

COLD WAR PROJECT

SURVEY REPORT

RAF ASH

Ash Kent

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CONTENTS

1

Summary	1
History	2
Ground Controlled Interception	2
Rotor period Radar Station	3
Radar arrays	4
The late 1950s	5
Background to remodelling RAF Ash in the late 1980s	6
Description	7
Surface features	7
R3 Bunker	8
Domestic Site	9
Acknowledgement	9
Sources	10
Primary	10
Air Defence Battle Control and Command Museum	10
Central Office of Information NMR Collection	10
Air photographs consulted, held by NMR Swindon	10
Secondary	10
Appendix	
'The safest property in Britain300ft down' The Sunday Telegraph 30 November 1997, 16	

i

SUMMARY

The radar station at RAF Ash was constructed in the early 1950s as part of the RAF's Rotor programme to modernise Britain's radar defences. It became operational in August 1953 and succeeded an earlier wartime radar station, RAF Sandwich (TR 35 NW 173). Its function was similar to its wartime predecessor as a Ground Control Intercept (GCI) station - to direct interceptor aircraft to a position close to intruding aircraft, from where the fighters could close on the target using their own airborne radar. During the 1960s it became part of the civil air-traffic control network, but by the late 1980s the site was fully reoccupied by the RAF.

The site consists of a buried double-storey bunker known as an R3 - one of ten such bunkers built in Britain. Above ground features include vents for the bunker, ancillary buildings and radar plinths. At the time of the investigation, in February 1998, the station was for sale.

HISTORY

Unless otherwise acknowledged, the following account is based on the official station history as recorded on RAF form 540 (Neat 774/94).

Ground Controlled Interception

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 operation the GCI stations were notified by the coastal stations of the course of the intruder; the GCI station then took over tracking it. In concert with the v local fighter sector, GCI controllers were able to direct the interceptors to within about 3.2 km (2 miles) of an intruder, from which point 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 (TR 35 NW 173) began in April 1942 under the administrative control of RAF Manston. The station was retained after the end of the war and in 1946 it was given the status of an independent RAF station. In November of that year orders were given to dismantle the mobile radar convert it to a static station. The changeover took place in July of the following year and by August the new system was operational. In 1950 RAF Sandwich became fully operational as a Master GCI station.

Rotor period Radar Station

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 the wartime radar buildings did not offer any protection against atomic weapons. In June 1950 the Air Council approved the Rotor plan to up-grade the early warning radar and give more effective fighter control; it also aimed to provide protection for personnel by placing the control and reporting centres in protected bunkers (Hartcup 1993, 228). It was an enormous programme, which in addition to the construction of protected structures also demanded a new communications network and the installation of 1620 display consoles. The plan was split into four principal construction phases carried out between 1951 and 1954, although the majority of the stations were commissioned by the end of 1953 (Wood 1992, 204). The plan called for the construction of twenty-five GCI stations, of which eleven were housed in underground structures while the remaining fourteen were accommodated in semi-submerged structures. In February 1953 RAF Sandwich became 491 Signals Unit the new unit becoming operational on 8 May 1953. In August operations moved from the old wartime site to the new site which was known as RAF Ash (after the adjacent village). 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. The control block at RAF Ash was designated an R3 type bunker, a doublestorey underground bunker with 3.0m (10 ft) thick reinforced concrete walls. It was approached through a tunnel from a cottage-like guardhouse. Internally it was arranged around a square operations well, 12.2m (40 ft) across. This was fitted out with situation map tables and a fighter tote display, and was overlooked on two levels by glass-fronted cabins. The operations room at RAF Ash was equipped with nineteen Type 64 plan position indicators (PPI), with provision to fit a further three units, five Type 61 height and range displays for use with the Type 13 signals, and six Type 65 height and range displays for use with the Type 7 signals. Also fitted were three visible marker units, six radiotelephone (R/T) recorders (long), one timing unit, four R/T recorders, a photographic PPI projector system and large scale viewing PPI.

The main contractors for the construction work were the Demolition and Construction Company, who also built the bunker at Langtoft, Lincolnshire. The total cost of the technical facilities was $\pm 500,000$, a further $\pm 400,000$ was spent on an associated domestic site, and before July 1956 an additional $\pm 92,000$ was spent on modifications to the site (Neat 1997/169, Appendix N).

