

## The Great Baddow Mast

### Heritage information -

This leaflet is part of a series which aims to raise awareness of the heritage of Chelmsford



Figure 1 - Great Baddow Mast from the west

### Introduction

The Great Baddow Mast was part of Britain's early warning defence network during World War Two. As part of the 'Home Chain' network it was originally built at RAF Canewdon, south-east Essex, detecting German bombers approaching the Thames and London from the northeast. It is one of only five radar masts surviving, and the only complete example in the country. It was relocated to the Great Baddow site in around 1954 and was used for developing radar, radio and telecommunications technologies. The mast is a prominent landmark, visible for many miles. It serves as a strong reminder of the country's World War Two defences, developments in radar and the legacy of the Marconi Company. The mast is of considerable local interest and heritage value.

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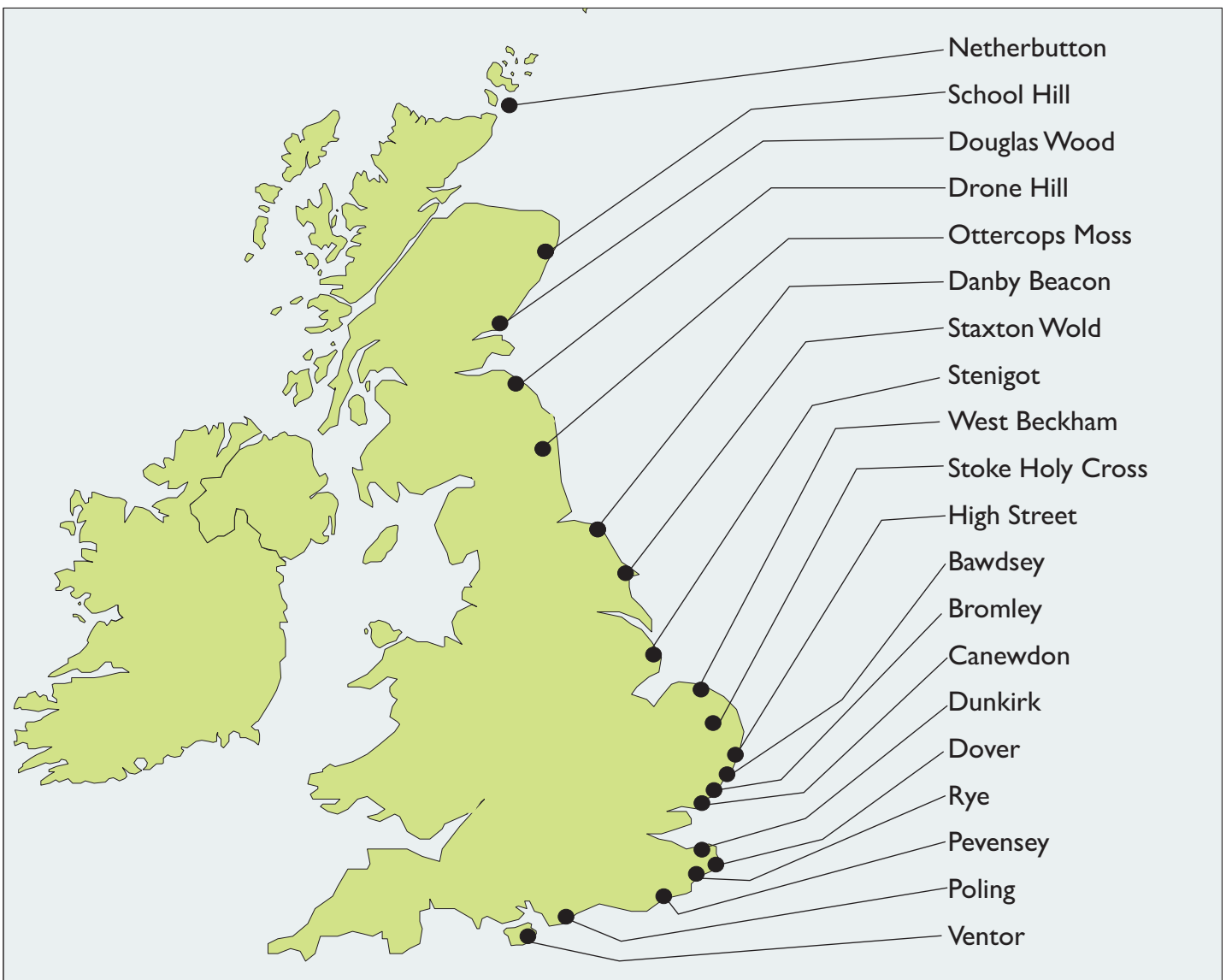
## Radar

In 1935 experiments were conducted by Robert Watson Watt to establish if an intense beam of radio waves could be used to incapacitate an enemy aircraft and its crew, effectively a large scale ray gun. It was clear that such a massive amount of power would be required to undertake the task, that at the time, it would have been impossible to achieve. However during the tests it was established that when an aeroplane passed the radio wave its presence could be detected as an echo. This led to the development of radar, which with refinement, could be interpreted to determine the distance, direction, height and number of approaching objects. Radio waves were sent out and bounced back from detected objects, received by radar stations. A detailed explanation of how the radar system worked was published in *The GEC Journal of Research* (Vol 3, No. 2, 1985, pages 73-83), reproduced on [www.radarpages.co.uk](http://www.radarpages.co.uk).

