

[Kent County Council exploring Kent's past website](#)

The Second World War

When war with Germany was joined in 1939, allied containment of German forces by Franco-British deployments on the Continent made the possibility of invasion seem unlikely. But the defeat of the allies in June 1940 and the evacuation from Dunkirk focussed attention on the need for anti-invasion measures. This led to the creation of a defence scheme based on a 'coastal crust' of pillboxes and gun batteries, with the ports of Dover, Medway and the Thames, being given particular attention, backed by a succession of other defences inland. The latter included 'stop lines' of pillboxes, road blocks and anti-tank ditches across the countryside and the encirclement of road junctions in towns and villages with defences, all intended to impede the advance of enemy tanks and infantry and to channel him into 'killing fields' and prepared battlefields. The countryside was also obstructed with obstacles against the landing of German gliders and troop-carrying aeroplanes. Good examples of inland defences can be seen along the left bank of the Medway and across the Hoo Peninsula to Cliffe, as well as along the Royal Military Canal.



Image: Vickers machine gun pillbox, Teston

But it was air attack rather than invasion which Britain and Kent had to face, through painful experience, beginning with the Battle of Britain in the Autumn of 1940. In expectation of this, the interwar programmes for building anti-aircraft batteries and fighter airfields as well as for establishing ground observer posts, had been accelerated, with a network of batteries built to cover the industrial and military infrastructure of the Thames and Medway as well as the port of Dover. Other batteries were built near various towns. Many further batteries were added and relocated for the DIVER programme of 1944 to defend against V1 attacks on Britain. Airfields were added at [West Malling](#) and elsewhere, including emergency landing grounds. As important was the system of target detection and coordination of the air defences which had been evolved. Part of this was an enhancement of radar, down to tactical level for individual anti-aircraft batteries.

A corollary of this, was the need also to enhance civil defence which, like air defence, had been started before the outbreak of war. Most effort was in 1939-40, with the completion of the infrastructure of air raid wardens posts, first aid posts, gas decontamination centres, bases for rescue units and control centres for coordinating civil defence. At the same time, there was extensive construction of air raid shelters, both as surface blockhouses and cut and cover underground systems. In some towns, including Rochester, [Northfleet](#), Ramsgate and Dover, there were large chalk tunnel air raid shelters, which still exist. Alongside

these were the ubiquitous government-issued corrugated iron Anderson Shelters still to be found in some back gardens and the metal table-like Morrison shelter, in homes..

In 1944, Kent took part in the preparations for Operation Overlord, to liberate Continental Europe. These included the establishment of further airstrips, Pipeline Under the Ocean (PLUTO) to supply the allied armies with fuel for vehicles, several embarkation hards along the coast and rivers the formation of the deception scheme Operation Fortitude South, to convince Germany that the allies would be landing through the Calais area and not Normandy, the real destination.

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[Tonbridge Fortress - Kent Archaeological Society](#)

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In his preface, the area's brigade major wrote: 'The enemy cannot hope to succeed in subduing this country until he has established a large and secure bridgehead covering a short and well-protected sea crossing. Enemy action on invasion is likely to include parachute or airborne landings, probably at night, with the object of ... capturing aerodromes ... attacking coast batteries from the rear ... securing landing grounds ... attacking HQs; and heavy attacks by armoured and infantry formations landed by sea and directed on London'. The primary role of the area's troops were: • To hold the Fortresses, Nodal Points, Defended Localities and Defended Villages. • To

