

2.7.11. Missile Simulator 171

Problem: To make a graphical record of the results of firing a missile at a target without firing this missile

Method: Photograph the strike area with a motion picture camera to provide a record of the flight path of the target.

Generate an electrical analog of the missile flight path suitably modified by launch conditions and referenced to a coordinate system. Combine with the strike image an image of missile analog quantities of its path as viewed from the aircraft. Provide an indication of time of slant range coincidence of target and missile. Measure deviations of the a/c from the missile zero reference system and by computation derive corrections to the missile image -

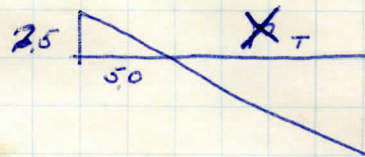
27-11

Missile Simulator
— Test vehicle —

P-II

1. Strike recorder and analog image mechanism —

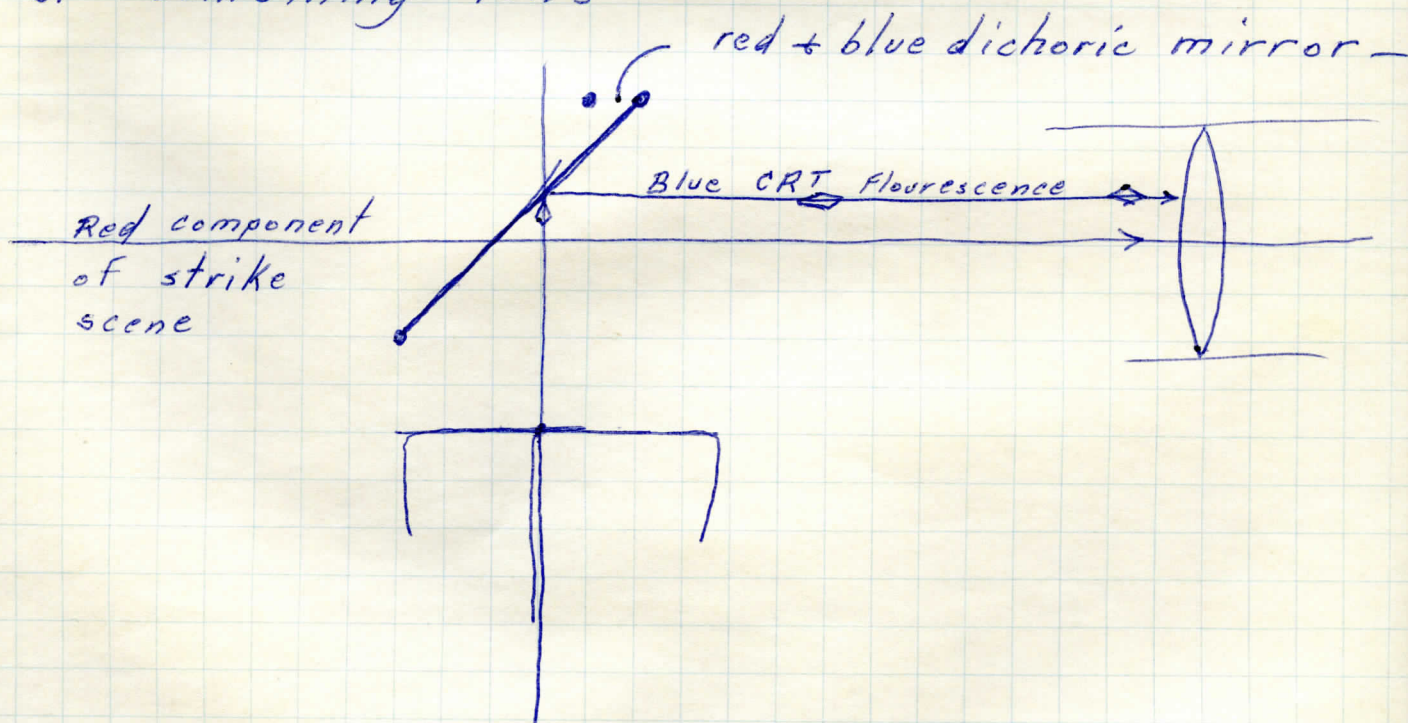
a. 35 mm 32 F.P.S.