Radar Arrays (source Neat 774/94)

The station was designated a GCI(A) station and was fitted with the following radar:

Search radar Type 7 mk 3

Type 79 mk 1 with a pulse recurrence frequency (prf) of 250 and an Identification, 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 radar2 type 13 mk 6 with IFF Type A

3 Type 13 mk 7 with IFF

The Type 14 and Type 13 radars were mounted on gantries or plinths and together constituted a Type 21 radar. In October 1954 IFF mk 10 was installed. The station was also equipped with one American AN-FPS-3 search radar, which was operational on 4 March 1955, but was not integrated with the Rotor station. This was a long range search radar with a 321.8 km (200 mile) range, compared to the 90 mile 144.8 km range of the British Type 7 (Bullers 1991, 23-4). Also in 1955 two additional VHF channels were installed, making in total four. In August 1956 an AN-FPS-3 was relocated from the store to RAF Neatishead, Norfolk and in September two FPS-6 height finding radar were under construction at Ash.

The late 1950s

The Rotor scheme was relatively short lived. With the advent of faster jet aircraft it was found that the manual control and reporting, and filtering systems, used to pass information up to the Sector Operation Centres were too slow. Technological advances in radar, in particular the introduction of the powerful Type 80, with a displayed range of 386 km (240 miles) and a maximum range of 515 km (320 miles), also meant that fewer radar stations were needed. Under a new scheme, initially known as the '1958' plan, it was to proposed to revamp the United Kingdom's radar defences. This plan emerged in 1959 as a system called Plan Ahead, which was intended to be a centralised and fully automated air defence system to meet the threat from manned bombers. In addition it was to co-ordinate Lightning interceptor aircraft and Bloodhound surface to air missiles, which were coming into service. It was, however, too ambitious for existing computer and data transmission hardware, and with fears of escalating costs Plan Ahead was scaled down in 1961 under a scheme known as Linesman/Mediator (Hartcup 1993. 31). This was a comprehensive plan to integrate air defence and air traffic control -Linesman referred to the air defence aspects and Mediator to the air traffic control aspects (Gough 1993, 224).

Under the new plan RAF Ash was to become a satellite radar station. To provide the best possible information it was to be equipped with a variety of radar types. The proposed equipment was to consist of search radars, one Type 80 mk 3, one AN-FPS-3, one Type 7 mk 3, and height finding radar six Type 13 mk 6/7 and two AN-FPS-6. The R3 control block was to be reorganised to house twenty-nine consoles with a maximum of eight control positions to oversee Interception control, height finding, DRW reporting, aircraft reporting, surface vessel tonnage assessment, surface reporting and radar office monitor (Neat 1997/169, Appendix C, Appendix D). Additionally the station was to be equipped with a VHF transmitter for communication to the fighters. In 1956 the establishment comprised 27 Officers, 45 senior non-commissioned officers, and 350 corporals and aircraftsmen. The new scheme proposed that the establishment should be reduced to 25 Officers, 49 senior non-commissioned officers, and 206 corporals and aircraftsmen. The cabin crew would comprise:

		Peacetime	Wartime
Sqdn Leader	Satellite CO	1	1
Sqdn	Chief controller	1	1
Flight Lt/Flying Officer	Interception controller	12	16
Senior NCOs	Interception control assistants	12	16
Junior NCOs	Cabin supervisors	6	8
Aircraftsmen	Cabin crew	36	48

(Neat 1997/169, Appendix N).

It is not known if work started at RAF Ash to adapt the station to its new role as a satellite station or whether this programme was overtaken by a new scheme in the early

1960s to convert it to a civil air traffic control station. Under the air traffic plan, Mediator, it was proposed that Ash would be operational from December 1962 and that its primary radar would comprise two Marconi T264A radars and a SSR (secondary surveillance radar) (Gough 1993, 261). The history of RAF Ash from the early 1960s to late 1980s is obscure.

Background to remodelling of RAF Ash in the late 1980s

The alteration in the role of RAF Ash in the early 1960s reflected a change in defence planning which saw the role of Fighter Command, supported by early warning radar, to ensure the safety of the nuclear deterrent on the V-Bomber and Thor bases. Once the deterrent had been launched no further action was thought to be necessary. But in the late 1970s NATO policy changed to the concept of a *Flexible Response*, where it would initially attempt to contain any Soviet attack by conventional means.

Under this new strategy the survival of the country's radar defences was vital. Elsewhere during the 1960s, radar operations had been placed in large concrete surface bunkers, usually adjacent to their radar arrays but such a system was very vulnerable in a sustained attack. In an attempt to make the system more resilient, new 90-series mobile radars were developed. These were generally operated from a main site, but could quickly be dispersed to alternative pre-surveyed sites to make them less easy to detect in times of tension. Renewed interest was also shown in a number of Rotor period bunkers, which could be remodelled to meet a new role as control rooms for the Improved United Kingdom Air Defence Ground Environment (I-UKADGE). This is a fully automated and computerised system which is able to move data by land-line and microwave links between mobile and fixed sites. This flexibility would allow the work of a disabled bunker to be carried out many hundreds of miles away.