protect vulnerable points. • To maintain aerodromes intact. • To deny resources likely to be of use to the enemy, and • To locate, contain and destroy airborne troops. 'All ranks must be imbued with the offensive spirit and trained to regard the defences as: • A means of inflicting heavy losses upon the enemy in his first rush. • A means of denying to the enemy avenues of approach through which he must NOT pass. • Pivots round which reserves can manoeuvre to exploit enemy failures and temporary disorganisation. The underlying principle will be that every German who sets foot in the Maidstone Sub-Area will be destroyed. There will be NO WITHDRAWAL AND NO SURRENDER'. The battle stations throughout the sub-area (redesignated 'Maidstone Sub-District on 15 May 1943) were defined, those within the Tonbridge Home Guard battalion's district being: • Kent Fortress 2 (Tonbridge), commanded by Lt-Colonel H R Phipps and manned by Regulars and 380 Home Guards. • Kent Nodal Point 8 (Pembury), a 'strongly defended locality' capable of withstanding isolation for 3-6 days. • DL 39 (Southborough), a 'Defended Locality' less important and less strongly held than Nodal Point 8. • Eight 'Defended Villages'. where a small Home Guard force would be ordered to delay the enemy. The villages and their HG strength were: Ashurst (16), Bidborough (23), Burrswood and Groombridge (28), Five Oak Green (51), Fordcombe (26), Langton Green (27), Speldhurst (28) and Tudeley (33).

[Defence of Britain Database Anti-invasion record: S0009402](#)

British anti-invasion preparations of the Second World War ...

Lines and islands



Anti-tank cubes



Anti-tank cylinder

The primary purpose of the stop lines and the anti-tank islands that followed was to hold up the enemy, slowing progress and restricting the route of an attack. The need to prevent tanks from breaking through was of key importance. Consequently, the defences generally ran along pre-existing barriers to tanks, such as rivers and canals; railway embankments and cuttings; thick woods; and other natural obstacles. Where possible, usually well-drained land was allowed to flood, making the ground too soft to support even tracked vehicles.^[72]

Thousands of miles of [anti-tank ditches](#) were dug, usually by mechanical excavators, but occasionally by hand. They were typically 18 feet (5.5 m) wide and 11 feet (3.4 m) deep and could be either trapezoidal or triangular in section with the defended side being especially

steep and [revetted](#) with whatever material was available.^{[73][74]}

Elsewhere, anti-tank barriers were made of massive reinforced concrete obstacles, either cubic, pyramidal or cylindrical. The cubes generally came in two sizes: 5 or 3.5 feet (1.5 or 1.1 m) high.^{[75][76]} In a few places, anti-tank walls were constructed – essentially continuously abutted cubes.^{[73][77]}



Top left: 'Hair pins' at [Narborough, Norfolk](#). Top right: Sockets for a hedgehog removable roadblock on a bridge over the [Kennet and Avon Canal](#). Bottom left: Sockets for anti-tank mines on a bridge over the [Basingstoke Canal](#). Bottom right: Home Guard soldiers in York prepare a roadblock by inserting

metal girders into pre-dug holes in the road, 2 November 1941.

Large cylinders were made from a section of sewer pipe 3 to 4 feet (91 to 122 cm) in diameter filled with concrete typically to a height of 4 to 5 feet (1.2 to 1.5 m), frequently with a dome at the top. Smaller cylinders cast from concrete are also frequently found.^{[78][79]}

Pimples, popularly known as [Dragon's teeth](#), were pyramid-shaped concrete blocks designed specifically to counter tanks which, attempting to pass them, would climb up exposing vulnerable parts of the vehicle and possibly slip down with the tracks between the points. They ranged in size somewhat, but were typically 2 feet (61 cm) high and about 3 feet (91 cm) square at the base. There was also a conical form.^{[75][80]}

Cubes, cylinders and pimples were deployed in long rows, often several rows deep, to form anti-tank barriers at beaches and inland. They were also used in smaller numbers to block roads. They frequently sported loops at the top for the attachment of barbed wire. There was also a [tetrahedral](#) or [caltrop](#)-shaped obstacle, although it seems these were rare.^[81]

Where natural anti-tank barriers needed only to be augmented, concrete or wooden posts sufficed.^{[unreliable source?][82][83]}

Roads offered the enemy fast routes to their objectives and consequently they were blocked at strategic points. Many of the road-blocks formed by Ironside were semi-permanent. In many cases, Brooke had these removed altogether, as experience had shown they could be as much of an impediment to friends as to foes. Brooke favoured removable blocks.^[84]

