# RAF Bawdsey, Bawdsey, Suffolk

Roger J C Thomas, drawings by Allan T Adams

HISTORIC BUILDING REPORT

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**RAF Bawdsey (AMES 24)**
**Bawdsey Manor**
**Bawdsey**
**Suffolk**

**October 1995**
**Fully revised 1999**



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ROYAL COMMISSION ON THE HISTORICAL MONUMENTS OF ENGLAND

**Suffolk** **NBR No.: 95120**

**Bawdsey** **NGR: TM 3412 3828**

**Bawdsey Manor**

**RAF Bawdsey (AMES 24)**

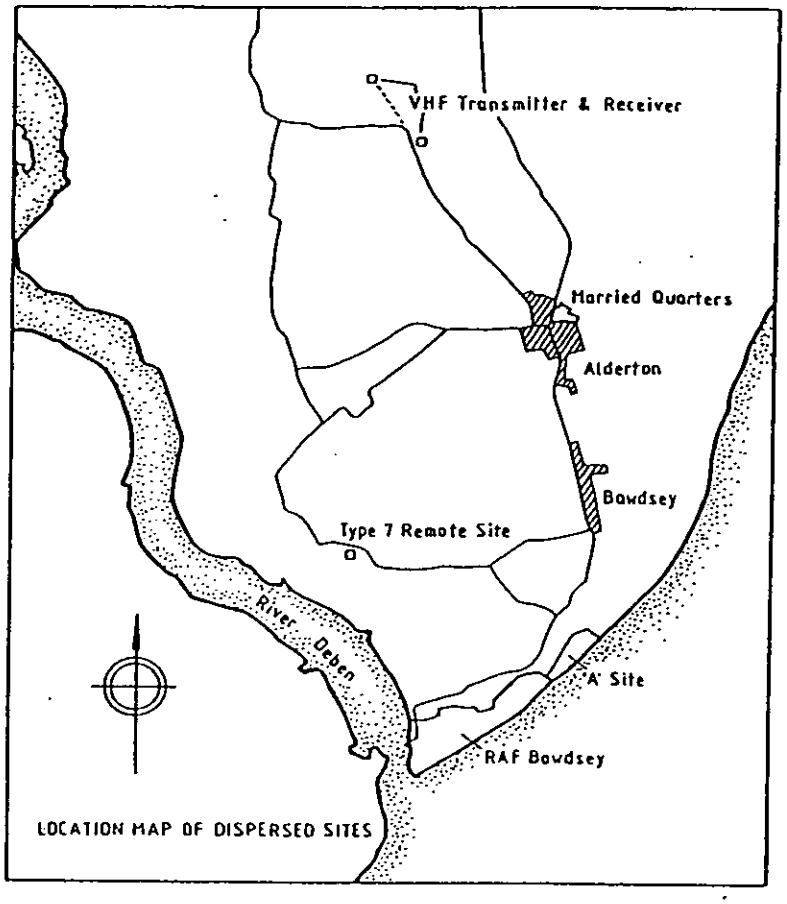
## SUMMARY

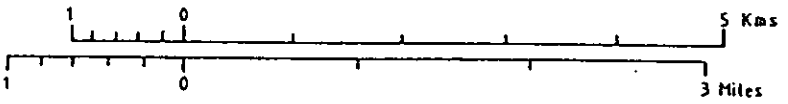
The Air Ministry Research Station at Bawdsey was established in 1936 to develop Radio Direction Finding (RDF) equipment. The site became the first operational RAF Chain Home (CH) RDF station in 1937 and a training school was also established in the same year. A variety of other equipment was added during the Second World War and the site remained operational until 1952. Following the closure, a new radar station with an underground operations room was built to the north of the former main site. The new station became operational 1953/54 and was re-equipped on a number of occasions before being closed in 1975. The radar arrays were dismantled two years later and the majority of radar plinths were demolished to make way for a Bloodhound Mk II missile site, which opened in August 1979. The missile site remained active until July 1990, and the station was officially closed in March 1991.

Structures and features survive from all of the station's phases, these include: the footings of the transmitter hut and an aerial tower base (c1936), a truncated 'Self-Supporting Steel Transmitter Tower, the bases of three transmitter towers, the bases of two receiver towers, a transmitter block, a receiver block, a stand-by set house, a central heating station, a research block, a filter school, nine married quarters, (c1937-39); an Identification Friend or Foe (IFF) cubicle, a gas decontamination block, a 2pdr (40 mm) ammunition store, nine pillboxes, and various ancillary structures (c1939-45); two guardrooms, a R3 underground operations block, a guardhouse, a post office, a sub-station, and a sewage works (c1953-59); a R17 Type 84 modulator building (1962); twelve missile hardstandings, two radar heads, two offices, a dog section, a garage, two ready-use missile stores, an Explosive Fitment Bay, three generator buildings, a store, and two emergency water supplies (c1979-90).

## HISTORY

Bawdsey Manor has its origins in a holiday home built in 1886 by the stockbroker, Sir Cuthbert Quilter. As time went by, he decided to enlarge the house and make it his principal residence. Work commenced in 1895 on the




# RAF BAWDSEY, BAWDSEY, SUFFOLK

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RCHM ENGLAND

Red Tower, followed by the Tudoresque entrance range, and was finished in 1904 with the completion of the Jacoabethan style White Tower. The motto over the entrance reads: Plutot Mourir Que Changer - Rather Die Than Change. Extensive landscaping and planting was carried out in the grounds, and a sunken garden was built around the base of a demolished Martello tower. A walled garden equipped with greenhouses and a 'lemonary' was built to the immediate north east of the sunken garden. The various estate buildings were all built in a Tudoresque style, using brick and mock timber framing. The grounds and stables were requisitioned by the Devonshire Regiment during World War One, and were returned to the Quilter family after the war.

**1935** Selected as a suitable site for the development of Radio Direction Finding (RDF) by Robert Watson Watt, E G Bowen and A F Wilkins.

Purchase recommended by the Tizard Committee and sanctioned by the Air Defence Sub-Committee of Imperial Defence.

December. Treasury provides the necessary funding for the construction of five RDF stations.

**1936** The Manor, out buildings, estate cottages and 67.98 hectares (168 acres) of land sold to the Air Ministry for £24,000.

March. 247 ft timber lattice tower completed.

September. Timber mast used in the 1936 Air Exercises, second tower incomplete. The receiver room was established in the stable block; unfortunately, the transmitter equipment on site failed to work properly and the transmitter array at Orfordness had to be used.

**1937** January. Squadron Leader R G Hart, (Technical Officer) established the RAF's Radio Direction Finding (RDF) Training School.

**1937** Two '240 ft' timber receiver towers completed in time for the
cont'd April 1937 Air Exercises. Both towers were fitted with 22 MHz receiving aerials, one for direction finding and the other for obtaining height. The towers were built by Messrs C F Elwell, costing £2,400 each.

May. The Chain Home (CH) RDF station handed over to the Royal Air Force.

August. A 'filter room' was established to cross plot information

from two other recently opened stations, thus producing tracking information that could be used to vector fighter aircraft etc.

24th September. RAF Bawdsey Chain Home station became the first fully operational RDF (Radar) site in Great Britain, operating as a part of No.60 (Signals) Group.

In addition to the research being carried out at Bawdsey for the Air Ministry, similar work was also being carried out by the War Department (Army) Team. The main concern of the WD (Army) Team was the development of RDF 'Gun-laying' equipment, to permit anti-aircraft guns to fire accurately and in adverse weather conditions. The first practical result of this work, a GL set designed by Mr P E Pollard, was produced in 1937.

Other work carried out by the WD (Army) team included the development of RDF equipment to detect shipping and the fall of shot (which also led to the Chain Home Low (CHL) sets used by the RAF for detecting low flying aircraft), and the production of an equipment that could be used to direct searchlights.

Practical work commenced on the development of an 'Identification, Friend or Foe' (IFF) system, whereby friendly aircraft could be differentiated from hostile aeroplanes on a receiver screen.

**1938** August. RAF Bawdsey took part in the Annual Home Defence Exercises in conjunction with four other Chain Home stations.

**1939** Good Friday. The build up of the Chain Home system had reached the point where fifteen CH stations were available in the reporting role, and the Home Chain went onto a 24-hour watch system.

**1938** June. A visit was made to Bawdsey by Sir Henry Tizard and Mr
cont'd Winston Churchill (then a member of the Air Defence Research Committee). Later in the month the station was visited by Sir Hugh Dowding.

3rd September. On the outbreak of war, the Bawdsey Research Station staff and all of their equipment was packed up and despatched to a number of locations up and down the country.

A perimeter defence scheme was established, manned by a unit of Bedfordshire and Hertfordshire Regiment. It initially consisted of barbed wire entanglements, slit trenches and sandbag defence posts.

**1940** Early monitoring of German Knickebein radio navigational beams undertaken (J Watch reports).

Dr E.G. Barnes returned to Bawdsey to continue the development of Aircraft Interception (AI) RDF equipment, using aircraft from RAF Martlesham Heath.

An AMES Type 2, Chain Home Low (CHL) rotating array was installed on the southern most '200 foot platform' of No.4 transmitter (Tx) tower, with the transmitter block located at the foot of the tower. The CHL equipment was introduced to detect low flying aircraft and coastal shipping, which could not be detected by the CH sets. Although the CHL sets increased the coverage quite dramatically, they also had limitations, in that they were unable to detect small vessels, or very low flying aircraft just above sea-level.

June. Flight Lieutenant Turnbull, concerned over the lack of adequate defences, complained to HQ Fighter Command. An inspection soon followed, with the result that trenches, anti-aircraft pole obstacles and barbed wire entanglements sprouted on the lawns to help repel an airborne attack.

A short time later, a variety of anti-invasion defences manifested themselves all along the Bawdsey Peninsula. These included an ex Naval 6 inch gun installed as an Emergency Battery' at the Point, manned by men of No.332 Battery, 515 Regiment Royal Artillery, scaffolding beach obstacles, minefields, anti-tank cubes, and a number of pillboxes. Near-by on the marshes, a number of trench

**1940** and mound anti-aircraft obstacles were dug, and a number of the drainage cont'd ditches were over-deepened and re-profiled to present further hazards.

3rd July. High explosive bombs dropped on site by an enemy aircraft, fortunately without causing casualties or damage.

18th July. German bombers raid RAF Bawdsey without result.

7th August. Machine-gunned by German aircraft, minor damage and no casualties. Two further attacks were made during August, both to no effect.

18th October. Anti-aircraft gunners at Bawdsey claim as destroyed a German Bomber, which crashed off the mouth of the River Colne.

