

## ROCKET-TARGET COINCIDENCE CIRCUIT

### THEORY OF OPERATION:

The multivibrator circuit comprised of tubes  $V_1$  and  $V_2$  is used to generate a blanking pulse which is utilized in blanking out the radar "Main -bang" which normally appears in the video arriving at the grid of tube  $V_3$ . It has been found that it is necessary to blank the main-bang as it is normally of greater amplitude than the coincidence circuit rendering the circuit useless. The 2 megohm variable resistor which is connected to the grid of  $V_2$  was made variable to adjust the generated blanking pulse in lengths so it may be adjusted for the difference in main-bang lengths (time wise) encountered in different radar sets. Two crystals are used at the input of the master trigger so that the multivibrator will not be stopped at the end of the pulse. All of the values of components used in the circuit are not necessarily firm as the only model constructed to date was of bread board configuration and may have slight changes in the final configuration.

The coincidence circuit is comprised of tubes  $V_3$  and  $V_4$  and its input circuitry consisting of the 0.137 micro-second delay line, 2 each .01 capacitors, and 2 each, 10K resistors. The 2 meg pot at the grid of  $V_3$  is used to adjust the level of the grid at a point where it cannot be triggered by the amplitude of a normal locked-on target. An attempt to limit all video to the same level is made by the placement of the 2 input crystals which are biased by the voltage divider comprised of 1 meg resistor and a 50K pot. The delay line serves the purpose of shifting

the video in order that the video may be added at the junctions of the 2 10K resistors and give combined video as pictured in the accompanying diagram. When the circuit has been adjusted so that  $V_3$  cannot be triggered with normal video it is ready to operate. Normally  $V_4$  is in conduction holding  $V_3$  cut off by 7.5 cathode resistor. This also means that the millisecond relay  $K_1$  is normally energized. When the video is of the proper spacing (rocket and target video 0.137 micro-seconds apart)  $V_3$  is triggered cutting off  $V_4$  and de-energizing which marks the strike camera film.

Present plans are to use the run over marker in the normal gun camera to mark the film but work along those lines have not been completed. Two sources of 28 Volts will be supplied to the relays. One source is from the trigger of firing voltage circuits which is the normal supply. This was chosen so that the pilot can render the circuit inoperative until the targets range is less than that of the ground line so the circuit will not mark the film on the passing of the target through the ground lines since relay  $K_2$  is operated off self locking it is only necessary for the pilot to release the trigger to stop the camera, This would make the circuit ready for another firing pass. The other source of voltage is to be used for test purpose on the ground while adjusting the circuits. The 28 Voltage lamp is placed in the circuit as an indicator also for adjusting the circuits. The spring loaded switch is used to release relay  $K_2$  by removing the interlock voltage when adjusting the circuit the normal in-flight position for the switch is such that the 28 Volt source is from the trigger and the spring loaded switch is closed.

PROGRESS TO DATE:

The bread-board model has been constructed according to the enclosed schematic and successful operation has been obtained on the mock-up. Construction has started on building this chassis from installation in the aircraft. Some difficulty has been experienced on the bread board model due to stray pick up but this should be overcome by proper shielding in the first proto type model.