The simplest of the removable roadblocks consisted of concrete anti-tank cylinders of various sizes but

typically about 3 feet (0.91 m) high and 2 feet (61 cm) in diameter; these could be manhandled into position as required.^[85] Anti-tank cylinders were to be used on roads, and other hard surfaces; deployed irregularly in five rows with bricks or kerbstones scattered nearby to stop the cylinders moving more than 2ft (0.60m). Cylinders were often placed in front of socket roadblocks as an additional obstacle.^{[unreliable source?][86]} One common type of removable anti-tank roadblock comprised a pair of massive concrete buttresses permanently installed at the roadside; these buttresses had holes and/or slots to accept horizontal railway lines or [rolled steel joists \(RSJs\)](#). Similar blocks were placed across railway tracks^[87] because tanks can move along railway lines almost as easily as they can along roads. These blocks would be placed strategically where it was difficult for a vehicle to go around – anti-tank obstacles and mines being positioned as required – and they could be opened or closed within a matter of minutes.^[88]



Removable roadblock buttress on the [Taunton Stop Line](#)

There were two types of socket roadblocks. The first comprised vertical lengths of railway line placed in sockets in the road and was known as hedgehogs.^{[89][90]} The second type comprised railway lines or RSJs bent or welded at around a 60° angle, known as hairpins.^{[91][92]} In both cases, prepared sockets about 6 inches (152.40 mm) square were placed in the road, closed

by covers when not in use, allowing traffic to pass normally.^[93]

Another removable roadblocking system used mines. The extant remains of such systems superficially resemble those of hedgehog or hairpin, but the pits are shallow: just deep enough to take an anti-tank mine. When not in use the sockets were filled with wooden plugs, allowing traffic to pass normally.^[94]

Bridges and other key points were prepared for demolition at short notice by preparing chambers filled with explosives. A Depth Charge Crater was a site in a road (usually at a junction) prepared with buried explosives that could be detonated to instantly form a deep crater as an anti-tank obstacle. The [Canadian pipe mine](#) (later known as the McNaughton Tube after [General Andrew McNaughton](#)) was a [horizontally bored](#) pipe packed with explosives – once in place this could be used to instantly ruin a road or runway.^{[95][96][97]} Prepared demolitions had the advantage of being undetectable from the air – the enemy could not take any precautions against them, or plot a route of attack around them.



Demolition chambers under a bridge over the [Bridgwater and Taunton Canal](#) – later filled with concrete

Crossing points in the defence network – bridges, tunnels and other weak spots – were called nodes or points of resistance. These were fortified with removable road blocks, barbed wire entanglements and land mines. These

passive defences were overlooked by trench works, gun and mortar emplacements, and pillboxes. In places, entire villages were fortified using barriers of Admiralty scaffolding, [sandbagged](#) positions and [loopholes](#) in existing buildings.^[98]

Nodes were designated 'A', 'B' or 'C' depending upon how long they were expected to hold out.^[99] Home Guard troops were largely responsible for the defence of nodal points and other centres of resistance, such as towns and defended villages. Category 'A' nodal points and anti-tank islands were usually garrisoned by regular troops.^[100]

The rate of construction was frenetic: by the end of September 1940, 18,000 pillboxes and numerous other preparations had been completed.^[101] Some existing defences such as mediaeval castles and Napoleonic forts were augmented with modern additions such as dragon's teeth and pillboxes; some iron age forts housed anti-aircraft and observer positions.^[102] About 28,000 pillboxes and other hardened field fortifications were constructed in the United Kingdom of which about 6,500 still survive.^[103] Some defences were disguised and examples are known of pillboxes constructed to resemble haystacks, logpiles and innocuous buildings such as churches and railway stations.^[102]

[Defence Archaeology - Kent County Council](#)

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Nodal points at Tonbridge and Maidstone are currently being studied (reports by P. Tritton and C. Holden forthcoming). That for Chatham is soon to begin (Smith 2019, pers comm).