**1941** 18th April. Ineffective bombing during the early hours.

6th May. The domestic site was bombed, resulting in the deaths of three airmen.

12th May. The anti-aircraft gunners at RAF Martlesham Heath and RAF Bawdsey jointly claimed a German raider. A further claim was made by the Bawdsey gunners for a Heinkel He 111 shot down near the Cork Lightship; however, it was more likely a victim of the guns of the Harwich guardship *Princess Elizabeth*.

The introduction, towards the end of 1941, of 'Centimetric' wavelength (10 cm), Coast Defence (CD) RDF equipment, based on the Naval Type 271 started to enable the defences to get to grips with one of the scourges faced by the North Sea convoys: mine-laying aircraft. The new site established at Bawdsey was given the number 'K 162', and was capable of detecting aircraft and ships to a range of 15 miles at sea level. The range however, was a limiting factor, as 'E-boats' harassing the convoys rarely came sufficiently close inshore to be detected. Nevertheless, the new equipment was a major step in the right direction and considerably enhanced Bawdsey's coverage. The presence of the CD, CHL and CH equipment at one site made RAF Bawdsey unique. Usually CH stations only operated one system and acted as a 'Parent' to other stations operating in the CHL role.

**1942** cont'd 14th January. A parachute mine aimed at the RDF station drifted just outside of the target area before detonating.

12th February. Suffered severe jamming as part of the German efforts to protect the 'Channel Dash' of the *Scharnhorst*, *Gneisenau*, and the *Prinz Eugen*. Although the CH equipment was not able to detect the ships, it was able to plot their approximate position by the screen of fighter aircraft above them.

9th August. Night raid aimed at RAF Bawdsey, using both high-explosive and incendiary bombs, caused damage to a house and a number of farm buildings at East Lane, but failed to affect its intended target.

**1943** 2nd June. 'Tip and Run' FW 190 fighter-bomber aircraft of II/SKG 10 (Schnellkampfgeschwader - fast combat squadron) attacked a number of targets around Ipswich and Felixstowe. RAF Bawdsey was hit and a corporal was killed.

August. An AMES Type 55, CHEL radar set replaced the earlier

CD equipment. Its rotating paraboloid dish array was installed on the northernmost '200 foot platform' of No.1 transmitter (Tx) tower. This new high-powered system enabled the detection of 'E-boats' out to a range of 30 miles. Tracking had also been made considerably easier and more reliable by the introduction of the Plan Position Indicator (PPI) display, which depicted a plot on a screen with geographical information superimposed. As with the CHL set, the operational equipment was installed in a hut at the base of the tower.

4/5th August. The German 2nd and 6th Flotillas laid a minefield off Harwich and one of the 'E-boats' sank the patrol trawler *Red Gauntlet*. Unfortunately, the whole incident was missed by K 162 as the CD radar was being replaced by the new CHEL set. However, the new equipment was operational by the night of the 24/25th September, when it detected the largest ever 'E-boat' raid (Operation Probestick).

17th December. A Handley-Page Halifax aircraft belonging to No.138 Squadron collided with the top of one of the receiver (Rx) towers and crash-landed a short distance away in the Deben Estuary.

**1944** 23rd June. Last bombing raid near RAF Bawdsey.

September. The monitoring commences of the launch of V2 rockets, known as 'Big Ben' incidents, using CH receivers codenamed 'Oswald'. An 'Oswald' receiver was a Cathode Ray Direction Finding (CRDF) system, it consisted of a 1.37 x 0.60 x 0.76m (4ft 6in x 2ft x 2ft 6in) cabinet with 22cm (9in) square cathode ray tube (CRT) screen, with a horizontal trace that moved from the top to the bottom. A camera within the cabinet recorded the trace as a long exposure photograph, and if a 'Big Ben' was observed, the film was removed and processed to assess the plot.

The 'Oswald' receivers had been initially installed in late 1943 at CH stations facing south across the English Channel, but were quickly moved to six east-facing sites, once it was realised that the new weapon would come from that direction. RAF Stoke Holy Cross, High Street, Bawdsey, Great Bromley, Dunkirk, and Swingate were all equipped with 'Oswald'; however, Bawdsey was also equipped with 'Willie', which was capable of recording the plot as a moving image on cine film.

Although nothing could be done to prevent the arrival of a V2 once it had been launched, it was hoped that by plotting the launch

sites with CH, it would provide Bomber Command with target information to attack it, and that a four minute warning could be given to London. Ultimately, neither came to pass; the rockets were operated from mobile launchers on a 'shoot and scoot' basis, and the dislocation of everyone in London rushing to take shelter as a result of one missile was deemed too
damaging to moral and the war effort.

21st September. A V1 flying bomb crashed onto Bawdsey beach.

9th October. A V2 rocket detonated over the sea, off Bawdsey.

**1945** No.5 Radio School established to train radar mechanics and operators.

The run-down of the radar stations and the control and reporting (C&R) system, which had started in 1944, was rapidly accelerated; from a peak of 194 radar stations in 1944, a post-war total of 36 was achieved by 1947. Of these 36 sites, only 29 were manned at full readiness and these only covered a 'Defended Area' from Portland Bill to Flamborough Head (later to be known as the Main Defended Area or MDA).

**1948** Listed as an operational CH/CHEL station.

**1949** ROTOR scheme recommending a sweeping expansion and re-equipping of the control and reporting system was issued.

**1950** The Fighter Plotters School was enlarged by the establishment of the Radar Supervisor's School. Scheme instituted to call-up Class Z reservists for 15 days' annual training, in order that they could man a rapidly expanded control and reporting system should the need arise.

Air Council approval given for the up dating of the wartime radar system; the ROTOR Plan Stage 1.

August. Approval given to the initiating of the provision of up-dated equipment and the construction of thirteen underground 'Early Warning' (EW) stations, together with two underground Sector Operations Centres (SOC), within the Main Defended Area. Radar coverage was also to be extended up the East Coast as far as Aberdeen, and along the south and west coasts. RAF Bawdsey was one of the sites to be provided with underground accommodation and it was intended to install all equipment between the 10th December 1951 and 14 January 1952.

The construction contract was let to Peter Lind & Co. and work commenced on the building of a large R3 operations block. The R3 was let into the gentle slope of the hill, some 700-m (765 yds) north-east of the CH transmitter, near Middle Barn Farm.

**1952** Work commenced on the demolition of a number of temporary wartime structures, and the construction of a new administrative and domestic site to the north-west of Bawdsey Manor.

**1953** February. The low-laying parts of site were inundated by the sea including the remote R7.

AN/FPS-3 radar set to be completed by the end of February, and was to be operated from an Air Ministry timber sectional hut (Type A), until the full installation of the radar office within the R3 was completed.

February 28. The ROTOR site begins to function as a Ground Control Interception (GCI) Type E radar station, with the identification code letters 'PKD'.

March. Estimated date for the completion of the VHF radio installations.

Towards the end of the year, the Chain Home equipment was taken out of service and placed in a state of 'Care and Maintenance', and the Chain Home Low array was removed from the southern transmitter (Tx)tower.

**1954** The R3 underground operation block became fully operational as a part of the ROTOR scheme, operating as a Group Control Centre.

July. Links established between the French and British control and reporting (C&R) systems, allowing an extension of radar cover over Europe.

**1955** October. The manning of RAF Bawdsey and six other radar stations in the Eastern Sector was on the basis of half an hour before dawn through to half an hour after sundown, with no coverage at all during the hours of darkness.

**1956** April. ROTOR Plan Stage 1 fully completed, consisting of 39 radar stations, which provided control and reporting information for the whole of the east and south-east of Great Britain, and limited cover over the remainder of the Kingdom. RAF Bawdsey was manned by No.144 Signals Unit, No.11 Group.

**1958** The installation of an AMES Type 80 Mk3 (Green Garlic) radar greatly enhanced the range and accuracy of cover, and provided both Ground Control Interception and Early Warning information.

**1959** 20th July. A commemorative plaque was unveiled in the Officers' Mess by the Duchess of Gloucester, it read: "In the year 1936 at Bawdsey Manor, Robert Watson Watt and his team of scientists developed the first air defence radar warning station. The results achieved by these pioneers played a vital part in the successful outcome of the Battle of Britain in 1940."

December. The Queen approved a station badge for RAF Bawdsey, based upon the watchdog mosaic in the main entrance porch of the Manor, which in turn, was based upon a mosaic at Pompeii. The motto 'First in the Field', emphasised the stations claim to be the first operational radar station in the United Kingdom.

**1960** Chain Home transmitter towers nos. 3 and 4 are retained for the installation of microwave radar-link equipment, and a pair of associated reflector mountings were built adjacent to the estate road, offset from the towers at an angle of 340° from true north, matching the array's line of shoot.

**1962** 2nd October. The first AMES Type 84 L-Band radar was handed over to the RAF at Bawdsey.

**1963** January. Bloodhound surface-to-air guided weapons (SAGW) were regrouped under the control of Master Radar Stations at RAF Patrington and RAF Bawdsey.

No.'s 1 and 2 Tx Towers extant, all Rx towers demolished.

**1964** June. RAF Bawdsey lost its Master Radar Station status and becomes a 'Satellite Station' to RAF Neatishead.

**1966** February. RAF Bawdsey regained its role as a Master Radar Station following the outbreak of a serious fire within the underground R3 operations block at RAF Neatishead.

**1970** The Type 84 radar was removed and transferred to RAF Bishops Court, in Northern Ireland.

**1971** RAF Bawdsey retained its Master Radar Station status, using radar arrays both on site, and at RAF Neatishead.

**1974** RAF Neatishead re-assumed the Master Radar Station role from Bawdsey on the completion of the installation of the Standby Local Early Warning and Control System (SLEWC).

**1975** 1st April. The School of Fighter Control closed and moved to RAF West Drayton.

March. RAF Bawdsey closed and the station was placed in a state of 'Care and Maintenance'.

**1977** The ROTOR period radar plinths, the Type 80 modulator building, and the '200 foot Type 54 Tower' were demolished.

**1979** August. RAF Bawdsey re-opened as a Bloodhound Mk II surface-to-air missile (SAM) site. Operated by 'C' Flight No.85 Squadron, divided into two missile sections, each equipped with six launchers and a Type 87 fire control radar.

**1984 -85** Strike Command (UKAIR) Interim Alternate War HQ (IAWHQ) established within the R3 operations block.

**1988** The two Type 87 radar heads were removed and replaced by Type 86 radar caravans, each mounted on a platform on top of one of the 4.26 m (14 ft) high Type 87 radar plinths.