50 mm lens will provide a coverage
of $.5 \times X_T$ or at $2 \times 10^3' : 10^3'$

This lens will provide an image size
of $\frac{50 \times 40'}{2 \times 10^3}$ mm. = $10^2 \times 10^{-3} = 10^{-1}$ for a 40' A/c Tgt.
at $2 \times 10^3'$

b. combining lens



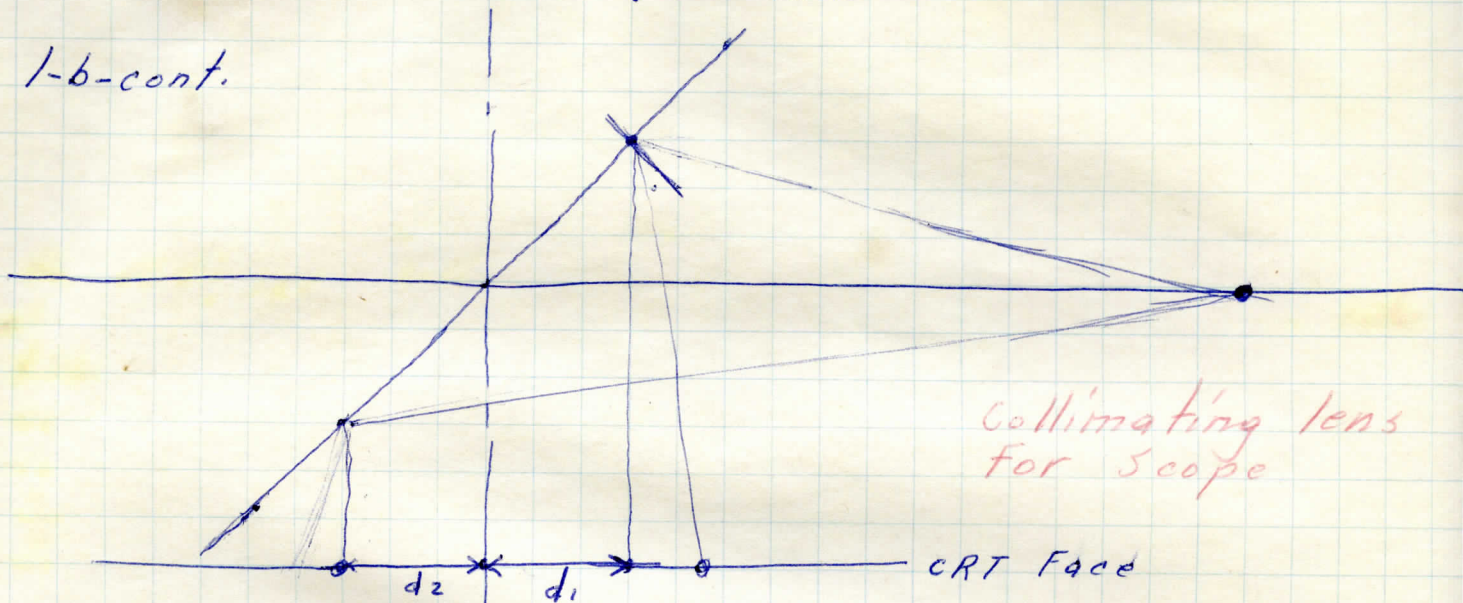
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Missile Simulator