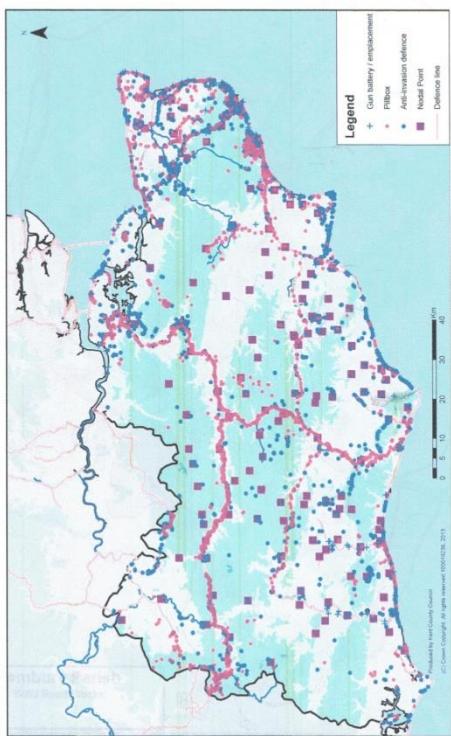


Figure 7 Second World War anti-invasion defences in South-East England (data from Defence of Britain Project)

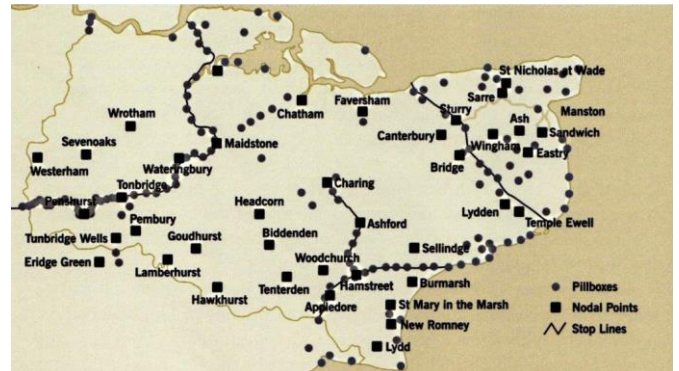


Could Hitler have captured Tonbridge Fortress? - Kent ...

This near 100 pages and refers to Tonbridge

But makes interesting reading and refers in detail to "stop lines" Rhe final

pages have links to a mass of reading that may or ma not have any reference to Pembury



Anti-invasion Results - records from 1 to 4

Overview

Nearly 600 volunteer recorders carried out the field work, making a total of some 17,000 field visits to sites throughout England, Wales, Scotland, and Northern Ireland. Other information on sites now destroyed was gathered from published works and primary archival sources, as well as through oral testimony. From September 1998, the records for data entry purposes were divided between 'Anti-Invasion' (the defence works built primarily in the period 1940-41 against threatened German invasion) and 'Non Anti-Invasion' (effectively, all the many other categories of 20th century military sites).

The CBA's Defence Areas Project, which followed the conclusion of the Defence of Britain Project, looked in detail at a number of specific 'defence areas' across England (with funding from English Heritage). This created a revised version of the original project's Anti-invasion Database, with some additional records and considerable revision and updating of many other records. The Anti-Invasion Database now contains records of 14,691 individual sites (up from 13,777 in the original Defence of

Britain Project dataset), and the Non Anti-Invasion 5778, making a total of 20,469. The original Defence of Britain Project Anti-Invasion Database is available to [download](#).

The Defence Areas Project was published by the CBA (with funding from English Heritage) in a series of reports, which included 'Beaches, Fields, Streets, and Hills: The Anti-Invasion Landscapes of England, 1940' (no. 144 in the CBA's series of research reports)

The Anti-Invasion Database invariably provides the full text of the information submitted by the recorder, although many records include photographs, plans, drawings and other information which have not been digitised: the database record indicates where this is the case. Some 2000 photographs, in fact, have been scanned into the site records to which they relate, but an estimated further 6,500 remain with the original paper records.

With the Non Anti-Invasion Database no attempt (other than for keywords) has been made to reproduce the recorders' textual descriptions, and the database will serve as an index to the paper archive to which it relates. Details of site type, grid reference, and place are given on the database, together with an indication of the extent of the record.

A handful of records of miscellaneous site types, which should more correctly be indexed on the Non Anti-Invasion Database, have received full database entry and are included with the Anti-Invasion Database.