RAF Ash was the first Rotor period bunker to be refurbished, and played an important part as an Operational Conversion Unit for personnel being trained to use the new equipment. Also in its last few years it was used to test new air defence related software. RAF Ash lay in UK Air Defence Sector South. Its operational role was to act as a reserve station for the main South Sector Operations Centre (SOC) and Control and Reporting Centre (CRC) at RAF Neatishead, Norfolk which became operational in a converted R3 structure in April 1993 (Jackson 1993, 11-14). RAF Ash was unique amongst the four primary SOCs and reserves in that it did not have any radar of its own. RAF Ash remained operational until summer 1997, when most of the control desks and associated equipment were removed (Birkett 1997, 16). At the time of the investigation in February 1998 the station was for sale.

DESCRIPTION

Topographically RAF Ash is sited on a locally prominent hill top at 30m (98ft) above OD and it is comparatively small in area and covers about 8 hectares (19.8 acres). From this position it was able to command the Thames Estuary and the Strait of Dover. The move from the reclaimed marshland at Sandwich was probably to overcome the problem of radar reflections from the Isle of Thanet to the northeast, and rising ground to the west. The station is enclosed by a wire mesh fence supported by concrete post with out-turned tops supporting three strands of barbed wire, recently supplemented by coils of razor wire. The legal boundary of the site is delineated by cast concrete Air Ministry markers.

Early post-war photographs show that RAF Ash was constructed on a virgin site with no indication of prior military activity (106G/UK1178 20-FEB-1946 frame 4038; 541/480 7-APR-1950 frame 3094). On the later photograph the future site of RAF Ash was delineated in blue pen. An air photograph taken in the month that RAF Ash became operational shows that five radar arrays were in position on the site, one on top of the bunker and four to its west (V58 RAF1195 10 AUG 1953 frame 0029). This may suggest that some of the radars at RAF Sandwich were retained, and were used to feed information to the new bunker.

Surface features

In plan the site is a jagged hourglass in shape, and it is convenient to describe the surface features in the northern part and then the southern part of the site. The entrance to the site is at its north-east corner. Opposite the main gate is the Rotor period Guard House, TR 3004 5759. It was originally of a standard form, which resembled a bungalow, with a pitched roof and flat roofed veranda to the front. In its present form it has been modified by the removal of its pitched roof, while on its north-west elevation an administrative and maintenance building has been attached, probably after the station was converted to a civil function in the 1960s. At the rear of the bungalow a stair-case originally descended to a tunnel leading to the R3 bunker. To the rear of the Guard House is a three-bay garage. Also behind the Guard House, and commanding the entrance to the site, is a Yarnold type pillbox erected during the 1980s to counter any terrorist threat.

To the northwest of the Guard House is a small sewage works with 2 filter beds, and an electricity sub-station; both of these features date from the early 1950s. Behind the Guard House is the grass covered mound over the R3 bunker. Emerging from the mound are a number of vents - the four above the original bunker are lettered A-D, and the three above the new extension are lettered X-Z.

In the western corner of the site is a small square radar plinth with a single door in its eastern elevation, TR 29910 57525. Its last function caused it to be marked RF (radio frequency) Hazard. To its southeast, at TR 2988 5757, is building 16A. This building is a truncated U-shape in plan, and is single-storeyed. On its main south-east elevation are two projecting arms; a single door leads into the south-west arm and a double door into the north-east arm. A steel stair mounted on the front of the building gives access onto the roof. In the centre of the roof is a square shaped projection, over which a radar was mounted. It is probable that this building housed the SSR (secondary surveillance radar). To the southwest of this building a concrete fire pool was added during the late 1980s refurbishment.

In the southern part of the site the most distinctive features are two circular radar plinths on the crest of the hill, 18A to the south (TR 29915 57365) and 17A to the north (TR 2987 5744). These are brick built and comprise a ground floor storey with alternating glazed and brick panels. The upper storey is smaller and is cement rendered with small square windows. A balcony above the ground floor is protected by a wooden barrier. These plinths were probably erected during the early 1960s to mount the Marconi T264A radars.

