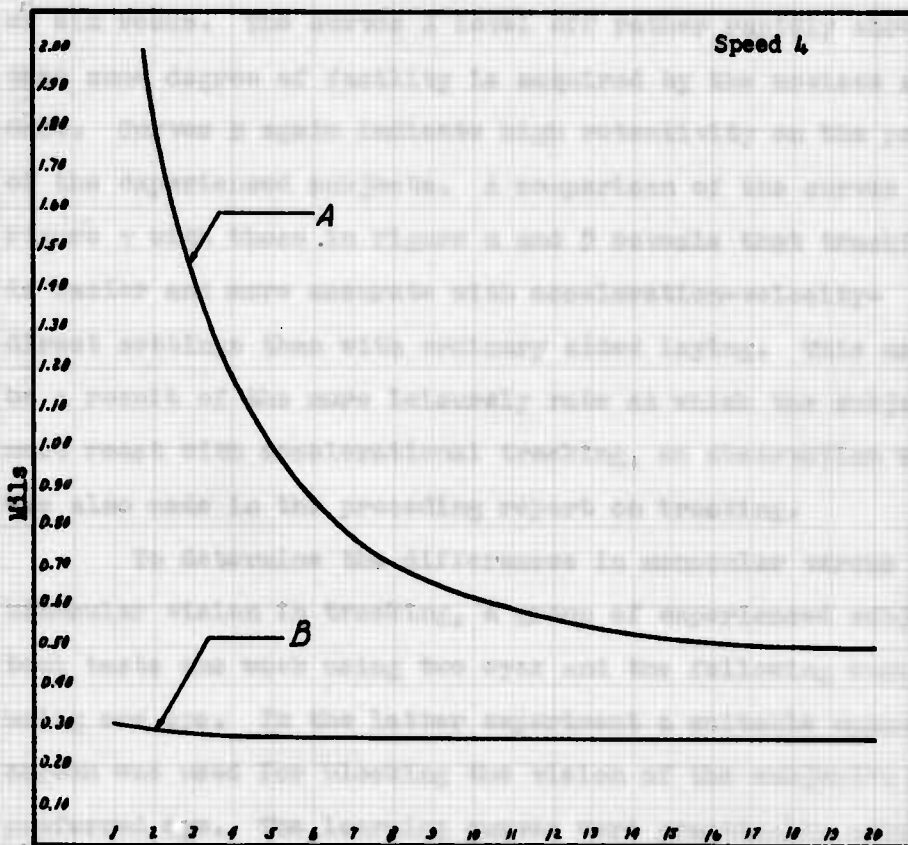
* The course arc tan pt was used. For speed 3, $p = .071 \text{ sec.}^{-1}$ and for speed 4, $p = .125 \text{ sec.}^{-1}$. For details see previous reports.

Form E-4

LEARNING CURVE COMPARISON, TEST 2⁷



Appearance Number



Appearance Number

A CURVE FOR SELECTED NOVICES.

B CURVE FOR EXPERIENCED SUBJECTS AFTER 2 WEEKS' INACTIVITY.

FIGURE *B*

who were inactive for just two days.

In Figure γ are shown learning curves for acceleration-velocity-direct apparatus settings ($d/v = .17$ sec., $a/v = 1.7$ sec.⁻¹). Curves A are the composite learning curves for a different group of seven novices selected as described before. Curves B are the composite learning curves for experienced subjects who had been inactive for a period of six weeks. The curves A level off rather rapidly showing that some degree of facility is acquired by the novices at once. Curves B again indicate high retentivity on the part of the experienced subjects. A comparison of the curves in Figure γ with those in Figure α and β reveals that tracking is easier and more accurate with acceleration-velocity-direct settings than with ordinary aided laying. This may be a result of the more leisurely rate at which the subject must react with accelerational tracking, an observation which was also made in the preceding report on tracking.

