In figure — may be seen the photograph of the A-scope presentation combined photographically on the same frame with the image of the target and rocket salvo.

As previously stated the problem is to determine by means of the A-scope presentation when the rockets are in the same plane with respect to ~~the~~ the firing aircraft as the target. ~~It will be noted that the pulse corresponding to the~~

On the right side of the A-scope presentation is seen the radar transmitter pulse (main bang). ~~Just to the l~~ In the first frame is the pulse-echo from the target may be seen. In frames two through five the pulse return from the rocket salvo may be seen approaching the target pulse. In frames 6-7 & 8 the pulses are seen to be merging. In frames 9 or 10 the two pulses have merged indicating that rockets and target have the same range at some time within the time interval during which these pictures were taken. In frames 11 through 17 the pulse from the rockets is seen beyond the target pulse indicating the rockets have passed the target. By quick inspection of the A-scope presentation one may pick frame ten for assessment since the pulses from the target and the rockets show greatest coincidence in this frame. (Measuring the photograph showing the rocket trails and the target (using the twenty foot wing span of target as a scale) indicates the center of the rocket salvo was about twenty five feet high and five feet to the left.

Greater accuracy in determining the rocket crossover time may be achieved by graphical interpolation. Figure — shows a plot of the positions of the leading edges of the target (in circles) and rocket (crosses) pulses against time. An average curve may be drawn thru each set of points by means of a French curve. The intersection of the two curves gives the time of range coincidence of the target and the last rockets fired. (From figure — this time occurs eight-tenths of the way from from frame 10 to frame 11). A similar plot (in figure —) of the trailing edges of the target (squares) and rocket (triangles) pulses gives the time at which the first-fired rockets and the target had the same range. (from figure — this time occurs half way between frame 9 and 10.)

Determination of the average deviation of the points from the faired curve was one-half frame for the target and one-fifth frame for the rockets.

$\frac{1}{80} \times 500 = 6'$

This indicates that the more rapidly the pulse (i.e the rockets) is moving the more accurately the curve may be drawn. (This would also logically follow from the fact that at higher relative velocities, more pulse displacement occurs from one frame to the next decreasing the percentage error ~~of~~ of this displacement in proportion).

Conclusions that may be drawn are:

1. For rapid assessment of rocket miss distance the coincidence of ~~the~~ target and rocket pulse on the A-scope presentation may be determined visually (to within one frame). The miss distance of the rocket salvo centroid may ~~then~~ be determined by stadiometrically measuring the distance from the target to the center of a circle enclosing the rocket salvo.

2. A more accurate estimate of crossover time in terms of photographic frames may be had by plotting the position of the leading and trailing edges of both the pulse return from the target and the rockets against time. The intersection of the leading-edge curves gives the crossover time of the last fired rockets, whereas the intersection of the trailing-edge

curves gives the crossover time of the first-fired rockets.

3. A preliminary estimate of accuracy in determining the crossover time from the scatter of the plotted points indicates a probable accuracy of ½ frame or 1/40 second for tail on approach to target. ~~[illegible]~~ Faster closing rates should increase the accuracy by a factor of two.