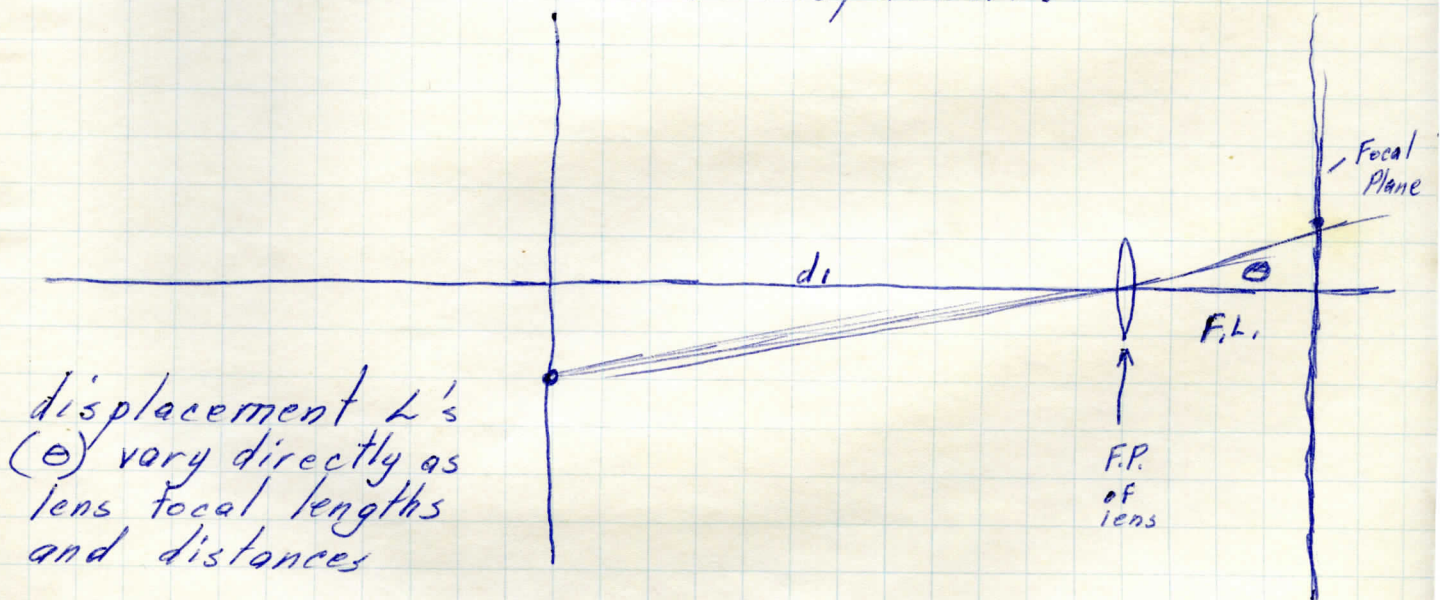
P II

Test Vehicle

1-b-cont.



CRT Face is imaged as if it were in front of lens and transparent.



displacement L's
(e) vary directly as
lens focal lengths
and distances

Assuming that a 1:1 ratio exists on
equivalent CRT Face distance & F.L. ?

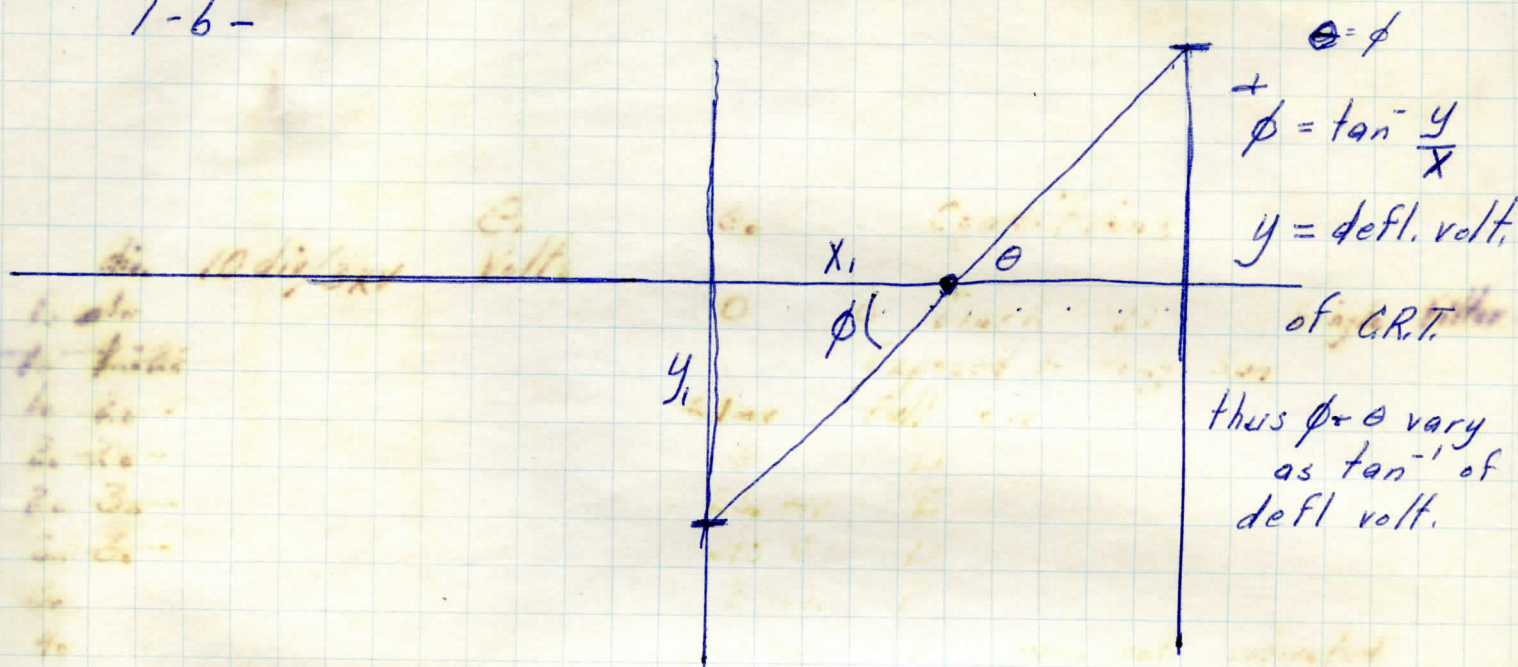
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Missile Simulator