To determine the differences in monocular versus binocular vision in tracking, a group of experienced subjects took tests one week using two eyes and the following week using one eye. In the latter experiment a suitable opaque screen was used for blocking the vision of the subject's non-preferred eye. The learning curves were practically coincident and are identical with curves B, Fig. α . The averages of the last ten runs in each case were calculated and are

LEARNING CURVE COMPARISON, TEST 40⁹

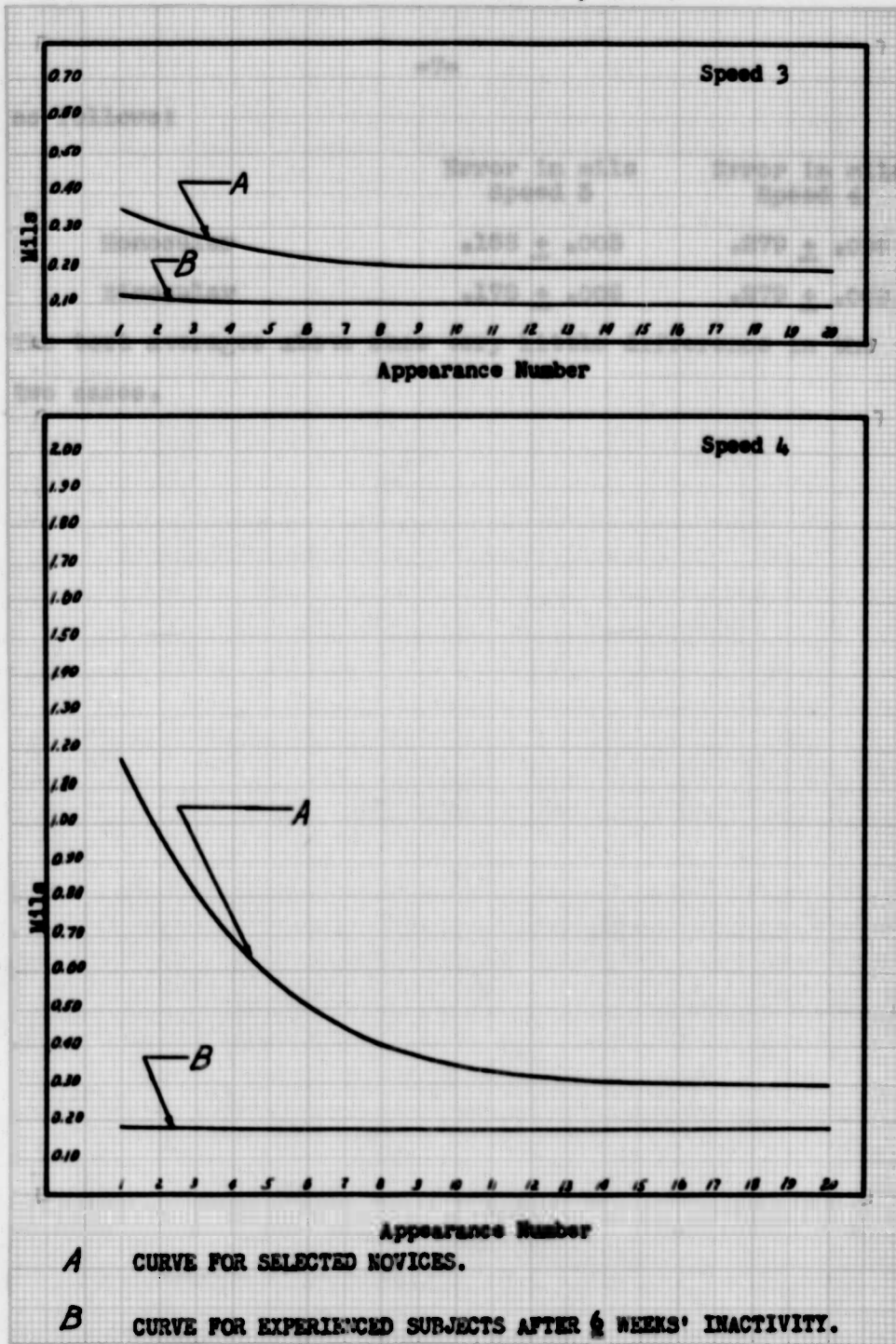


FIGURE 7

as follows:

	Error in mile Speed 3	Error in mile Speed 4
Monocular	.168 ± .003	.279 ± .006
Binocular	.173 ± .006	.279 ± .008

The test averages above show very little difference in the two cases.

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ABSTRACT:

A final report is given on a study of antiaircraft tracking with the "job miniature," described in a previous report. Experiments were conducted to determine the effect of periods of inactivity on tracking ability, and to resolve any differences in tracking for monocular vs. binocular vision. Tests using velocity-direct and acceleration-velocity-direct settings were used so that any differences in the two could be detected. It was noticed that for different speeds the experienced subjects tested approached the horizontal portion of their learning curves much sooner than did the novices, which indicated that inactivity reduced their operating skill perceptibility.

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