



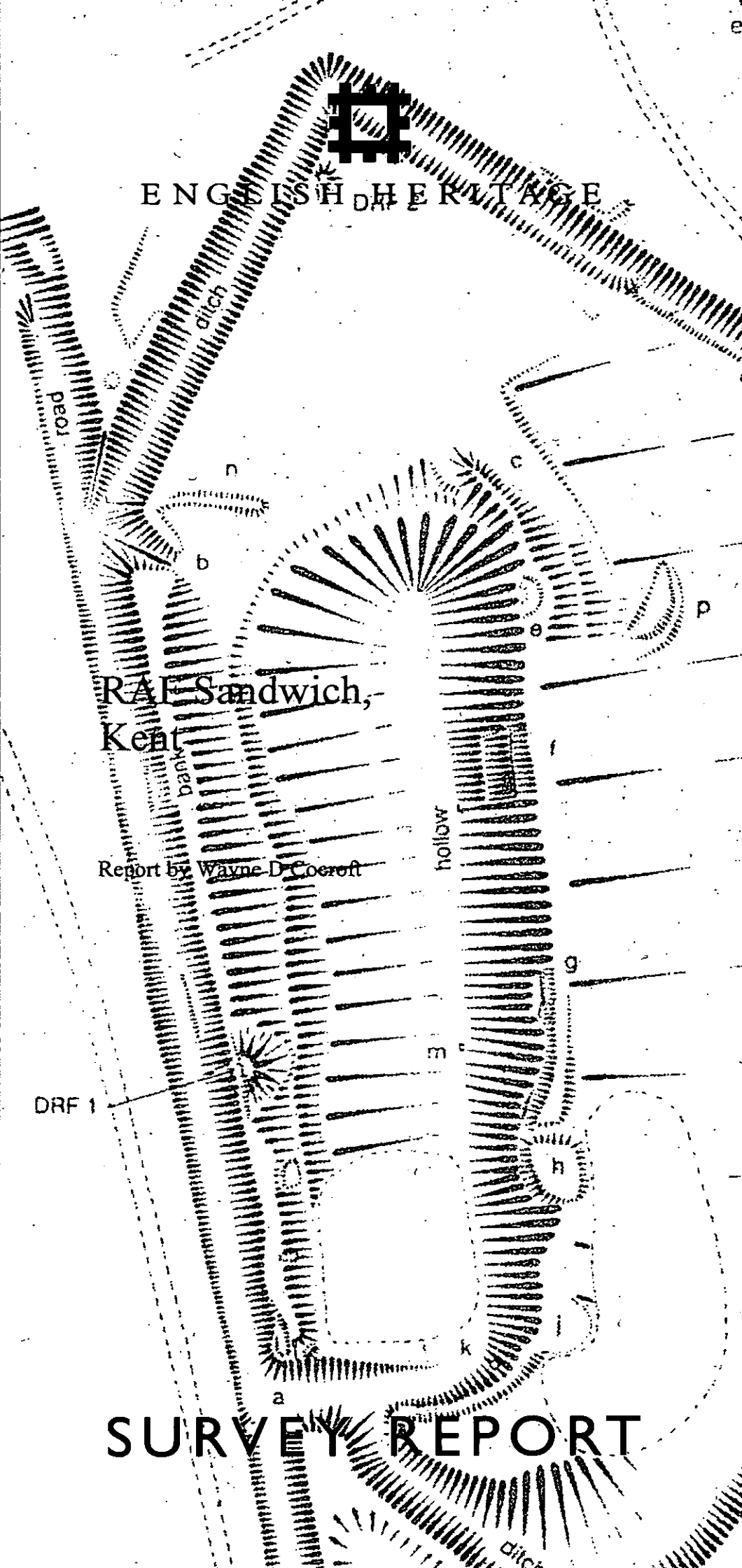
# ENGLISH HERITAGE

RAF Sandwich,  
Kent

Report by Wayne D Cocroft

DRF 1

# SURVEY REPORT



**COLD WAR PROJECT**

**SURVEY REPORT**

**RAF SANDWICH**

**Sandwich  
Kent**

NBR No:  
NMR No: TR 35 NW 173  
NGR: TR 3213 5859  
Hob UID: 1174933

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## SUMMARY

The radar station at Sandwich was established during the Second World War as a Ground Control Intercept (GCI) station. Its function was to direct interceptor aircraft to a position close enough to intruding aircraft for them to be able to use their own airborne radar to close on a target. The station was retained after the war and was extended during the late 1940s. In the early 1950s Britain's radar defences were updated and remodelled under the Rotor programme. There is evidence that the station at RAF Sandwich was refurbished before August 1953 when operations were moved 2.5km (1½ miles) southwest to a new control centre at RAF Ash (TR 25 NE 58).