The paper archive of the Defence of Britain Project, including the individual site records, has been deposited with the National Monuments Records of England, Wales, Scotland, and Northern

Ireland. Each NMR will eventually be able to make available for public consultation the original records of its own country [see [below](#) for information on how the records are referenced].

Searching

It is anticipated that the principal criteria for searching The Defence of Britain Project databases will be 'Site Type' and 'Place'. In addition, the full site data on a defence component listed in 'Beaches, Fields, Streets, and Hills' (the research report of the Defence Areas Project) can be obtained by entering its unique numerical reference into the relevant search field.

For the Anti-Invasion Database a precise thesaurus has been developed, which can be obtained by a drop-down menu (some terms additional to anti-invasion defences are included in this thesaurus). The thesaurus also provides information on the site type, and often a representative image.

The term 'Pillbox' has been used when the precise type of pillbox is unknown. 'Pillbox (Variant)' is used to denote a pillbox that does not conform to one of the standard referenced types and is likely to have been built especially for its site. Pillboxes which have variant features but are otherwise principally of a particular type are included under that type, and the differences noted in the site description.

For the Non Anti-Invasion Database, the site term drop-down menu is much more of a word list than a precise thesaurus. The searcher may need to use several terms relating to a particular subject to locate all the relevant site records.

When searching by Place, the enquirer using the Anti-Invasion Database will be

able to locate all place names within the location description of the site, for example a farm name as well as that of a village or town. To try to avoid duplicated or part names, it is best to include the county in the relevant search field as well.

With the Anti-Invasion database, the majority of sites have been accorded the 'strategic group' into which they fall, e.g. a pillbox on the Taunton Stop Line has been assigned to 'Southern Command: Taunton Stop Line', a pillbox protecting RAF Biggin Hill to 'RAF Biggin Hill defences', a roadblock in Worcester to 'Worcester anti-tank island', or a coastal battery on the coast of Fife to 'Fife coast defences'. A description of each Group provides further information. It is possible to enter key words in the 'Group' search field, e.g. 'GHQ' will find all the different sections by which the GHQ Line has been divided.

Of the Condition terms used, 'Unknown' means that it is not known whether the site survives or not: this is most commonly used for sites identified from documentary sources where field work has not been possible. 'Extant but condition unknown' means that the site definitely survives but that its precise condition has not been ascertained.

Please Note: Many of the sites in the database are on private land. The fact that a site appears here does not obviate the need to obtain permission before entering on private land.

Location of full paper record

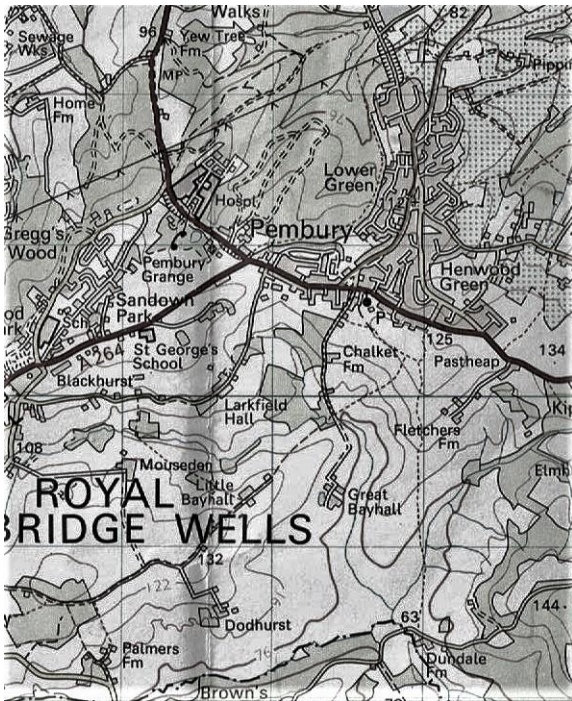
Enquirers wishing to consult the original record from which the database entry was made will need to do so at the relevant National Monuments Record for the country in question [see [above](#)]. The

paper records are filed by county/unitary authority in numeric sequence of three separate series,

- TDB - where there is a number after 'original reference' in the database record (Anti-Invasion).
- UORN - ID number commencing with S (Anti-Invasion).
- NAI - ID number only.

