and normal to longitudinal axis of the camera's field of view. With present day radar systems the pulse length ~~is quite long occupys a~~ occupies an appreciable portion of the space between rocket and targets and makes direct assessment of the film difficult. The ideal soluation would be a set with almost infinitesimal ~~we~~ pulse width so that position of small objects could be determined to any desired degree of accuracy. Practical limitation of course prevent this so a compromise must be made. Theoretically the shortest pulse ~~necces~~ width will be that needed to resolve ~~to~~ the distance between the ~~shortest~~ closest spacing of of the rockets. In this case this minimum ~~distance~~ was set as the distance between ~~a salvo salvoes~~ every other rocket fired from an 86-D - Time wise this is 16×10^{-3} sec. and with an assumed velocity of 2.5×10^{3} ft. sec. this distance becomes 40'. Theoretical pulse width of a set capable of resolving this distance (assuming bandwidths are commensurate) is approx $\frac{40'}{490'/\mu sec} \cong .0815\ \mu sec.$

It was first decided to ~~to~~ build a system with .05 μ sec. to further improve this resolution. Preliminary design was completed for the magnetron pulser and design and construction of the remainder of the system was completed and tested. This equipment consists ~~of chain~~ of a modified APS-23 mixer, ~~a~~ chain amplifiers ~~of~~ capable of 130 mc. bandwidth and chain video amplifiers of 140 mc. bandwidth.

Section from synchronized films of M-PA R.O.-FE1.

~~These~~ Time is from top to bottom

In ~~th~~ exp. #1 of A scope film rockets are on extreme left with target appearing ~~about~~ approximately an inch right of them. Rockets ~~a~~ move rapidly outward while the target moves in relatively slowly until ~~they merge~~ the centroid crosses target plane in frame 8. Early rockets crossed earlier than this while late rockets have just cleared the target in frame 9. The radar pulses are inverted in in this sequence.

Typical A scope presentation of ~~the~~ rockets approaching a target. Time is upward ~~while~~ and increasing range from left to right. In the first ~~photo~~ exposure the target is a well defined pulse midway along the trace while rockets appear at extreme left. Actual target position is at the ~~leading ed~~ pulse leading i.e. left edge. Target pulse moves relatively slowly toward the left while rockets move right. Note increasing pulse width as rockets velocity and spacing increase. In frame 6 they occupy approximately the left half of the pulse. In frame 7 leading rockets ~~are w~~ are within 100' of target plane.

Frames taken from A scope film
on Model 2A Radar Optic F.E.1.
35 mm ~~Cl.K~~ film, 20 ~~0~~ frames
per second, F-2, 2 inch lens
5CP11A C.R. tube with 6 KV
total acceleration - unmodified
G-30 radar

~~View of~~ Lens and mirror assembly used to combine a scope image with strike image–

Shown is all the gear necessary to ~~to~~ add to any airborne radar set ~~on fighters~~ to ~~so~~ ~~enable~~ score rocket miss distance. Unit with 5 tubes on ~~left~~ Right is sweeps and video chassis. MIV-C Camera is on left fitted with lens adapter for combining A scope image on face of 3JP11 tube with strike information. In center is H.V. supply.

Model 2B Radar Optic F.E.I.
with access panels removed.

~~These frames from strike films illustrate typical~~

These are frames from typical ~~st~~ strike films. ~~In one a~~ ~~One~~ one pass is a clean miss ~~although the last frame has appears to be a could be~~ while in pass two hits are scored by ~~two~~ rockets high in the pattern. The centroid is low however. It is obvious that without a hit or some method of determining time of crossover it is impossible to determine magnitude or direction of miss

Pictures are 35 mm, 20 frames per second with a 4 inch lens. 9' X 45' marquisette banner

Photographic Resolution test of small high speed tow
target. Target is same distance as crossover
of rockets commonly occur. 35 m m Film –
24 frames per second – 4" lens – Light Red filter