The surviving field remains, including a modified wartime operations block or 'Happidrome', radar plinths and floor slabs, provide a good example of the evolution of a wartime radar station to meet post-war needs.

## **HISTORY**

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Unless otherwise acknowledged, the following account is based on the official station history as recorded on RAF form 540 (Neat 774/94). Part of this history was compiled from another official document SD0458 which described the general history of GCI stations.

### **Second World War**

At the beginning of the Second World War Britain's early warning Radio Direction Finding or radar, the Chain Home (CH) system, was strung out along the eastern and southern coasts, facing the presumed lines of approach for enemy aircraft. This system was supplemented at the outbreak of war, by the Chain Home Low (CHL) system which was able to detect aircraft flying at low altitudes (Latham and Stobbs 1996, 9-22, 48-54). CH stations were primarily designed to look out to sea for incoming intruders, and although CHL stations could scan through 360 degrees they lacked accurate height finding equipment. The weakness of the system was particularly acute in the detection of hostile aircraft at night. In late 1940 it was suggested that, to augment the coastal system, a further series of radar installations known as Ground Control Interceptor (GCI) stations should be developed. The first of these stations became operational in early 1941. In use the GCI stations were notified by the coastal stations of the course of the intruder, the GCI stations then took over tracking the intruder. In concert with the local fighter sector, GCI controllers were able to direct the interceptors to within about 3.2 km (2 miles) of an intruder, at which range the fighter's own airborne radar with a range of 4.8-8 km (3-5 miles) was sufficiently powerful to track the target.

Work on the organisation of the Ground Control Intercept (GCI) station at Sandwich began in April 1942 under the administrative control of RAF Manston. So pressing was the need to institute the GCI stations that many were initially established as mobile caravans consisting of a transmitter vehicle, a receiver vehicle, and associated radar arrays. Personnel at the station comprised 89 RAF and 154 WRAF. The radar at Sandwich was classified as Type 21, consisting of Type 13 height finding radar and Type 14 plan position search radar. Shortly before the end of the war, in March 1945, Sandwich was equipped with following radar Types 7, 11 mk II, and 21. (Historic Radar Archive). The Type 7 radar comprises a rectangular shaped rotating array. Beneath the array in the reinforced concrete engineering well, sunk into the ground, was the transmitter and receiver (Gough 1993, F3-4). The other two radar sets were mobile. The Type 11 was a standby set which worked on a 50cm (19½ ins) wavelength the same as German radar, and was therefore less likely to be jammed.

### **The Post-war period**

Sandwich was retained after the end of the war, and in 1946 was given the status of an independent RAF station. In November of that year orders were given to dismantle the mobile radar convert the site to a static station. The changeover took place in July of the following year, and by August it was operational. In 1948 it was reported that the station was equipped with a Type 7 radar to track the plan position of aircraft, a Type 14 surveillance radar and a Type 11 search radar, but no mention was made of Type 13 height finding radar. In the late 1940s the station was expanded and in 1950 RAF

Sandwich became fully operational as a Master GCI station. In the following year it was proposed that peacetime establishment would total 370 members of personnel comprising, 15 RAF officers, 9 WRAF officers, 170 RAF ordinary ranks, 174 WRAF ordinary ranks and two civilians.

### **Early 1950s Rotor programme**

By the late 1940s it was clear that the depleted wartime radar network was inadequate to cope with the threat posed by fast jet aircraft, and that the structures in which it housed in did not provide any protection against atomic weapons. In June 1950 the Air Council approved the Rotor plan to upgrade the early warning radar, to give more effective fighter control, and to provide more effective protection for personnel by placing the control and reporting centres in protected bunkers (Hartcup 1993, 228).

In February 1953 RAF Sandwich became 491 Signals Unit which became operational on 8 May 1953. The personnel at this date are listed in the Appendix. In August operations were moved from the wartime site to a new site 2.5km (1½ miles) to the southwest close to the village of Ash - this new station was known as RAF Ash (TR 25 NE 58). It is, however, not always apparent in contemporary documentation if a clear distinction was made between the two sites, or if for some time they were viewed administratively as one station. It is also unclear whether or not all operations ceased at RAF Sandwich when RAF Ash became operational, or if some of the radar were retained and information relayed to RAF Ash.

### **Radar arrays (source Neat 774/94)**

The official history lists the radar arrays that might be expected at a typical GCI(A) radar station. This list is, however, at variance with the plan drawn included in the station history and the evidence from the air photographs.