**1990** 31st May. Bloodhound Force ceased to be operational.

June. All of the missiles were withdrawn to RAF West Raynham.

**1991** 25th March. RAF ensign lowered for the last time.

31st March RAF Bawdsey was officially closed.

## DESCRIPTION

RAF Bawdsey is situated on a low ridge of Pleistocene sands and clays, the highest point of which is some 21-m (68 ft) above Ordnance Datum. The ridge forms a promontory aligned northeast to southwest, with a cliff to the seaward (southeast) side. The ridge drops in height to the south west of Bawdsey Manor and terminates where it meets the River Deben at Bawdsey Ferry. The landward (northwest) side of the ridge dips gently down to Ferry Road and the Bawdsey Marshes.

The site is located approximately 3-km (1¾m) northeast of the centre of Felixstowe, and 2-km (1¼m) southwest of Bawdsey village. As originally built, the site occupied some 47.126 ha (116.45 acres) of the 67.988 ha (168 acres) of land owned by the Air Ministry. During 1951, the land occupied was extended to the northeast by a further 8.520 ha (21.05 acres), to allow for the construction of the ROTOR site.

Bawdsey Manor currently (1998) operates as an international residential language school. Although many of the RAF structures have been demolished over the years, representative examples survive from all of the major phases of the site.

### Air Ministry Research Station

Apart from the pre-existing Manor House and the associated estate buildings, the only features that are known to survive from the original phase are located at the north-east corner of the site, approximately 150m (164yds) south-east of the North Lodge. These include three hut bases, the concrete foundation blocks of a 75.28m (247ft) timber tower (No.3 Tower / Mast No.9), and the combined transmitter laboratory and stand-by building.

The three hut bases are grouped around the tower foundation blocks, and were originally contained within a square plan fenced enclosure, visible on aerial photographs taken in July 1940. The base of hut No.68, located to the southwest of the foundation blocks, is barely discernible and shows only as a slight change in ground level. The footings of the Transmitter Hut (hut No.3) are located to the north-east of the tower foundations, and consist of five low concrete wall joists contained within a rectangular plinth of cement rendered brick.

The base of the Rotary Hut (hut No.73 / No.90) is more substantial, consisting of a raised rectangular concrete floor, with recessed ducting and the impressions of four cabinets. Rag-bolts set in the concrete around the sides of the hut base indicate that the structure was timber framed. The north-western end of the base extends out between two of the concrete foundation blocks of the former tower.
The impressions in the concrete of the cabinets are located towards the four

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50 0 300 M
200 0 1000 Ft

Marsh Cottages
Kennelman's Cottage
Manor Dairy
Laundry Cottages
Honeymoon Cottage
Bawdsey Manor
Landing Ground
'A' Site
pond
Mean High Water
Mean Low Water
RIVER DEBEN

Original building numbers in brackets

1 (1) Guard House & Armoury
2. (36A) Boathouse / Yacht Club
3. (7) Post Office
4. (79) Senior NCO's Mess (former Filter School)
5. (26) Bawdsey Manor, Offkers Mess
6. (19) Gas Decontamination Centre
7. (4) Inflammable Store (POL)
8. (72) Fire Tender Crew Rooms (former Motor Transport Office)
9. (6) Motor Transport Office
10. (89) Motor Transport Shed & Workshop
11. (9) Central Heating Station
12. (80) Airmens Barrack Block (former Research Block)
13. (222) Transformer Kiosk
14. (226) Oil & Paint Store
15. (222A) Transformer Kiosk
16. (11) Picket Post

a IFF MkIII Cubicle
b Base of 240ft Receiver (Rx) Tower
c Receiver Block
d Base of 120ft 'Buried Reserve' Receiver (Rx) Tower
e Truncated Steel Transmitter (Tx) Tower
f Base of 357ft Transmitter (Tx) Tower
g Transmitter Block
h Base of 247ft Transmitter Tower } Air Ministry Research Station
i Transmitter Hut 90 }
j Base of 120ft 'Buried Reserve' Transmitter (Tx) Tower
k Entrance to 'Buried Reserve' Transmitter Block
l Stand-by Set House & Oil Store (former combined transmitter laboratory & stand-by set house)
m Water Tower
n Footings of Responder Beacon

Surviving buildings
Demolished buildings
pb Pillbox
gp Gun post
aa 2pdr AA ammunition store

corners of the structure. Two parallel, deeply recessed ducts run three-quarters of the length of the base, linking the former positions of the paired cabinets. A transverse duct passing under the easternmost position links the two parallel ducts to yet another duct that turns 90° and passes out through the south-west side wall into a narrow, rectangular, concrete pit. The ducts probably contained both the electrical cabling and the distilled water pipes for cooling the valves, and it is likely that the concrete pit would have contained distilled water tanks.

The combined transmitter laboratory and stand-by set house stands approximately 80m (87yds) north of the footings of the rotary hut. Originally it was an 'L' plan structure, with a long southwest range attached to the stand-by-set house. The southwest range has been demolished and its footings used as a base for a catch-pit built around four fuel oil tanks. In its present form the stand-by-set house is a tall single storey, cement rendered structure with a corrugated asbestos gable roof.

An annexe with a cat-slide asbestos roof is built against the northwest gable, and a header tank chamber has been built against the southwest wall. A pair of tall, ten light steel casement windows are situated in both the southeast gable and the northeast elevation. A pair of timber doors close a double doorway in the south-east gable. The northwest gable and the southwest are blind apart from a small window in the northwest annexe. Access was not possible to the interior at the time of the field visit. **NB** this building was retained as part of the Bloodhound Missile Site, and the perimeter fence was extended to enclose it.

**Chain Home Station**

Chain Home RDF (radar) stations did not sweep a rotating radar beam but irradiated lobes of energy along a particular bearing or 'line of shoot'. Due to the shape of the main lobe it was not possible to provide total coverage and it was necessary to operate a number of secondary lobes of energy to 'Gap-fill' behind and to the sides. The main lobes of the adjoining CH stations at RAF High Street, RAF Great Bromley and RAF Canewdon partially intersected that of Bawdsey to produce continuous cover.

The 'Final' Chain Home station provided long-range, early warning of enemy aircraft with an average range of between 160.93 - 321.86-km (100 - 200 miles) on aircraft flying at 4572-m (15000 ft). The accuracy of the CH plot was subject to a number of factors and obtaining an accurate bearing at long-range was difficult due to the weak echo strength. As the echo strengthened more accurate bearings were obtained but were still insufficient to provide a smooth track. To overcome this problem, the plots were sent to the 'Filter Room' at Fighter Command Headquarters, RAF Stanmore, where plots from adjacent CH stations could be compared to provide a smooth track of the course of the enemy aircraft.

One of the problems encountered with all RDF sets was finding a means of

differentiating between friendly and hostile aircraft. During the early part of the war Interrogation Friend or Foe (IFF) equipment was developed and the IFF Mk II set found widespread use. The IFF Mk II transponder was capable of receiving the primary pulses from CH, MRU, or GL sets, and retransmit them relatively undistorted, rotating the variable condensers of the oscillatory circuits. The effect was to produce a pattern on the CH operator's cathode ray tube which increased in amplitude for brief periods, at intervals of around ten seconds, indicating the presence of a friendly aircraft.

Unfortunately, as the war progressed, the number of radar types, users and wavelengths increased with the result that the IFF Mk II equipment then fitted in British aircraft, could not be relied upon. To overcome this problem, the IFF Mk III equipment (transmitter T.3117 and receiver R.3118) was developed which had a frequency sweep of 157 - 187 Mc/sec. The equipment was installed at Bawdsey in a small cubicle at the base of the receiver tower immediately adjacent to the stable block of the Manor. The aerial, which consisted of three vertical full wave dipoles with an untuned reflector screen, was installed on the tower.

A number of structures and features, including the IFF cubicle and the four concrete foundation blocks of the associated Rx tower survive from the Chain Home phase of the station. The most notable survivals include: a truncated self-supporting steel transmitter tower, a transmitter block, a receiver block, the foundation blocks of two receiver towers, a 'Buried Reserve', which consists of two brick-built, under-ground chambers (one for a MB Type (T.3018) transmitter and the other a R.3046 receiver), the bases of their associated 36.57m (120ft) towers, a water tower, and various defence works. The receiver block of the 'Buried Reserve' was not examined during fieldwork.

'Self-supporting Steel Transmitter Tower',
Air Ministry Works Directorate drawing 2703/38.

Originally one of four transmitter (Tx) towers, this structure is the most conspicuous feature at RAF Bawdsey. The tower is constructed of bolted galvanized steel girders and it rises to a height of 85.34-m (280-ft) above ground level. A series of timber ladders and landings within the structure provide access to the various levels of the tower. As originally built, the tower stood to a height of 109.16 m (358ft 2in), and it was equipped with six timber-floored cantilevered steel platforms. The platforms extended from the sides of the tower at 15.23 m (50 ft), 60.95 m (200 ft), and 106.67 m (350 ft), and were built to permit access to, and the suspension of, aerial arrays between the towers.

The upper or main array consisted of a vertical stack of eight horizontal half-wave antennae. Auxiliary antennae were placed at heights calculated to fill

gaps in the radiation lobe of the main array. Each array included a rear reflector curtain of half-wave antennae; the lengths and spacing of which were calculated to produce the minimum of backward radiation, thus preventing unacceptable permanent echoes from nearby buildings, and confusing returns from aircraft flying to the rear of the RDF station.

One issue that has caused some confusion is the height of the Chain Home Tx towers. Some official documents describe them as '360ft', while others list them as '350ft' towers. However, neither of these often-repeated heights is correct, as they are only convenient approximations. Air Ministry M + E drawing No. 6888/38 gives the precise height as 358ft 2in (109.16m).

Further confusion exists with regard to the numbering of the towers at RAF Bawdsey. Initially, the Tx towers were numbered 4 - 1 from the northeast, making the extant tower No.3; however, circa 1960 this numbering sequence was reversed, with the result that the extant tower became No.2.

The extant Tx tower is currently used for communication equipment operated by the Harwich Port Authority, and as a relay point for cellular telephones.
The foundations of the three demolished TX towers, and the concrete base of the Nissen hut that served the Type 55 CHEL array on No.4 tower and some of the concrete bases of the aerial curtain balance weights remain extant.

'A' Type Protected' Transmitter Block,
Air Ministry Works Directorate drawing 4234/38.