P II

- Test Vehicle -

1-6-



2 - Missile Analog Generator

Missile chosen must be simulated

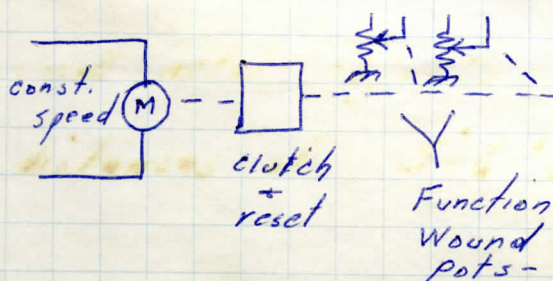
in X, Y & Z - X = distance along launch line
 Y = Vert. displ. from " "
 Z = Horiz. " " " "

Launch assumed to be along path from plane in normal attitude

For unguided missile during flight $Z = 0$

" " " " " " $Y = \frac{1}{2} g t^2$
 X is function of missile chosen-ballistics tables
 For this missile assume $X = F(T)$

Electro Mechanical



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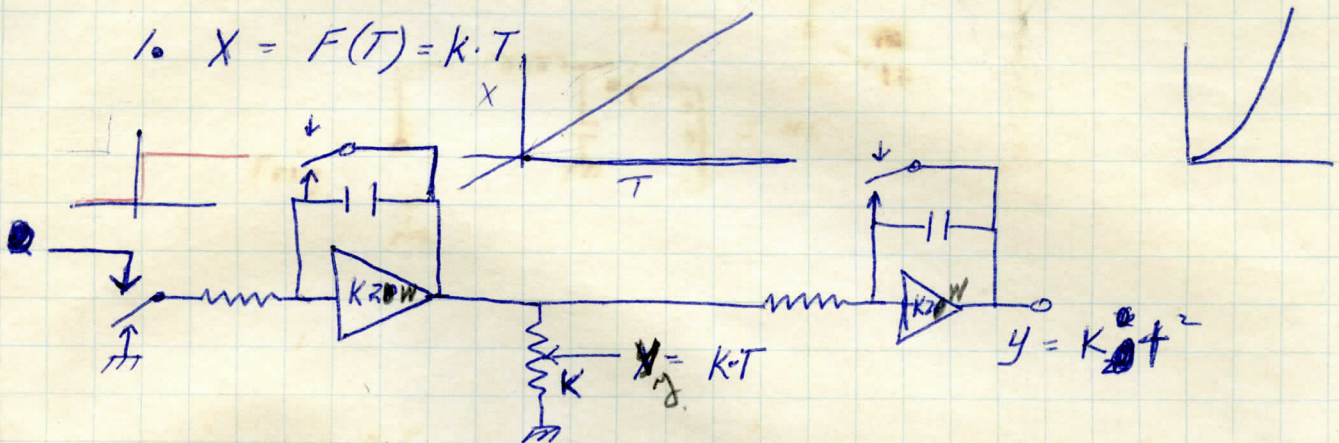
Missile Simulator
Test Vehicle

P-III

2-b

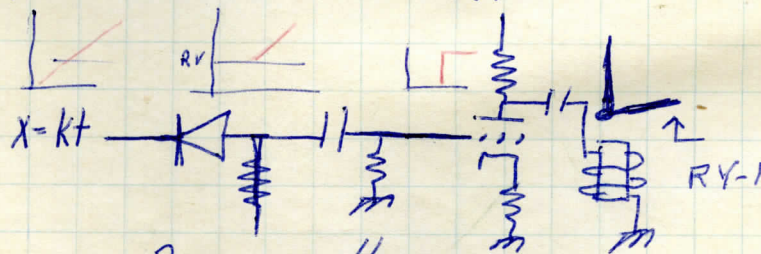
Electronic Analog.

1. $X = F(T) = k \cdot T$



There are many other initial conditions to be accounted for such as temp., altitude, attitude, etc.

3. Q. Coincidence CK to



Range voltage -

on this test range voltage will be set in manually -

b- At coincidence a sine wave can be used to create a 'lethal circle' corresponding to a rocket ^{solo} pattern or burst pattern of a proximity missile.