Search radar           Type 7 mk 3

                          Type 79 mk 1 with a pulse recurrence frequency (prf) of 250 and an Identifier, Friend or Foe (IFF) Type G

                          Type 14 mk 9, prf 250 with IFF Type G

                          Type 14 mk 8 with IFF Type G

Height finding radar 2 type 13 mk 6 with IFF Type A

                          3 Type 13 mk 7 with IFF

## DESCRIPTION

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The operations centre of RAF Sandwich is centred at TR 3212 5859, on a level area of land called North Poulders north of the Ash Road, which is also known as The Causeway, at 8.6m (28ft) above OD. The original extent of the site was, however, greater, with radar arrays and small buildings dispersed to the north and south of the road, and covered approximately 16 hectares (39.5 acres). Topographically it is sited in low-lying reclaimed marsh, but with rising ground to the southwest, and the Isle of Thanet to the northeast, both of which might produce adverse radar echoes.

A fairly detailed chronology of the development of the site may be reconstructed using historic air photographs, although it has not always been possible to identify the precise types of radar in use.

Air photographs (HLA/386 2-JAN-1942, frames 671-76) confirm that the radar station was set out on virgin site. Unfortunately there are no later wartime photographs which show the arrangement of the mobile and intermediate GCI station. An air photograph taken shortly before the end of the war, in January 1945 (106G/LA90 4-JAN-45, frame 4007), shows final form of the station. The final GCI operations block or 'Happidrome' is sited at TR 3212 5859; it is a single storey brick building with a flat concrete roof and survives converted into a veterinary surgery. To meet its new role it has been refenestrated, a number of the wartime windows being blocked. The water tank has also been removed from the roof, and the chimney above the heating boiler lowered. Immediately to the east, at TR 3219 5859, is a brick building which probably housed the standby generators. West of the 'Happidrome', on a site now covered by a garden centre, were three small huts with pitched roofs. The Type 7 radar may be identified at TR 3189 5867: its engineering well survives intact and appears as a flat concrete slab with metal plates sealing the entrances to the well. To the northeast of the 'Happidrome' at TR 3220 5872, is the Identifier Friend or Foe (IFF), comprising a small square brick building with an L-shaped blast wall protecting its door, and adjacent to it the IFF mast. The brick building survives intact. To its northwest two small features which correspond to the positions of two small brick electrical junction boxes may be seen on air photographs, these also survive. Between these features and the Type 7 radar, three small features may be seen which are probably the positions of radar arrays. In the corner of the field, at TR 3203 5872, where a concrete footing survives, the shadow of the array on the air photograph suggests the mounting for a Type 13. To the south of the 'Happidrome', at TR 3208 5844, is another radar array, which was probably the Type 14. Also south of the road, at TR 3193 5854, is an unidentified hut. Both these sites south of Ash Road now lie in arable fields. Photographs taken in early 1946 confirm this lay out although it is not clear if any of the arrays had been dismantled (106G/UK1110 10-JAN-1946 frame 4049; 106G/UK1178 20-FEB-1946 frame 3028). Some run down of the wartime station is, however, evident in the loss of the building south of Ash Road.

By late 1949 the site had been considerably expanded to create a GCI Master Station. The plotting room of the wartime 'Happidrome' was enlarged by the addition of an L-shaped extension wrapped around its south-west corner. This extension is clearly visible as a straight joint in the eastern wall of the operation room of the 'Happidrome' wall. To its rear a single storey hut was built parallel to it together with six temporary huts. One of the latter survives in reconstructed form, but the remainder have been demolished. Fortunately, the station history (Neat 774/94) includes a diagram of the

radar arrays at this date. The late 1940s lay out is confirmed by a contemporary air photograph (541/388 10-NOV-1949 frame 4057). The pattern of the arrays appears to be little different from the arrangement in 1946. The Type 7 remains in place at TR 3189 5867, and to its north were three Type 13 mk 6 radars, numbered 1-3 from east to west. To the north of the 'Happidrome', at TR 3214 5874, was Number 1, the position of which is marked by concrete footings. In the corner of a field, at TR 3203 5872, was Number 2, also marked by concrete footings. Number 3 was located to its northwest, at TR 3198 5879, here the concrete footings are clearly visible and appear to be those for a wartime Final GCI Type 13 mk II height finder (Radar Bulletin 1945, 26). The IFF to the northeast of the 'Happidrome', at TR 3220 5872, is identified as an IFF mk 10, and the radar to the south of the 'Happidrome', at TR 3208 5844, is verified as a Type 14 mk 7 search radar on a 25 foot gantry (541/513 10-OCT-50 frame 4017).