The transmitter block is a single-storey, 23.67 x 8.30-m (77¾ x 27 ft) rectangular plan structure. The building was originally entered via an air lock in the southern wall, consisting of two wooden doors with rubber gas-seals at either end of a porchway. The original emergency exit located in the northern wall of the transmitting room is currently used as the access to the interior. A pair of ventilated steel doors located in the eastern wall permit access to the former transformer cubicle. The majority of the original timber casement window frames remain in place.

Internally the structure was divided into a lobby, a ventilation plant room, a private branch exchange (PBX), a latrine, a transformer cubicle, a sub-station/ workshop and the transmitter room. The majority of the equipment has been removed but the transmitter switchgear cabinet remains in the sub-station room above the low voltage cable trench.
Originally, the power supply for the Chain Home station would have been brought into the transmitter block at a high voltage of 11 kV from the National Grid, where it would have been transformed down to 230/400 volts for distribution to the remaining buildings. The transmitter block was equipped with a duplicate pair of CH type (T.3026) transmitters, associated test-gear and switchgear with cables and pipes carried in under-floor ducts or on cable trays

hung from the ceiling. A T.3026 transmitter typically weighed about 6096-kg (6-tons) and consisted of a drive stage cubicle, an output stage cubicle, an annexe cubicle and a control desk.

The transmitter was designed to work on any one of the four wavelengths and employed continuously evacuated water-cooled valves - the only type available in 1937 that were capable of producing sufficient power. The distilled water for cooling the valves was stored in a 1878-litre (400-gallon) tank beneath the transmitter room, accessed via a hatch in the floor. The warm air was vented by two cooling fan outlet ducts, which pass through the external earth revetments.

T.3026 Transmitter

| | |
|---|---|
| Pulse power | 300 - 450 kW |
| Pulse duration | 5 - 4 microseconds |
| Repetition frequency | 50, 25 or 12.5 pulses per second |
| HT | 25 kV corresponds to about 200 kW output |
| Frequency range | 20 - 60 megacycles |

As time went on, new units that were equipped with air-cooled valves and thyratrons replaced the transmitters.

'A' Type, 'Protected' Receiver Block, Air Ministry Works Directorate drawing 4238/38.

The receiver (Rx) block is a single storey, 18.28 x 9.0m (60 x 29ft) rectangular plan structure. The building is entered via an air lock set centrally in the northern wall, consisting of a pair of timber doors lined with rubber gas-seal. A pair of ventilated steel doors located at the western end of the northern wall permit access to the former transformer cubicle. An emergency exit is located in the east wall of the calculator room. All window openings retain their timber-framed casements, and a number of the galvanized steel ventilator ducts remain in situ.

Unfortunately, it was not possible to make an inspection of the interior of the receiver block during the site visit. In its original condition the interior of the Rx block would have been entered via a lobby from the gas-lock and it would have been sub-divided into an office, a plant room, a switchgear room/sub-station, a storeroom, a latrine, a receiver room and a calculator room. A 1.04m (3ft 3in) wide cable duct, which carried the cables from the receiving towers, runs under the full length of the building.

The receiver block would originally have been equipped with: - a receiver aerial switching and phasing unit rack, two Cossor RF8 (R3103) receivers and Mk II or Mk III consoles with associated test gear, and a variety of auxiliary equipment, including an electrical calculator, telephone terminals and

synchronising equipment. The calculator was similar to an analogue telephone exchange, automatically converting range, bearing and angle of elevation obtained by the receiver into a grid reference point and height in thousands of feet.

Both the transmitter and the receiver blocks conform to a common 'Protected' type of construction. The two buildings are single-storey, constructed in Flemish bond, fair-faced brick, with flat reinforced concrete roofs, behind 1.75m (5ft 9in) high brick parapets. The parapet walls are built of a porous brick, and are pierced by 22-cm (8¾-in) square drain holes, which empty into cast-iron storm-boxes. The storm-boxes are set flush with the upper surface of the reinforced concrete roof at a height of 3.26-m (10ft 6in) above ground level.

Blast reduction was achieved by a laminar roof construction, consisting of a 12.6-cm (5-in) reinforced concrete slab resting on a 61-cm (2-ft) layer of shingle, laid on a 76-cm (2ft 6in) layer of sand and shingle, which in turn was laid directly onto the asphalt water-proofing of the 30.5-cm (1ft) thick reinforced concrete roof. The elevations of each structure were protected by blast deflecting earth revetments (traverses), retained by battered reinforced concrete walls rising to a height of 2.9-m (9ft 5in), spaced between 1.38-m (4ft 6in) and 1.84-m (6ft) from the building. This space was designed further to reduce the effects of blast on the fabric of the building and to permit free movement of personnel around the building during an enemy attack.

The reinforced concrete foundation blocks of two of the receiver towers associated with the Rx block remain in situ. The location of one of the other Rx towers was discernible as crop marks during the survey.

'Buried Reserve' Transmitter Building
AMWD drawing 15401/39

The 'Buried Reserve' transmitter building is located at what was the north-eastern edge of the Chain Home site, immediately adjacent to the footings of the former Air Ministry Research Station transmitter hut (Hut 90). The 'Buried Reserve' is an underground, single-storey, 14.28 X 7.24-m (46ft 9in X 23ft 9in) rectangular plan structure, built of brick. The roof is of a 'protected' design similar to that used on the transmitter and receiver blocks, with an additional covering of 30.5-cm (1-ft) of earth. Ventilation was provided by three cement-rendered brick ventilators with wooden slats, two located to the south-west near the footings of Hut No.3, and one some 9.14m (30ft) to the north.

The entrance consists of two sets of flat reinforced concrete covers carried on steel rollers and running rails, raised on a low cement rendered brick plinth. Two 1.55-m X 1.55-m X 10-cm (5ft 1in X 5ft 1in X 4in) covers close the

goods opening, while a single 1.70m X 99.7cm X 10cm (5ft 7in X 3ft 1in X 4in) cover closes the stair opening. The running rails for the covers are set at 1.60-m (5ft 3in) and 99.7 cm (3ft 3¼in) centres, respectively. Each cover has four rollers and steel handles at each end for pulling open and closed.

Access is gained by rolling back the cover over the stair opening. A 60.8-cm (2ft) wide steel stair with plain steel balustrades descends at 60 to a landing set against the south-east wall, where it returns and descends to the floor of the 'Buried Reserve', which is 5.30-m (17ft 5in) below ground level. (NB most of the steel rungs of the upper flight have been removed to discourage entry.)

The walls of the stair well are of flush pointed brickwork laid in English bond. The outer walls are 45.7-cm (1ft 6in) thick, with a vertical asphalt damp-proof coat encased by a further skin of brick laid in stretcher bond. The interior face of the walls of the air conditioning room are painted straight onto the brick, while the remaining rooms have all been skimmed and painted.

The rooms are accessed from the stair well by two doorways; the double doorway in the north-western wall leads into the transmitter (operations) room, while a doorway in the south-western wall allows access to the air conditioning plant room.

The air conditioning plant room is entered through a gas-tight steel door, which opens inwards. A gas filter cabinet is mounted on a concrete bed directly in front of the doorway. An opening above it in the southwest wall is the air intake. Marks on the wall and fittings on the filter cabinet indicate that air was drawn in through galvanized steel ducting. A concrete bed against the northwest wall would have been occupied by a suction fan, which would have drawn air through the filter and blown it under positive pressure into the transmitter room and into the transmitter cabinet via ducts suspended from the ceiling.

Originally the transmitter room was entered via an air-lock but this feature no longer exists; however, evidence in the form of hinges and rubber gas-seals indicate that the outer gas-tight doors were of steel, while the inner doors were of timber. Beyond the former position of the air lock a doorway to the right permits access to a lavatory. The air lock is flanked to the left by a brick wall. Behind this wall, an extension of the transmitter room extends back to the wall of the air conditioning plant room. Cut off steel stanchions and cables in the floor against this wall, and paint shadows on the south-western wall, indicate that this area was probably occupied by a steel-frame supporting a number of fuse boxes and switches. On drawing 15401/39 this area is identified as a rest room, but there is no physical evidence to suggest that this area was ever partitioned off from the rest of the transmitter room.

The remainder of the transmitter room occupies an area of approximately 6.09m (20ft) square. The floor of the transmitter room is of concrete, finished

with a layer of grano. A 10cm (4in) coved grano skirting protects the base of the walls. A 1.37-m (4ft 6in) cement dado projects slightly beyond the line of the walls. The reinforced concrete roof is carried on two 45.70cm (1ft 6in) RC beams. It is skimmed in plaster and painted white. Portions of plaster have fallen away to reveal the concrete surface below. A painted galvanized 'fish-frier type extraction hood is suspended from the ceiling at the north-western end of the room which would have drawn off hot air from the MB Type (T3018) transmitter. Fixing points in the ceiling to the southeast of the hood indicate the location of fresh air ducting which served the transmitter.

A 1.37m (4ft 6in) square steel gas-proof door is set centrally in the north-western wall, just below the ceiling. A steel cat ladder set into the wall to its right accesses the door. The door opens back into the room and allows access to a 3.88-m (12ft 9in) passageway now blocked with rubble, which lead to the emergency exit shaft already mentioned.

The concrete foundation blocks of the 36.57-m (120-ft) high timber 'Reserve Tx' tower remain extant, some 18.28-m (60-ft) south-west of the entrance. The foundation blocks are so arranged that the tower faces would have been aligned on the cardinal points, indicating that the 'line of shoot' was towards the east.

The 'Buried Reserve' receiver block is located in dense scrub to the east of the former laundry. It was not inspected during the field visit, but it is very similar to the 'Buried Reserve' transmitter building described above. The receiver block would also have been equipped with a 36.57-m (120-ft) timber tower, the foundations of which are also known to be extant.

As built, the receiver block was equipped with a R.3046 receiver. The 'Buried Reserve' buildings would only have been brought into action had both of the transmitters, or both of the receivers failed. Unlike the main CH receivers that were equipped with electronic plot conversion equipment, the 'Buried Reserve' receiver was not so efficient, as grid plots had to be worked out manually.