## Home Chain Stations

The Home Chain early warning network consisted of 20 sites (figure 2), from the Isle of Wight up to the north of Scotland. Each site was chosen for its low level, clear coastline and discrete position. Detection was effective to around 120 miles, with a variable frequency, which avoided enemy jamming.

**Figure 2** - Map showing the 20 home chain radar sites. The Great Baddow mast was originally located at RAF Canewdon



Each site was usually split into two halves with a transmitter block and three or four steel transmitter towers 360ft (110m) high, and a receiver block and four timber receiver towers 240ft (73m) high (figure 3).

The 'Home Chain' was a fundamental contributor to success in the Battle of Britain, allowing approaching German bombers to be detected early and the relatively small number of fighter plane squadrons to be scrambled and used effectively.

## Canewdon

The Canewdon site was the fourth to be built in the country between 1937 and 1938. One of its first operational tasks was to track Prime Minister Neville Chamberlain's flight to Munich in September 1938.

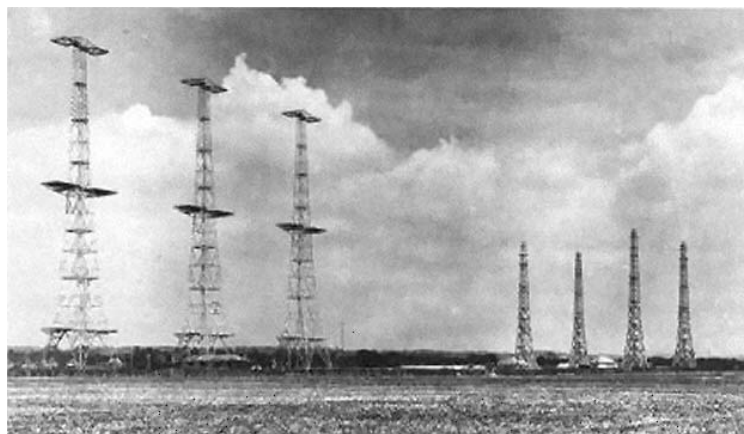
On the 6<sup>th</sup> September 1939 a technical fault and various mistakes led to friendly aircraft being plotted as an incoming raid, with two Hurricanes being shot down, mistaken as enemy aircraft. This incident, known as the Battle of Barking Creek, led to a review of the RAF's Fighter command plotting system.

The Canewdon site would have been heavily relied on as one of the main early warning sites serving the strategic defence of the Thames and London beyond. Most of the site has been cleared, but parts of the transmitter block and other remnants remain on the site, as well as many pill box defences.

When the site was decommissioned in the 1950s one of the masts was relocated to the Marconi Research Centre at Great Baddow.

## Great Baddow

The Marconi Research Centre was established on a green field site at the edge of Great Baddow between 1937 and 1939. The art deco office block (figure 4), with T-plan, north-lit assembly shops beyond, was opened in 1939, and is a rare example of this type of building in the borough. Other small scale buildings and masts were built for the experimental testing of radio, radar and telecommunications equipment. Various other buildings were built as the site expanded post World War Two, partly through funding for cold war inspired technologies, most significantly the development of the radio guidance system for the British 'Blue Streak' ballistic missile (Figure 5), developed from 1955.



*Figure 3 - A typical east coast home chain station with three steel transmitter towers and four timber receiver towers*



*Figure 4 - The 1939 art deco office building, with the mast in the background*

*Figure 5 - The Blue Streak ballistic missile developed for the cold war, operational from 1955, with a radio guidance system developed by Marconi at Great Baddow*



The most significant feature on the site is the mast (figure 6) relocated to Great Baddow in 1954. The transmitter tower is of galvanised steel lattice construction and is 360ft (110m) tall. There are six cantilevered platforms, at 50ft (15.24m), 200ft (61m) and 300ft (91.45m), which are all original and give the tower its distinctive appearance.

The mast was used as part of Marconi's contract to develop more effective air defences during the cold war, and later for the advancement of other radio technologies. It is thought to have formed part of the nation's early warning system against Russian attack in the 1950s, with 27 other upgraded masts from the Home Chain network, while a replacement system was developed as part of project *Rotor*.

The mast is only one of five surviving nationally, the only one with its full height and with all its platforms remaining. It is visible for many miles around and acts as a prominent landmark. It holds immense significance as part of the country's World War II defences, due to its latter use by Marconi and as a structure familiar to many.

### Places to Visit

- Great Baddow Mast (site not open to the public) best viewed from Vicarage Lane cemetery.
- Chelmsford Museum – Sandford Mill industrial collection.
- Royal Air Force Air Defence Radar Museum, Neatishead, Norfolk (see <http://www.radarmuseum.co.uk/>).

### Sources

RCHM (1999), Buildings of the Radio Electronics Industry Chelmsford.  
English Heritage (1997 and 2007), unpublished.  
[www.rafweb.org](http://www.rafweb.org)  
[www.radarpages.co.uk](http://www.radarpages.co.uk)



Figure 6 - The mast from the southeast

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