

Retype

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 length so it may be adjusted for the difference in main-bang lengths (time wise) encountered in different radar sets. ~~The two~~ ^{Two} crystals ^{are} used at the ~~input~~ ^{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 delayline, 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~~ ^{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~~ ^{accompanying} diagram.

diagram. When the circuit has been adusted so that V_3 cannot be triggered with normal video it is ready to operate. Normally V_4 in conducting holding V_3 cut off by 7.5 cathode ~~resistor~~ ^{resistor}. This also means that the milli-second ~~insecend~~ ^{proper} relay k, 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 ~~deenergizing~~ ^{de-energising} K, which ~~makes~~ ^{marks} the strike camera film.

Present plans are to use the over-run marker in the normal gun camera to mark the film but work along those lines have not been completed. Two sources of 28Volts will be supplied to the relays. One source is from the trigger or 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 ~~Being~~ ^{operated} relay K_2 is ~~wired off~~ ^{relay K_1} self locking it is only necessary for the pilot to release the trigger to stop the camera. ~~making which~~ ^{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 ajusting the circuits. The 28Volts lamps 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~~ ^{circuit}. The normal in-flight position for the switch is such that the 28 Volt source is ~~from~~ ^{from} the trigger and the spring loaded switch in closed.

Progress

~~Progress~~ to date

The Lead-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 in chassis ^{form} for installation in an aircraft. Some difficulty has been experienced on the ~~bread~~^{bread}-board model due to stay ^{pick}~~pile~~ up but this should be overcome by proper shielding in the first ^{proto}~~shot~~ type model.