Bomber's Radar

General Survey of the Three Primary Systems Used by Bomber Command

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SO much has recently been published about radar since the security restrictions were alleviated that the subject is, on the surface, fast becoming hackneyed. However, up till now, no description has been given of the operational use of the three main systems used by R.A.F. Bomber Command, although the code name titles of the systems, Gee, Oboe and H2S, were recently released.

Readers of *Flight* will by now have gained a fairly good insight into the basic fundamentals of radar from the articles which have already appeared from time to time, and, in view of this, we are here going to deal only with what happens in operation and with the way in which the systems are used.

First, it is worth while going back to the early days of the war in order to gain some appreciation of what bombing conditions were originally like, when the crews were doing their best to cope in spite of having no especial aids. In 1940 there was only one group (equipped with Whitleys) in Bomber Command which was trained for night operations; however, all the remaining groups were fairly quickly trained, and, as time went on, bombing was increased. Nevertheless, it was ascertained that, despite good reports, the average of hits on the targets was little more than 3 per cent of the total dropped.

During the latter part of 1941 efforts were made to plan raids with a degree of accuracy, and, as a help, the Boffins (civilian scientists) were working flat-out to give the bomber crews accurate navigational aids. The first of these was Gee, and its first great success was the famous 1,000-bomber raid on Cologne on May 31st, 1942, when 1,700 tons of bombs were lifted and 30 per cent. were recorded as target strikes: an increase in efficiency which paralleled the size of the raid. In this spectacular and pioneer foray between 300 and 400 aircraft equipped with Gee were included in the main force of 1,000.

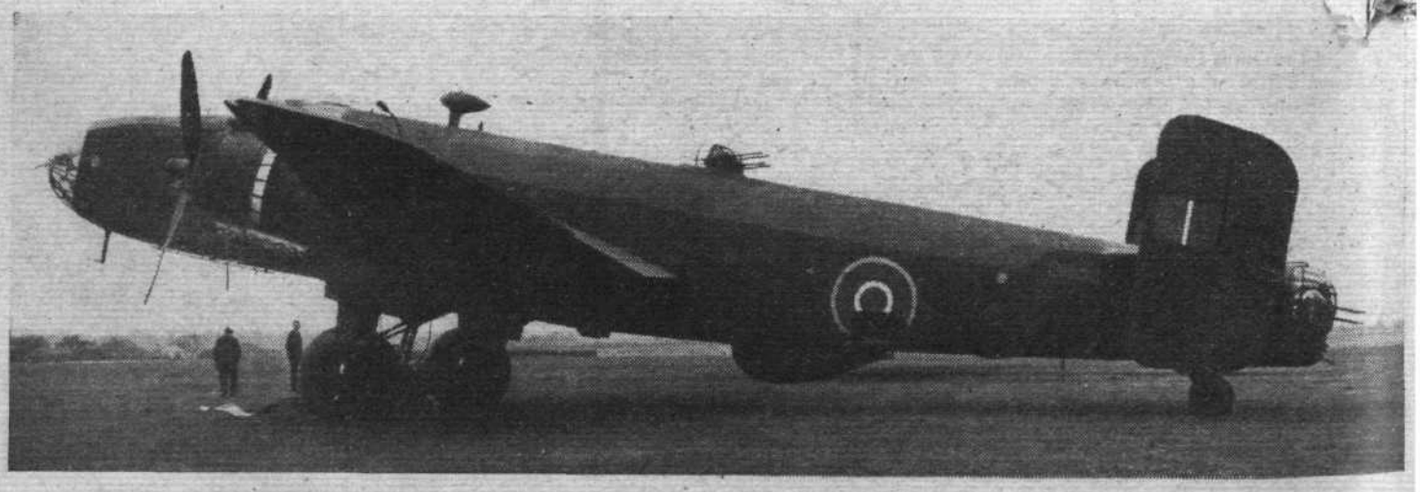
It must not be thought that Gee is a bombing instrument or system; it is purely a navigational aid by means of which the aircraft's position may be determined at any time to a fairly high order of accuracy. Briefly, the system comprises ground stations in this country which are constantly transmitting sheets of radio signals, which emanate in hyperbolic lines of individually constant signal strength over a wide area. As the separate lines of signals from, for example, station B intersect the lines of signals from station C, and as the position of each individual signal line is charted and given a number, by learning from the Gee set in the aircraft which intersection of lines obtains, reference to the chart will give the exact position of the machine.

On the cathode screen of the set are two fluorescent scales, horizontally one above the other, and both are bounded at the left end by a datum "spike" known as the A marker. Each scale is calibrated in divisions of five, the top scale being for B signals and the bottom for C signals. On these scales appear "traces" or "spikes," together with little patches of light which are called "strobes," and the operator must tune-in on his controls to bring the strobes directly beneath the trace spikes. The number of divisions from the datum A marker to the spikes are then counted and, shall we say, give whole numbers of 40 for B scale and 130 for C scale. When this is done, a switch is turned to give great magnification of the scales and traces, and the decimal fraction part of the number can then be determined. For example, we will assume that the readings obtained are B=40.74 and C=130.35. All that the navigator has then to do is look at his Gee map on which all the signal lines are printed, find where B 40.74 and C 130.35 intersect, and that is the position of the aircraft. To aid him further, B lines are printed in red on the chart and C lines in blue.

Two Miles or Less

This, then, is Gee, which, from this country, would get an aircraft to its target in Germany within an accuracy of two miles, which, however, could be bettered by a first-class operator. Needless to say, as with all radar systems, visibility or general weather conditions have no effect upon its operation. Probably the greatest advantage to aircrews was the use of Gee for homing, and for this very pleasant application the intersecting signal values at base are determined, the B signals, for instance, set on the screen, and then all the pilot has to do is fly along the particular B signal line until both the B and C signal strobes show up directly beneath the A marker. The aircraft is then directly over its base.

Following Gee, the next radar system introduced was Oboe and, to the lay observer, it is the most amazing of all. Oboe was first used by the Pathfinders to mark Essen in March, 1943, for the main bombing force. Until this raid, Bomber Command had lost 368 aircraft in attacking Krupps, but the six Pathfinder Mosquitoes which, on Oboe, dropped 24 target indicators to mark Krupps for the main



The blister on the belly of this Halifax is where the H2S scanner is housed. Usually, the rear end is Perspex although, as above, in some cases this does not apply.