Second World War Defence Works

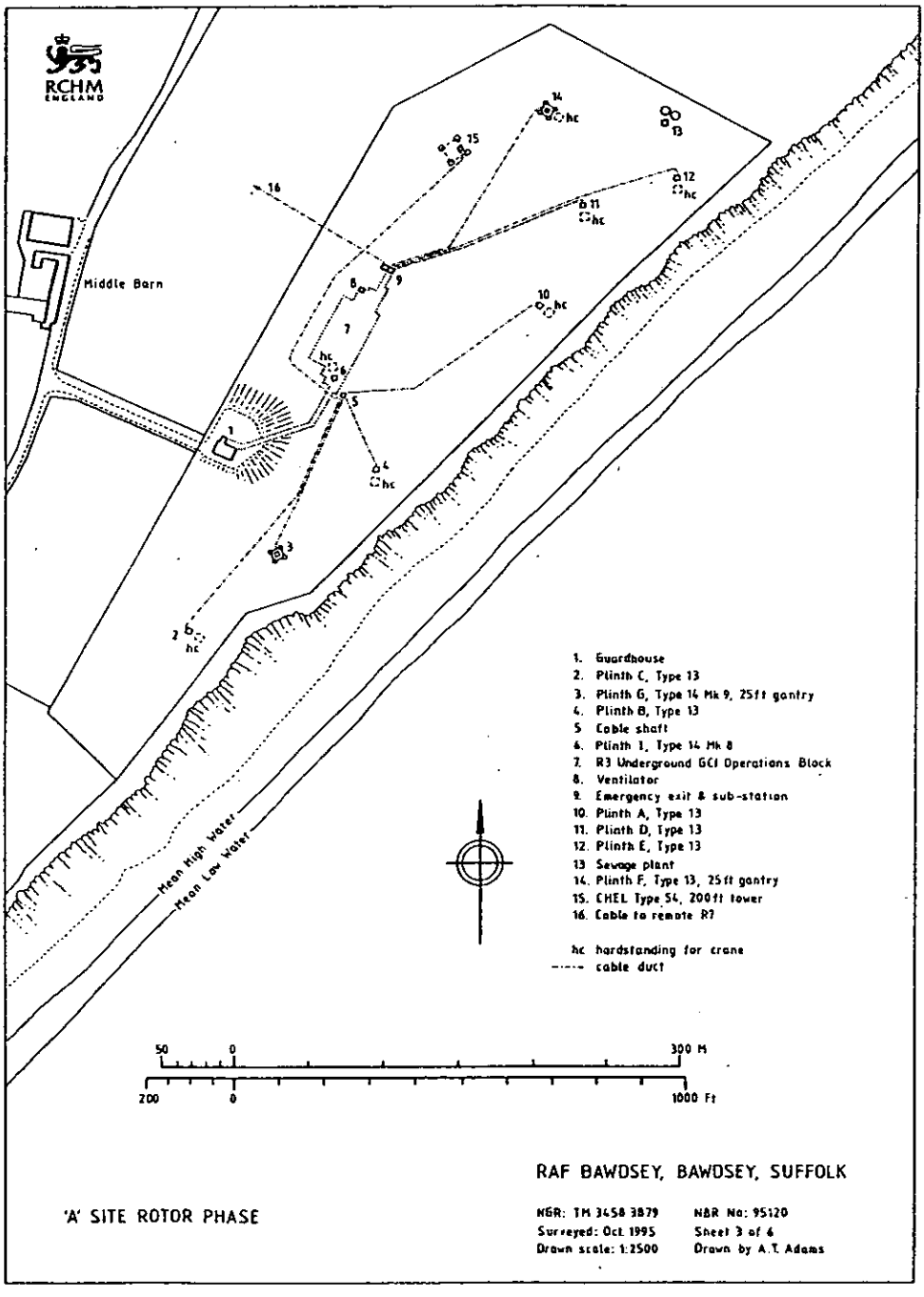
Although the full significance of the Chain Home system was not appreciated by the Germans, they were aware that the stations were being used as some form of early warning, and as such, placed them on their target lists for air attack. The British, fully understanding the CH system's significance, placed a very high priority on their anti-aircraft defences, issuing the new rapid firing 40mm Bofors Light Anti-aircraft (LAA) guns, known in RAF parlance as the '2-pdr' anti-aircraft gun.

RAF Bawdsey was identified as a potential target for aerial bombing, becoming 'Vulnerable Point' (VP) 124. As early as September 1939, it was protected by three of the scarce Bofors guns. In May 1942, the 6th Anti-aircraft Division's location statement indicated that RAF Bawdsey was protected by three 40mm Mk II Bofors guns mounted on concrete holdfasts - one located at Bawdsey Point, one on Bawdsey Marsh near the flood bank, and

one to the north-east of the site, on the highest point of Bawdsey Cliff. In addition, twin and single 0.303 Lewis anti-aircraft light machine guns (AALMG) supplemented the Bofors guns. Sometime later, a 20mm Oerlikon light anti-aircraft (LAA) gun, emplaced on a cone mounting, was also added to the inventory.

Unlike the anti-aircraft defences, the ground defences of RAF Bawdsey were very rudimentary to begin with, consisting of little more than trenches and barbed-wire entanglements, but as time went on they became progressively more elaborate. Fears of a German invasion or raids ensured that by the latter half of 1940 the perimeter was protected by slit-trenches, a number of sandbag weapon pits, a concrete gun post and at least ten Type FW3/24 pillboxes. Some of these pillboxes were strengthened at a later date by the addition of a 91.14-cm (3-ft) skirt of concrete filled sandbags, raised to just below the level of the embrasure cills. Initially the Army would have manned these defences, but after 1942, its role was relinquished to units of the recently formed RAF Regiment.

At the time of the survey nine of the Type FW3/24 pillboxes and a 2-pdr anti-aircraft ammunition storehouse remained extant. A number of concrete anti-tank cubes also remain between the foreshore and the sports ground, and at the exit point off Bawdsey Beach near Manor Dairy; however, these defensive structures formed part of the 'Coastal Crust' anti-invasion defences, and were not strictly part of those protecting RAF Bawdsey.




RAF BAWDSEY, BAWDSEY, SUFFOLK

'A' SITE ROTOR PHASE

NGR: TM 3458 3879 NBR No: 95120
Surveyed: Oct 1995 Sheet 3 of 6
Drawn scale: 1:2500 Drawn by A.T. Adams

**Rotor / Plan Ahead / Linesman**

The ROTOR period Ground Controlled Interception (GCI) 'A' site was located to the north-east of the wartime Chain Home site, near to Middle Barn Farm. It occupied 8.520-ha (21.05 acres) of land enclosed by a 5-cm (2-in) chain-link fence, topped with three strands of barbed wire, supported on 1.72-m (5ft 8in) high cranked concrete posts set at 3.35-m (11-ft) centres.

As originally planned, RAF Bawdsey was a GCI/E site and was equipped with:

| | | |
|---|---|---|
| 1 | Type 7 Mk3 | mounted on a R7 building. |
| 1 | Type 79 Mk1 IFF | associated with the above. |
| 3 | Type 13 | mounted on '9ft' plinths. |
| 2 | Type 13 | mounted on '12ft' plinths. |
| 1 | Type 13 | mounted on a '25ft' gantry. |
| | (four Mk6 with A-band IFF and two Mk7 without IFF) | |
| 1 | Type 14 Mk8 with G-band IFF | mounted on a '9ft' plinth. |
| 1 | Type 14 Mk9 with G-band IFF | mounted on a '25ft' gantry. |
| 1 | Type 54 Mk3 without IFF | mounted on a '200ft' tower. |

Once in operation, it became clear that the ROTOR 'Stage 1' radar equipment did not provide sufficient early warning, particularly against fast jet aircraft. As a result the British decided to augment their equipment by the addition of a number of American AN/FPS-3 C/D band Centimetric Early Warning (CEW) radar. One of these high-power medium/long range radars was installed on a 7.62-m (25-ft) steel gantry at Bawdsey. Initially the display equipment was housed in an Air Ministry sectional timber hut alongside the gantry and was connected to the R3 underground operations block by voice telling. Eventually, the displays were moved into the R3, and the radar was equipped with the Mk10 IFF system.

The installation of the ROTOR 'Stage 2' Type 80 Mk3 E/F band long-range early warning radar was completed during 1958, together with two AN/FPS-6 height-finders. In the interim period the AN/FPS-3 was retained as a stand-by. The Type 7 array was also retained at the remote site to provide short-range working. The AN/FPS-6 arrays were installed on steel gantries situated to the north-east of the R3. The new height-finding arrays ('nodding horrors') were necessary, as the old Type 13 height-finding radars were unable to match the greatly increased range of the Type 80. The AN/FPS-3 was only retained for a short time once the Type 80 was fully operational, and on its removal, was replaced by a further AN/FPS-6 array. The final addition to the range of equipment used at RAF Bawdsey came in 1962, with the installation of the Type 84 high-power, control and surveillance D band radar as a part of the PLAN AHEAD/LINESMAN schemes.

Access to the 'A' site was provided by a new military road, which branched off Ferry Road near to Middle Barn Farm. The road entered the complex via a

gateway in the perimeter fence, adjacent to the guardroom bungalow. RAF Police operating from the guardroom, which also doubled as the entrance building to the R3 underground operations block, controlled access. A 12.19 X 6.14-m (40ft X 20ft 2in) wire mesh police dog compound was built a little to the south-west of the gate.

Today, the only structures from the radar phase that survive on 'A' site are: the guardroom, the R3 operations block and associated sub-station, the police dog compound, the Type 84 modulator building, a sewage farm, and two concrete holdfasts, possibly associated with microwave radar links. In addition to the buildings on 'A' site, structures also survive on three remote sites, these include: a R7 building on the Alderton Marshes, a transmitter (Tx) and the receiver (Rx) blocks of the VHF radio station near Shottisham, and the married quarters estate in Alderton village.

Guardhouse

The guardhouse is a single storey, four-bay, 15.18 X 8.32-m (49ft 10in X 27ft 4in) plan bungalow, with a tiled gable roof which projects on stepped concrete kneelers. It is built of a fair-faced dark orange brick using cavity-wall construction. The entrance is located in the western bay of the front elevation, and is lit by a pair of vertical three light uPVC windows, which flank a (2ft 10in) wide steel door, with a centrally set peephole. The remaining three bays are lit by double glazed uPVC windows, which have replaced the original hot dipped galvanised metal casement windows. A veranda with a felted mono-pitch roof, carried on five square brick columns, fronts the full length of the elevation. The floor of the veranda has quarry tile paving and is fronted by a low brick walled flowerbed. Secondary-twelve light glazed timber screens occupy what would have originally have been open spaces between the brick columns.

