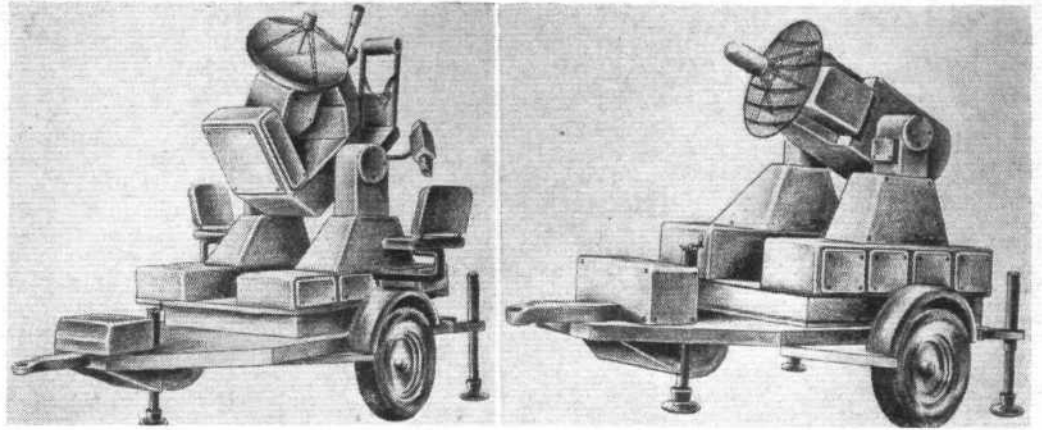


These small sketches show the two main aerial vehicles, the battery radar tracker and (right) the beam transmitter. Both are neat, yet rugged, vehicles, able to go anywhere that wheeled traffic could be assigned.



(e) A switching amplifier for automatically changing over from coarse to fine beam control and also for the transformation of conical into cylindrical co-ordinates and polar into cartesian co-ordinates.

(f) A computing amplifier and gyro assembly for the introduction of the steering coefficients as a function of time, for the transformation of space into missile co-ordinates to compensate for rolling and also for damping missile oscillations about the transverse axes.

(g) An electro-hydraulic servo system for steering the missile by deviating the thrust chamber and propelling nozzle and moving the fins.

(h) A source of auxiliary power consisting of a nitrogen-driven turbine and a synchro-generator.

Naturally enough, a guided missile is an extremely costly weapon and, in peacetime, it must be made recoverable wherever possible. The present Oerlikon Type 54 can, in fact, be recovered after test and troop-training flights, and for this purpose is arranged to break into two portions, each equipped with a parachute. At a pre-determined time after burn-out, the missile is separated into a forward portion, housing the electronic circuits, and a rear section accommodating the rocket motor. Each section is then allowed to fall freely, for a time depending upon the estimated burn-out height, in order to prevent the two sections from drifting over great distances. At a comparatively low altitude, the parachute in each section is streamed automatically.

To guard against loss of control of the missile for any reason whatever, it is possible to cut off the rocket motor by radio and effect emergency separation into the nose and tail portions with immediate deployment of the parachutes.

As might be expected, present missiles are fitted with a telemetering system, which supervises the steering and flight performance during test and training flights.

As already mentioned, the guidance of the powered part of the flight path is effected by deflecting the entire thrust chamber (and with it the propelling gas jet) with assistance from the four tail fins which are deflected simultaneously with the thrust chamber and thus produce the required turning moment about the centre of gravity of the missile. After burn-out, the propelling jet no longer exists, and all guidance has to come from the tail fins. The steering system is therefore so controlled that, at the moment of burn-out, the angular movements of the fins are considerably amplified.

During flight, the delta-shaped wings are displaced longitudinally according to a pre-determined time programme, so permitting the steering ability of the missile to be maintained within the required limits in spite of the rapid changes in weight, lift and c.g. position. Rolling about the longitudinal axis is not prevented aerodynamically but is allowed for by making the characteristics of the steering mechanism such that rolling has no influence on the response of the missile to guidance commands.

It will be noted, of course, that the missile has cruciform wings of equal area (like all British missiles of which photographs have been revealed), and therefore it does not need to bank during turns.

The Oerlikon Type 54 missile, together with its ground equipment and the appropriate training devices, is reported to be in limited production for issue to specially formed anti-aircraft units of the Swiss Army. It is not stated whether the Swiss Government are prepared to export the weapon; if they are, it would seem that this will be the first missile capable of being bought "over the counter."

An outline of the ground organization which would be employed in a defence system equipped with ground/air guided missiles of the Oerlikon type. The central group command post, on the left, would control three firing batteries of the type shown in the main part of the diagram.