The next available photograph of the station does not occur until August 1954, a year after the new centre at RAF Ash became operational (82/1006 31-AUG-1954 frame 0007). The Type 7 radar is still in place, it is unclear from the photograph if the Type 13 arrays remain. In the intervening period, between 1950 and 1954, a further scanning array had been constructed adjacent to the Type 7, at TR 3188 5869, with a metal track leading to it off Ash Road. The engineering well of this array survives as a rectangular concrete feature, with metal plates sealing the opening to the well and small metal vents projecting up through it. It was perhaps during this period that the Type 13 radar Number 3 was placed on a new plinth adjacent to its old position. This new plinth, at TR 3196 5877, is a standard Rotor period plinth and is a small square building with a flat concrete roof and has a single sliding metal door which can be filled with sand to resist blast damage.

It is not known when the site of RAF Sandwich was relinquished, or if the radars were maintained beyond August 1953. Some minor expansion at the site may be recognised beyond August 1954 a timber-framed asbestos hut to the northwest of the 'Happidrome', at TR 3211 5863. To its north, was built a steel framed asbestos hut with tubular steel roof trusses, at TR 3215 5864. Both these structures remain in derelict condition. When the Ordnance Survey mapped the site in 1969 most of the buildings survived, but a decade later there had been some loss of the temporary huts to the rear of the 'Happidrome' (MAL/79004 1-MAR-79 frame 150). Subsequently, the eastern end of the 'Happidrome' has been converted into the White Mill Veterinary Centre and the western end (which housed the operations room) into a garage.

### **Summary of surviving field remains**

The field remains of RAF Sandwich provide a good example the evolution of a wartime radar station to meet the needs of the early Cold War period. In the remains we may recognise the remodelling of the station in the late 1940s to create a Master GCI Station in 1950, before Britain's radar network was reorganised under the early 1950s Rotor programme. This remodelling is represented in the fabric of the 'Happidrome', where the vertical joint between the wartime building and later extension is clearly visible. In the fields to the north of the 'Happidrome' all the late 1940s radar plinths survive as field monuments and may be precisely identified from a contemporary plan. The most notable loss is the position of the Type 11 radar in the arable field south of the 'Happidrome', at TR 3208 5844. These remains would, however, have been slight, comprising four concrete feet for the steel gantry.



## **ACKNOWLEDGEMENT**

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We acknowledge the assistance of The Air Defence Battle Command and Control Museum, RAF Neatishead, Norfolk for use of their archives, which provided background material for the compilation of this account.

## SOURCES

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### Primary

#### Air Defence Command and Control Museum, RAF Neatishead, Norfolk

- Neat 774/94            A chronological history of RAF Ash
- Neat 1997/169        *Outline plan for the organisation, equipment, operation and manning of the UK control and reporting system in 1958* FC/TS 48547/plans 26th July 1956

#### Air photographs consulted, held by NMR Swindon

- HLA/386 2-JAN-1942, F21, frames 671-76
- 106G/LA90 4-JAN-45, RS, frame 4006
- 106G/UK1110 10-JAN-1946, RS, frame 4039
- 106G/UK1178 20-FEB-1946, RP, frame 3028
- 541/388 10-NOV-1949, RS, frame 4057
- 541/513 10-OCT-50, RS, frame 4017
- 82/1006 31-AUG-1954, F61, frame 0007
- MAL/79004 1-MAR-79, V, frame 150

#### Ordnance Survey plans

- TR 3158, TR 3258 1969

### Secondary

- Bullers, R F. 1991. *We guard the skies Royal Air Force Neatishead - a history*, privately printed
- Hartcup, G. 1993. *The silent revolution - Development of conventional weapons 1945-85*, Brassey's
- Historical Radar Archive. nd. map *The Home Chain March 1945*
- Latham, C and Stobbs, A. 1996. *Radar a wartime miracle*, Alan Sutton Publishing Ltd
- Radar Bulletin*. 1945. (reprinted by the Historical Radar Archive 1991)

## Appendix Establishment in 1953

	RAF	WRAF
Fighter controllers	7	6
Radar supervisors	1	1
Signals	2	
Ground radar fitter	1	
Ground radar fitter (B)	5	
Ground radar fitter (B) tech	7	
Ground radar Mech (CMS)	7	
Ground radar Mech	2	
Ground wireless fitter	4	
Ground wireless fitters (Tech)	4	
Ground wireless fitter (Cnmd)	5	
Radio assistant	1	
Telegraphist II		2
Teleprinter operator		1
Telephone supervisor		1
Telephonist I		1
Telephonist II		7
Telegraphist assistant	1	
Fighter controller operator	1	
Fighter control operator fighter plots	2	5
Fighter control operator radar operator	10	4
Fighter plotter	9	45
Radar operator	3	2
Radar operator (?)	20	?



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