The gable walls are each lit by a centrally set four light window flanked by a pair of tall two light windows, beneath flat concrete lintels. These windows have also been fitted with secondary uPVC double-glazing. All of the ground floor windows are closed internally by 6.3mm ( in) steel, light-tight shutters. A small glazed four light oculus which lights the attic is located towards the apex of each gable. The rear elevation is rather plain with, at its eastern end, a square brick chimney stack rising from a shouldered projection of the rest room fireplace. Four narrow frosted windows light the lavatories, which are set centrally within the length of the wall. The westernmost bay is occupied by a 4.87m (16ft) tall, flat roofed projection, which encloses a combined stair and loading well. The stair descends 3.04-m (10-ft) below ground level to the entrance passage of the R3 operations block. A pair of 2.13 x 2.74-m (7 X 9ft) steel doors in the east elevation of the projection allows access for heavy equipment, which could be slung on a traveller beam attached to an over-head, 30.4 X 12.7-cm (12 X 5in) RSJ beam.

Access to the interior of the guardhouse was not possible at the time of

fieldwork; however, it is known from original documents to consist of a guardroom in the western bay, a central corridor flanked by an armoury, a storeroom and a pair of lavatories, and a rest room in the eastern bay. A return from the corridor connects the guardroom and the entrance passage to the R3 operations block via the stair and loading well. A trap-door in the concrete floor of the attic is located over the return of the corridor, which allows access to four galvanised steel water tanks with a total capacity of 9091.94 litres (2000 gallons). In addition to the oculus windows noted previously, an original NC4F metal casement dormer window in the southern pitch of the roof also lights the attic. A square brick flue rises from the guardroom fireplace through the attic, to emerge as a short chimney stack at the ridge, which is currently capped and has an air raid siren placed on top of it.

R3 Operations Block

Apart from the combined sub-station / emergency exit and the ventilator cap of the outlet air duct no structural elements of the R3 operations block are visible above ground. The R3 was built using the 'cut and cover' technique. A large excavation was dug back into the landward slope of Bawdsey Cliff the base of which was only 1.82-m (6-ft) above the Ordnance Datum. The reinforced concrete structure was then built up on a rock cushion, some 1.29-m (4ft 3in) deep. The main structure is a two-storey 48.76 X 29.26 X 14.63-m (160 X 96 X 48-ft) reinforced concrete box, with 3.04-m (10-ft) thick walls, roof and foundation slab. The spoil from the excavation was used to cover the structure to a maximum depth of 4.34-m (14ft 3in) enhancing the protection factor against blast and Gamma radiation.

Access to the R3 ('The Hole') is through the guardhouse and the combined stair and loading well. A stairway descends 3.04-m (10-ft) to reach the floor of the 60.95-m (200-ft) long entrance passage (tunnel), which turns 45° towards the east and turns another 45° towards the north-east before entering the R3 via a set of blast doors and a dog-leg intended to reduce the effects of any blast damage by creating a plenium chamber.

A projection against the south-western end of the structure contains the cable shaft, the entrance passage dog-leg, and a transformer cubicle. A similar, but larger projection against the north-eastern end of the structure contains a gas filtration plant room, a cooling plant room, and the dog-leg passageway which leads up to the combined sub-station/emergency exit.

Some time after 1974, the thickness of earth cover over the R3 was increased by a further 3.04-m (10-ft), with the result that concrete retaining walls were built around the emergency exit and the ventilator cap of the air outlet duct.
The interior of the R3 was not accessible during the survey.

R17 (Type 84) Modulator Building

The Type 84 radar array consisted of a pair of 18.28 x 6.23-m (60ft x 20ft 8in) paraboloid dishes mounted back-to-back at the centre of a tubular beam. A pair

of girder frames, one at each end of the beam, was designed to support the hornfeeds. As originally conceived the front dish was to have operated as the L-Band radar, while the rear dish was to function as a narrow beam Mk X Selective Identification Feature (SIF) Interrogation Friend or Foe (IFF) aerial. This did not come to pass, and a conventional IFF aerial was attached to the tubular beam, below the front hornfeed stack. The array was carried by, and rotated on, a bolted-steel girder gantry, which straddled the modulator building. The array and the gantry were removed to, and re-erected at, RAF Bishops Court in 1970.

The modulator building is located adjacent to the south-western perimeter fence. It consists of two single-storey, cement rendered, flat-roofed ranges, inter-linked by a central passageway. Overall it measures 28.04 x 6.96-m (92ft x 22ft 10in). Latterly, it has been used as a crew room and store for the Bloodhound Armament Handling Flight and as a consequence all ventilator openings and a number of doorways have been blocked.

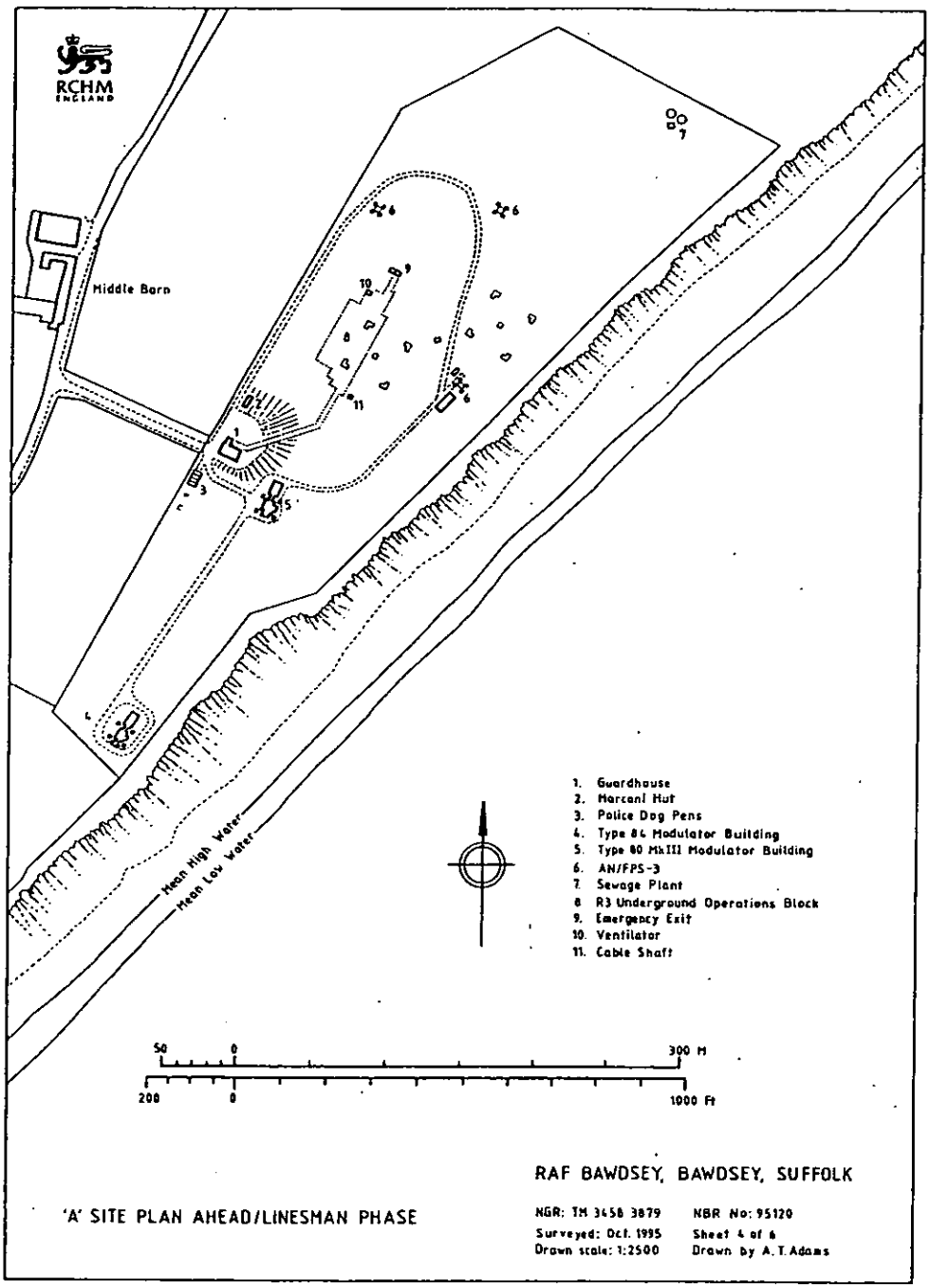
The northern range measures 12.49 x 7.31-m (41ft x 24ft) and stands to a height of 3.58-m (11ft 9in). It was originally divided into two chambers. The northern chamber was occupied by the switchroom and was accessed by a double door in the north-east elevation and a single doorway in the north-west. The southern chamber was used as the generator room, equipped with four generators. A fan and filter room would have been located on the roof over part of the generator room and the interlinking passageway, but this has been removed.

The southern range measures 9.14 x 9.14-m (30 x 30-ft) and stands to a height of 3.04-m (10-ft). It was occupied by the modulator room, which was equipped with a duplicate pair of modulators and D.C. Supply Cabinets. A slip ring connector placed centrally in the roof connected the modulators to the array above. Access to the modulator room was provided by a double doorway in the north-west and south-east elevations. The doorway in the south-east elevation was flanked by a projecting storeroom. Internally, access would also have been possible from the generator room via the linking passageway. The regulator annexe is attached to the south-west wall of the modulator room. This annexe would have contained two induction regulators.

R7 Radar Building

The Type 7 Mk3 array was located on a remote site on the Alderton Marshes, approximately 2km (1¼ miles) north-east of Middle Barn. The array was situated within a rectangular fenced enclosure, accessed by a track that ran from just north of Middle Barn Farm to Poplar Farm. Due to vehicle weight loading, three new bridges and one new culvert had to be built over the drains on the marshes. The site is presently wooded.

The Type 7 array was mounted on a R7 semi-sunken radar building (engineering well), and was associated with an IFF cubicle and a sub-station.


RCHM
ENGLAND
Middle Barn
Mean High Water
Mean Low Water
1. Guardhouse
2. Marconi Hut
3. Police Dog Pens
4. Type 84 Modulator Building
5. Type 80 MkIII Modulator Building
6. AN/FPS-3
7. Sewage Plant
8. R3 Underground Operations Block
9. Emergency Exit
10. Ventilator
11. Cable Shaft
50 0 300 M
200 0 1000 Ft
'A' SITE PLAN AHEAD/LINESMAN PHASE
RAF BAWDSEY, BAWDSEY, SUFFOLK
NGR: TM 3458 3879
NBR No: 95120
Surveyed: Oct. 1995
Sheet 4 of 6
Drawn scale: 1:2500
Drawn by A.T.Adams

The R7 building is a single storey, 16.93 X 5.63-m (56ft 7in X 18ft 6in) plan, reinforced concrete structure. The walls are built of 91.4-cm (3-ft) of reinforced concrete, coated on their outer surfaces with an asphalt dampcourse, which is protected by a 15.2-cm (6-in) outer layer of brick. The 91.4-cm (3-ft) thick reinforced concrete floor is laid on a 45.7-cm (1ft 3in) thick reinforced concrete raft or mattress, topped by a layer of 5-cm (2-in) pre-cast concrete slabs. The reinforced concrete roof is 91.4-cm (3-ft) thick at the ridge, falling to 91.14-cm (2ft 6in) at the edges.