Your query has returned 4 record(s)
Click on the links below to see more detailed results

- [PILLBOX \(TYPE FW3/24\) \(ID: S0008300\)](#), Pembury, Kent, England
Near A264 road, Pembury, NE of Tunbridge Wells., Condition: Extant but condition unknown (Grid ref: TQ 605 403)
- [PILLBOX \(ID: S0009599\)](#), Pembury, Kent, England
Pembury., Condition: Extant but condition unknown (Grid ref: TQ 6128 4135)
- [PILLBOX \(TYPE FW3/24\) \(ID: S0008299\)](#), Pembury, Kent, England
E of Pembury, NE of Tunbridge Wells., Condition: Removed (Grid ref: TQ 626 408)
- [PILLBOX \(TYPE FW3/24\) \(ID: S0008298\)](#), Pembury, Kent, England
Near A264 road, Pembury, NE of Tunbridge Wells., Condition: Extant but condition unknown (Grid ref: TQ 605 402)



I have lifted the OS map Grid line 63 is to the west of the words Dundal Fm, 41 is just below the decender of the 'y' in the word Pembury so you can check the grid references in the list above



Horizontal section at the level of the embrasures.

Pillbox Type FW3/24 built to shell proof standard. Note irregular hexagonal plan and Y shaped internal anti-ricochet wall.



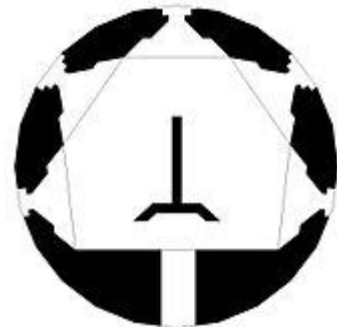
Example of a Mowlem Drum on the River Wey near Chilworth.

Type 24



Extant example near [Donyatt](#) in [Somerset](#). [ST342131](#). A part of [Taunton Stop Line](#).

[British hardened field defences of World War II - Wikipedia](#)



Horizontal section at the level of the embrasures.

Type FW3/24 built by Mowlems using circular external Shuttering.

The type 24 pillbox is an irregular hexagon in plan. The rear wall is the longest at about 14 feet (4.3 m); this has the entrance with an embrasure on either side. The other walls vary from 7–8 feet (2.2–2.5 m), each having a single embrasure. The embrasures are suitable for rifles or light machine guns.

Internally, there is a Y-shaped anti-ricochet wall (the top of the Y nearest the entrance); the internal wall also helps support the roof. The type 24 was always built to at least bullet-proof standard of 12 inches (30 cm) thick, but often was thicker. [\[20\]](#)[\[21\]](#)[\[22\]](#)

A thick-walled variant was introduced to a shellproof standard; it was larger externally and had walls 36–50 inches (91–127 cm) thick. This thick-walled variant is sometimes called a Type 29 by pillbox researchers but this is not an official designation. [\[23\]](#) In a variant on the Scottish Command Line, the entrance was moved from the long wall and the two rifle embrasures were increased in size to allow a Bren and Boys Anti-tank rifle to be mounted side by side. [\[24\]](#)

An unusual local variant of the Type 24 can be found along the River Wey in Surrey between Godalming and Albury. Known as a Mowlem Drum after the contractor that built them, these are Type 24s that have had circular external shuttering used to produce very thick walls. Internally they are identical to a standard Type 24. Most are fully circular but some still have the flat rear wall of a normal Type 24 allowing the two rear embrasures to be present. There are 25 examples of this type still extant.

The type 24 is the most common type, with more than 1724 recorded as being extant.

Dragon's teeth



[Type 24 Pillbox | The Pillbox Study Group Website.](#)



Using the base from the illustration I have sketched the band stand as I remember it, as viewed from the front of the Takeaway (Was Walkers Out - fitters at the time) i would suggest that it was set so that two firing positions could cover the road block. Has the road been widened?