At the southern corner of the site is the Type 80 radar modular building 5A, TR 2988 5728. This is a brick, single-storey, three cell structure, comprising at its eastern end the modulator room; above, the radar was mounted on a steel gantry over the building - the footings for the gantry survive as concrete pads 1.5m (5ft) square. This room was linked by a short corridor to the generator room at the western end of the building. This was installed at the end of 1956 (Gough 1993, 155). The only other building in this area, in the southwest corner of the site, is the single-storey Communications Workshop 14A (TR 2981 5725). A steel stair on its northern elevation gives access to its roof, and at the foot of the stair is the concrete base of a small radio mast.

Minor features in this area include concrete footings for a radio mast in the eastern corner of the site at TR 3006 5733. To the northeast of radar plinth 17A are the footings for a wireless mast (TR 29895 57465) consisting of a central square block with three concrete blocks for wire ties arranged around it in a circular pattern. A modern addition in this area is a small fenced enclosure containing a microwave tower at TR 2996 5743.

R3 Bunker

The effects of the detonation of a nuclear weapon may be broadly categorised as blast, radiation, fire and an electromagnetic pulse. The design of the bunker had to be sufficiently robust to withstand all these threats. The bunker is a standard R3 structure comprising a double-storey underground bunker, and is rectangular in plan, with a detached guard house. In construction, the lower level of the bunker is below the original ground surface, while the upper storey is covered by an earth mound. The structure is also equipped with an electromagnetic pulse shield to shield its electrical circuits. As described above it was originally entered from the Guard House at the north-east corner of the site. However, in the late 1980s the bunker was remodelled internally and a major new extension constructed primarily to house a standby generator and air conditioning plant. At this date a new entrance was created at the eastern end of the bunker. Here there is an angled concrete wall, set into this wall is the recessed pedestrian entrance to the bunker protected by a steel blast door, to its south is a wider flush blast door for moving plant into the maintenance area. Entrance through the pedestrian door leads in an outer lobby, from which access into the bunker is through a turnstile controlled from the adjacent guard room. A door from the outer lobby also leads to the maintenance area. From the turnstile a short passage leads to steel stairs which descend to the entrance tunnel leading to the bunker. Behind the maintenance area is a well, over which is a hoist to lower large equipment into the bunker. At the base of the stairs a tunnel leads straight on to the new extension housing plant rooms,

while a short tunnel leads off northwards to the old R3 bunker. The R3 bunker is entered through 2 steel blast doors. In the short corridor between the blast doors a single door gives admission to the Chemical Contamination Area, access to which is through a single short passage way with a metal grilled floor overseen through a glass panel from the security room. At the opposite end of the passage a door leads into an outer undressing room, equipped with open metal lockers for contaminated clothing. From this room progress is through further undressing rooms, showers, on to the clean clothing room and then out into the main entry corridor past the security room.

Internally the R3 is divided into two uneven parts by longitudinal corridors, one above the other running the length of the structure. Staircases at either end give access to the lower level. Beyond the further set of stairs a corridor leads to an emergency exit up a steep flight of stairs. In its original configuration the operations room consisted of a double-storey well 11.9m x 8.8m (39 ft x 29 ft) overlooked by control rooms on both levels. In the late 1950s this was sealed by a suspended floor to create an upper and lower control room. This arrangement was retained by the 1980s refurbishment in which an upper and lower operations room were created. On the upper level other rooms were used as offices, rest rooms and a canteen; on the lower level other rooms boused air conditioning plant, and telephone relay rooms.

Access into the new section of the bunker is straight along the corridor from the modern entrance through steel blast doors. Steel stairs lead down from the corridor into the main Air Inlet Shaft, at the opposite end is a vertical shaft which draws down air from a surface vent. On one side of the shaft, at the foot of the stairs from the entrance passage, a steel blast door gives access to a filter room. On the opposite side of the Air Inlet Shaft are a series of rectangular openings which allow air to pass into the Intake Plenum room, in which are large fans to drive air into the generator hall. If the bunker was subjected to nuclear attack large quantities of heated air would be required to do the work of air at normal temperatures and cool the standby diesel generators. In the Generator Hall three concrete plinths for diesel generators were constructed during the refurbishment, but the generators were not installed. On the opposite side of the Generator Hall is the Extract Plenum room; beyond is an emergency escape corridor. Returning to the Air Inlet Shaft, a steel gas proof blast door adjacent to the inlet openings gives access to the generator and air conditioning plant control room. From this room there is also access into the Generator Hall and the emergency exit tunnel adjacent to the Plenum Extract room.