The interior can be entered via one of two 60-cm (2-ft) square hatches in the roof - no mean feat when the R7 was operational, given that this had to be achieved while the aerial was rotating. For example, at a speed of 4 revolutions per minute (rpm), anyone wishing to enter the R7 would only have 7.5 seconds in which to do so. The interior is sub-divided into three 2.43-m (8-ft) high rooms, which once housed the transmitter, the monitor receiver, the aerial turning gear, and various other pieces of equipment. Each room is served by a 1.8 X 1-m (6ft X 3ft 6in) equipment trapdoor in the roof. Given its isolated position, the R7 was not fitted with a flushing toilet room; the only concession to a call of nature took the form of an Elsan closet in Room 3.

Administrative and Domestic Buildings

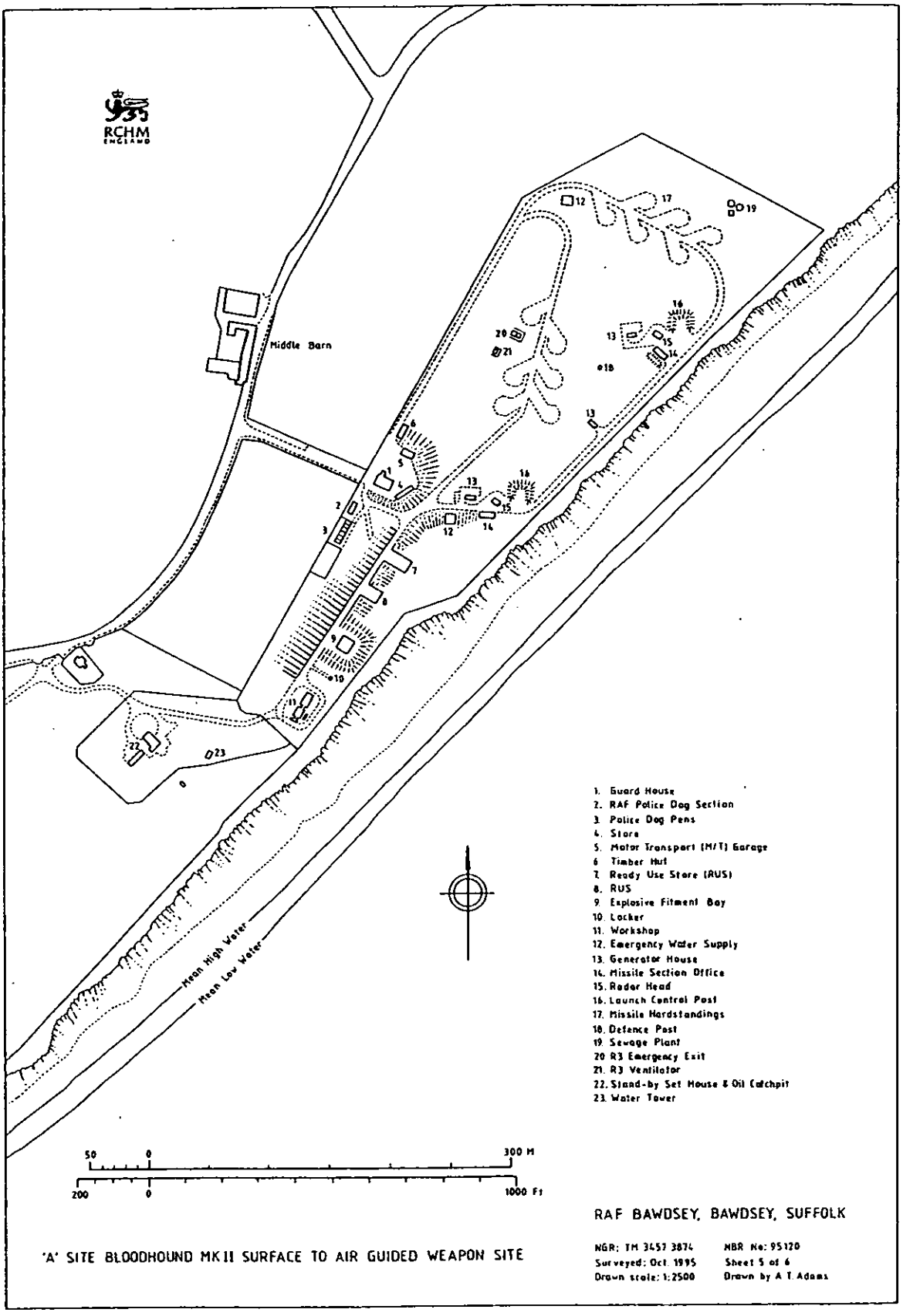
The administrative and domestic buildings were located to the north and north-west of Bawdsey Manor, near to the pre-war Filter School and the Research Block (bldgs. 79 and 80). Very little now remains - apart from the guardhouse and armoury, the post office, an inflammables store, and the motor transport office. All other ROTOR period structures have been demolished.

The majority of the structures were built on a terrace cut into the northern slope of the headland. They were predominantly built using Ministry of War Production (MOWP) standard concrete hutting. A number of structures were also built using the modular Seco Hut system. These included - four senior NCO quarters, a senior NCO annexe (Ablutions), a Roman Catholic church, an administration office, an airmen's/airwomen's mess and cinema, a rations store, three recreation and club blocks, a NAAFI staff quarters, and a families shop.

**Bloodhound Phase II Surface to Air Guided Weapon (SAGW) Site**

The Bloodhound missile site is located within the perimeter of the former ROTOR period 'A' Site. The site was occupied by 'C' Flight No.85 Squadron and was divided into two Missile Sections identified by colour codes, each armed with six Bloodhound Mk II missiles and re-loads, commanded by a launch control post (LCP) linked to a target illuminating radar (TIR).

The construction of the Bloodhound facilities resulted in the obliteration of the majority of the ROTOR and PLAN AHEAD period surface structures; those




'A' SITE BLOODHOUND MK II SURFACE TO AIR GUIDED WEAPON SITE

RAF BAWDSEY, BAWDSEY, SUFFOLK

NGR: TM 3457 3874 NBR No: 95120
Surveyed: Oct. 1995 Sheet 5 of 6
Drawn scale: 1:2500 Drawn by A T Adams

that remained were adapted to new uses. The guardhouse retained its original function; a control room was established in the R3, and the former Type-84 modulator building was converted into a workshop, stores and rest room for the missile handling flight.

Access to the site was still provided by the gateway to the north-west of the guard house. A wicket gate allowed pedestrian access. The RAF police dog section hut (bldg 330) was located immediately to the south-west of the gate, with a six-bay chain-link dog pen and run to the rear. Two new tarmacadam surfaced concrete roads were built to service the twelve missile hardstandings and the two launch control posts, with their associated radar heads.

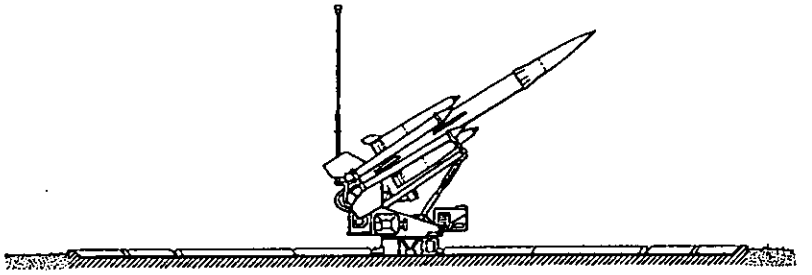
Missile Sections

The two missile sections operated a total of twelve missile hardstandings, one group of six near the northern perimeter, and the other adjacent to the R3 block. A missile hardstanding consists of a simple octagonal reinforced concrete floor, with four centrally set holdfast bolts to receive a launcher. A cable duct with galvanized steel covers is recessed into the concrete floor and terminates to one side of the holdfast. Six sides of the octagonal floor are edged with a low efflux deflecting concrete wall, while the remaining sides are occupied by a concrete access road which approaches the hardstanding at an oblique angle.

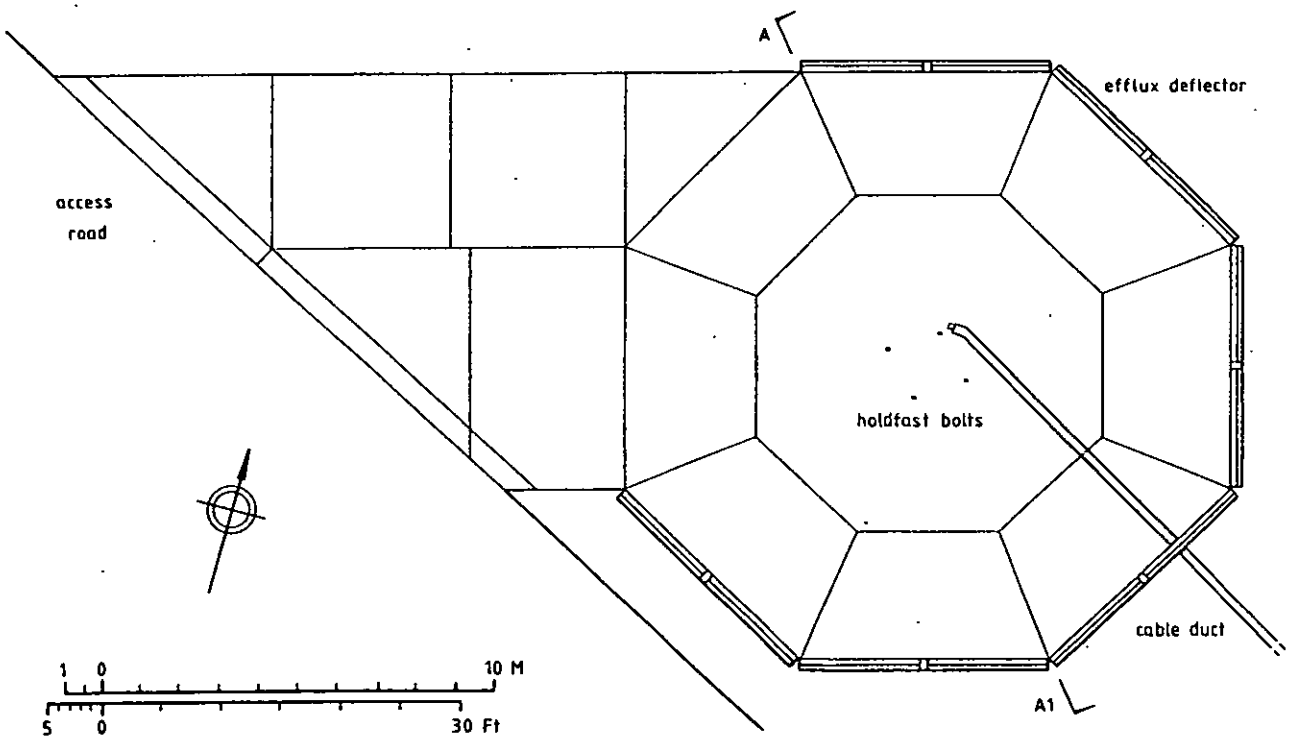
The missile sections were each provided with a concrete hardstanding for a launch control post and a radar head. A launch control post consisted of a portable cabin with its associated air conditioning units, tubular cable racks, and cable drums, which were placed on the hardstanding. The LCP hardstanding is a rectangular plan concrete floor with recessed cable ducting protected by earth revetments on three sides. It is physically attached to the radar head hardstanding on the northern side. Sanitary arrangements for the LCP crew originally consisted of nothing more sophisticated than a Presco Portaloo chemical closet, recessed into the rear revetment wall. During 1990, the comfort of the duty crews of the missile sections was greatly improved by the provision of two section offices, adjacent to the radar heads.

