

to the improved results achieved by the fighters after the first week in July. By the 15th July I was using a total of thirteen single-engined and nine twin-engined (Mosquito) squadrons against flying bombs. Six of the Mosquito squadrons alternated between this work and operations over the lodgment area, two of them doing bomber-support work as well. I found that, while some pilots took readily to the work of shooting down flying bombs, the majority preferred shooting down enemy aircraft over France. To instil enthusiasm for the novel and impersonal business of shooting at pilotless missiles, and ensure that pilots were not kept long enough at the task to make them stale, was not the least of my anxieties.

69. In order to get as much speed as possible, I arranged that aircraft which were to be used exclusively against flying bombs should be stripped of their armour and all unnecessary external fittings, and that their paint should be removed and their outer surfaces polished. The engines were modified to use 150-octane fuel and accept a higher boost than usual. In this way we managed to increase the speed of some of the single-engined fighters by as much as 30 m.p.h.

70. Even with these modifications the fighters had only a small margin of speed over the flying bombs. Nevertheless they did have a margin. It was reported that a demonstration by a German pilot with a captured Spitfire had convinced Hitler that our fighters could not catch the flying bomb. This was true of the Spitfire V, and almost true of the Spitfire IX; but it was not true of the Spitfire XIV or the Tempest. Even so, these aircraft had no more than a fractional superiority. Hence the problem was essentially one of time and space. For interception over the sea we used a method of close control from radar stations on the coast, or alternatively a method of running commentary. At best the radar chain could give about six minutes' warning before the flying bombs reached the coast; but in practice the time available to the fighters over the sea was always less than this, not only because of inevitable time-lags but because we dared not risk our modified aircraft on the far side of the Channel, where they might be surprised by German fighters. Later the Royal Navy were to come to our assistance by providing a chain of small craft which operated at three mile intervals seven miles off the French coast, carrying observers who warned our pilots by means of signal rockets and star-shells that flying bombs were on their way. This improvised system was in the final stages of development about the time when the main attack came to a close.

71. Over the land we used the method of running commentary from radar stations and Royal Observer Corps Centres, supplemented by various devices such as signal rockets, shell-bursts, and searchlight beams, for indicating the approach of flying bombs to patrolling pilots. The weakness of this method was that sometimes several pilots would go after the same flying bomb, leaving other bombs to slip through unmolested. However, there was nothing else we could do, for the absence of low-looking radar made close control over the land impracticable.

72. The majority of the flying bombs crossed the coast between Cuckmere Haven and St. Margaret's Bay. The distance thence to the southern edge of the gun belt was in most places about 30 miles. The flying bombs covered this distance in five minutes. Five minutes, then, was the time available to the pilot of an overland fighter to select his target, get within range of it, and shoot it down, unless gunfire had been restricted or he took advantage of the rule which allowed him to enter the belt in pursuit of his quarry. In this case he would have an extra minute or so before he reached the balloon barrage. Thus there was rarely time for a stern chase unless the pursuer started with a substantial advantage in height. On the whole the most effective procedure was to fly on roughly the same course as an approaching bomb, allow it to draw level, and fire deflection shots as it passed, being careful not to fire when it was closer than 200 yards lest it should explode in the air and blow up the attacker.* The hot gases emitted by a bomb immediately in front of the fighter made a steady aim difficult, so that short bursts and frequent aiming corrections were required. Usually several bursts were needed to inflict enough damage to explode the bomb or bring it down. Another method useful on occasions but hardly suitable for general adoption, was to get close beside the target and tip it over by inserting the wing of the fighter underneath that of the bomb and then raising it sharply.

73. Thus, in many respects the fighters had a stiff task. That which faced the guns was, if anything, more awkward still. Theoretically, pilotless aircraft ought to have made ideal targets for anti-aircraft artillery, since they flew on courses which could be accurately predicted from the data on which the technical devices normally employed had been designed to work. For the first time in the war, the gunners were presented with targets that could not dodge. In practice this advantage was outweighed by the speed of the missiles and the critical height at which they flew. They were too high and went too fast to make good targets for light A.A. guns, but were too low and crossed the field of vision of the heavy A.A. gunners too swiftly to give adequate time for the radar and predictors to be used and the guns be laid by hand. These difficulties could be minimised so far as the heavy guns were concerned by replacing the mobile guns used in the original "Diver" deployment by static guns which could be electrically elevated and traversed and were fitted with improved fuse setters and other devices which made them quicker to operate and more accurate. Unfortunately the static guns required concrete emplacements which took some time to instal. A steel mattress, known as the "Pile Mattress," which was devised by the R.E.M.E. detachment at Anti-Aircraft Command provided a way out of the difficulty; and the task of replacing the mobile guns by static guns was started towards the end of June.

* During the first six weeks of the attacks alone, eighteen fighters were substantially damaged and five pilots and one Navigator/Radio Operator killed in this way. Even though the flying bomb could not hit back deliberately, "Diver" patrols were by no means unattended by risk.