Domestic site TR 35 NW 174

To house some of the personnel at the station an RAF housing estate was built at Sandwich between 1950 and 1954 (541/1599 27-JUL-1950 frame 4074; 82/1006 31-AUG-1954 frame 006). The estate is located to the north of Sandwich on the east side of Ramsgate Road centred at TR 3339 5853 and is marked as RAF Station Sandwich by the Ordnance Survey. It covers approximately 4.5 hectares (11 acres) and comprises 16 pairs of semi-detached houses built around Stonar Close and 8 detached houses on Stonar Gardens. It is understood that Stonar House was used as a mess. The roads are tree lined and the whole estate is surrounded by a wire mesh fence. The estate, along with other MOD housing, was sold to a private company in the early 1990s, and most of the houses were vacant at the time of survey. Additional accommodation was also available at RAF Manston 10 km (6.2 miles) to the northeast of RAF Ash.

ACKNOWLEDGEMENT

We acknowledge the assistance of Mr Hall, Defence Estates Organisation (Lands) for facilitating access to the site.

We are also grateful to 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

Primary

ADBCC 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

Central Office of Information (NMR Collection)

Radar Building Ash, Kent 942.23

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The safest property in Britain... 300ft down

by PETER BIRKETT

IT MUST be the safest property ever to come on to the with top-secret radar trackmarket in Britain.

bunker 500ft below ground to key part of the UK Air protect you from nuclear Defence Environment-senattack, biological warfare sitive fighter control stations and bombardment by elec- all over Britain. tronic beam weaponry.

beneath the Kent country-side, you will have plenty of requirements. The air-condispace in 78,000 sq ft of heavily tioned bunker with 18 acres reinforced accommodation above it, surrounded by with miles of corridors and razor-wire fencing, is huge underground chambers.

RAF Ash, most recently used as a test-bed for military computer software, has defence cuts and now proeccentric, property buyer.

of a Dr No-style hideaway by a hydraulic winch: will be disappointed. Pro-

spective buyers will be carefully vetted. Until last summer. RAF Ash was packed ing equipment costing the For £250,000 you can buy a taxpayer millions and was a But in July the Ministry of

Despite the lack of sunshine Defence announced that it redundant.

The complex has a "core" area capable of being pressurised to keep out radiation fallen foul of Government or residues from chemical weapons. Most of this area is vides a unique opportunity lined with three-metre-thick for the adventurous, if not concrete and its hydraulic doors are made of heavy But anyone with delusions steel. Supplies are lowered

Weatherall Green & Smith,



the London estate agents. said the bunker has an "electromagnetic pulse shield" and a "zonal" fire detection station and a modern office floors are just skimmed conand control system.

It has a fire station, sewage nications masts. Bernie Hall, Part of it is cellular flooring, safe environment -- the sort register of assets and it is up

like a cross between a power machinery space where the block

paper store and two commu- concrete box in the ground. like to describe it as a very added: "We have prepared a are still there," said Mr Hall.

of the Defence Estates Orga- ducted for computers and car- of place where you won't be to the purchaser what he nisation, said the bunker is pet-tiled but there's lots of disturbed by neighbours." The bunker comes with a self-service cafeteria where, crete. But there's no luxury said Mr Hall, there is a mi-"The only drawback is that here, you have to remember crowave oven and kitchen the two control rooms. works, officers' mess, dining there are no windows," he that it is a Cold War bunker sink with "numerous bits of They've had all their equiparea, surface office building, said. "What you've got is a with an important job to do. 1 catering equipment". He

wants to keep."

But secret equipment has been removed, leaving "a few residual control desks in ment removed but the desks The selling price is said to

be open to negotiation but the MoD, aware that the bunker is not everyone's cup of tea, is thought to be prepared to accept £250,000.

The site, built in the Fifties, was refurbished by the MoD in the Sixties with tracking equipment to combat a Soviel air attack on Britain. Ten years ago it was extended and has since been used as an important testbed for the software which controls the nation's air defence computers.

Weatherall Green & Smith describes the bunker as "suitable for a variety of uses including specialist storage and communications research and development" As a hedge against any prospective Dr No, it states: "A conditional offer should be fully supported by full information of the proposed use."

ENGLISH HERITAGE NATIONAL MONUMENTS RECORD

The National Monuments Record is the public archive of English Heritage. It contains all the information in this report - and more: original photographs, plans old and new, the results of all field surveys, indexes of archaeological sites and historical buildings, and complete coverage of England in air photography.

World Wide Web: http://www.english-heritage.org.uk National Monuments Record enquires: telephone 01793 414600 National Monuments Record Centre, Great Western Village, Kemble Drive, Swindon SN2 2GZ