The radar head hardstandings are roughly rectangular in plan and are serviced by the access road that runs along the cliff-top. Both hardstandings were originally equipped with the Type 87 target illuminating radar (TIR), mounted on an angular semi-portable plinth. These radars quickly gained the nickname 'Daleks', due to their similarity to the machines from the BBC 'Doctor Who' television programme.

During 1988, the Type 87 radars were dismantled and replaced by a pair of Type-86 sets. The Type-86 radar was mounted on the roof of a caravan, but due to its smaller size, it was prone to 'ground clutter'. To overcome this problem the two Type-86 radar caravans at RAF Bawdsey were raised 4-m (14-ft) off the ground and placed on galvanized steel platforms fitted to the




SECTION A-A1 (MISSILE & LAUNCHER RECONSTRUCTED)




BLOODHOUND MK II MISSILE LAUNCHER HARDSTANDING

RAF BAWDSEY, BAWDSEY, SUFFOLK

NGR: TM 3478 3901 NBR No: 95120

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Drawn scale: 1:100 Drawn by A.T. Adams

RCHM ENGLAND

roofs of the disused Type-87 plinths. These plinths were still in situ at the time of survey.

Missile Handling Flight

The missile handling flight facilities were built to the east of the pre-existing road from the guardhouse to the Type-84 modulator building. They included two ready-use stores (RUS), an explosive fitment bay and a locker. A total of twelve re-load rounds were held on skids in the two ready-use stores, each Bloodhound being connected to a tube which supplied de-humidified air to the electronics.

Each RUS consists of an open rectangular plan concrete floor cut back into the slope of the hill, with three reinforced concrete retaining walls forming a revetment. The retaining walls were further reveted with spoil, and topped with timber fencing. The open side of the RUS allowed direct access to the service road for the purpose-designed side-lifting missile transporters.

The appearance of the explosive fitment bay (bldg 340) is somewhat akin to a modern farm building built to a 4-bay square plan, using a steel girder frame, with a depressed gable corrugated asbestos roof. Each end bay is braced with a tubular steel girder, with lattice girder wind bracing in the roof above. A low brick wall encloses the sides of the structure, with the majority of the wall height clad with plastic-coated corrugated steel sheeting. There are no windows and protected fluorescent tubes provide artificial lighting, with the electrical switches located externally on the north-east wall. Access to the interior is provided by a door and a large steel roller shutter in the north-west elevation, while an emergency exit is located in the south-east wall. A single clerestory ventilator set centrally in the ridge of the roof ventilates the interior.

The explosive fitment bay is contained within a revetment constructed in a similar manner to those of the ready-use stores. Unlike the RUS, the earth revetments slope at an angle of 45° away from the structure to deflect any blast upwards, should a mishap occur. The front of the revetment opens out onto the service road and is shielded to the north-west by an earth reveted, reinforced concrete traverse, as a further precaution against explosion.

Bloodhound Mk II Surface to Air Missile System

The British Aerospace Bloodhound Mk II surface-to-air missile (SAM) is a derivative of the Bristol / Ferranti Bloodhound Mk I, Britain's first surface-to-air guided weapon (SAGW) system to enter operational service. The missile was originally conceived in response to a requirement issued by the Army in 1950. The Bloodhound missile was a radar-guided weapon, using an internal scanning receiver, which 'locked-on' to a target that was 'illuminated' by a transmitting radar on the ground – i.e. it was a 'semi-active homing weapon'.

Two I/J-band (formerly X-band) continuous-wave 'Doppler' target illuminating radars (TIR) were utilised with the Bloodhound Mk II missile: the

Ferranti Type-86 (Indigo Corkscrew/Firelight) and the Marconi Type-87 (Scorpion). The main differences between these two systems were detection range, physical size, and portability. The Type-86 consisted of an articulated four-wheeled caravan with the radar array mounted on the roof. The array was cone-mounted, and comprised a main 2.13-m (7-ft) circular transmitter dish flanked by an 'orange peel segment' shaped receiver and a small circular jamming assessment aerial. The whole unit was air-transportable in a Blackburn Beverley or a Shorts Belfast aircraft.

Due to its relatively small size, the Type-86 had the disadvantage of reduced range: a Canberra-size aircraft at 166.56-km (103 miles), as against the Type-87' which could achieve a range of 273.58-km (170 miles) for the same target. The Type-87 was twice the size of the Type-86, which permitted the longer target range to be achieved, and it was also more reliable as all circuits were duplicated. The sheer size of the Type-87 was nevertheless a disadvantage, for given its mighty 50.802-tonnes (50-tons) weight and the fact that it was mounted on a plinth, it could hardly be considered as readily moveable. It was air-transportable, but only after it had been broken down into smaller elements.

Both the Type-86 and the Type-87 were used at different times for target illumination at RAF Bawdsey. These TIR sets were allocated or 'put-on' to hostile plots by the Southern Sector Controller at The Master Radar Station at RAF Neatishead (NBR File No. 96900), using information provided by the long range Type-84 and Type-85 control and reporting radars. Once the target had been located the radar at RAF Bawdsey would track it automatically, with the missile launchers following the arrays movement in unison. The Control Room would then select one or other of the two missile sections to carry out the interception. The engagement controller in the launch control post (LCP) would then choose the optimum moment to fire. Within a fraction of a second of pressing the launch button, the computer would automatically assess the six missiles in the section and the first one to be found fully serviceable would be fired.

The Bloodhound missiles were mounted on Type 202 'zero-length' launchers. The air conditioning, electrical and hydraulic services for both the missile and the launcher were fitted in removable units on the mounting itself. The missiles were loaded onto the launcher by Lancer Boss side-loading transporters. During loading, the launcher beam was hydraulically lowered to the horizontal to accept the missile, which once attached, was raised to a fixed elevation of 34°. A telescopic stalk aerial was attached to the rear of the launcher, which received command signals from the launcher illumination aerials on the TIR cabin, to ensure that the missile's receiver dish was tuned to acquire the selected target and in order that the launcher would continuously track the target in azimuth.

The Bloodhound Mk II missile has an overall length of 8.45-m (27 ft 9 in)

consisting of a cylindrical body with a pointed dielectric ogival nose cone. It was divided into a forward pressurised guidance bay containing the radar receiver dish and the missile's electronic controls, and a rear section which contained the war head, fuel tanks, and an auxiliary equipment bay. This latter compartment housed the fuel pumps, high-pressure hydraulic accumulators, hydraulic pumps and the Mach number control unit.

Two Rolls-Royce Thor ramjet motors were fixed on pylons above and below the missile. Four Royal Ordnance Factory (ROF) Gosling solid booster rocket motor with large canted stabilising fins were equi-spaced around the main body. The rocket motors were pinned down by a thrust yoke at the tail of the missile and were held in place against the centre section by ring brackets.

On ignition, a total of 45,360-kg (100,000-lb) of static thrust was developed by the four ROF Gosling motors, which, given that the missile only weighed 1;814-kg (4,000-lb), resulted in the Bloodhound shearing its launcher bolts and attaining 0 - 1,200 Km/h (0 - 760 mph), the speed of sound, within its own length. Once at Mach 1, the two liquid fuelled Thor ramjet engines ignited and, four seconds after launching, the Gosling rockets accelerated the missile to Mach 2.5, by which time the motors had burnt out.

At burn-out, the aerodynamic drag on the Gosling rockets, together with the radial lift generated by the fins, forced the spent motors to slide rearwards as a unit, until they separated from the thrust yoke and 'petaled' outwards to fall away from the missile body, automatically unlocking the control surfaces. From this point onwards, to a maximum range that would have been in excess of 185.07-km (115 miles), the missile was powered on its interception course by the pair of Thor ramjets, and homed onto its target using the 'twist and steer' method of control. In reality, due to the likely evasive actions taken by the target, the range at which an interception would have taken place would have been considerably less: minimum impact range at low-level 11.10-km (6.9 miles), maximum impact range at high-level 130.80-km (86.25 miles). The missile was capable of intercepting targets at heights of between 45.72 and 19,812-m (150 - 65,000-ft).

Due to the rapid acceleration forces exerted on the missile during the boost phase, it was impracticable to maintain 'target lock' and the flight path followed a ballistic trajectory. Once the boost phase of the launch had ceased the missile stabilised in flight and the on-board receiver would have acquired and homed onto the reflected radar signal off the target aircraft. To ensure the missile was located in the correct area of the sky and tuned to acquire the target, a computer system called 'Argus' was used to provide the necessary computations. By determining the altitude, azimuth and slant range of the target, Argus was capable of selecting one of four ballistic trajectories prior to launch:

a. Climb at 40° to a cruise altitude of 55,000 ft.

b. Climb at 40° to a cruise altitude of 40,000 ft.
c. Climb at 15° until 25 seconds before impact.
d. Full proportional navigation from the end of the boost phase.

While in the cruise phase the missile was controlled by its Ferranti guidance equipment, which obtained the pitch and yaw information from the radar receiver and processed it to control the hydraulic system that actuate the all-moving monoplane wings. The wings were moved asymmetrically for roll and symmetrically to control pitch. The Bloodhound used a proportional navigational course to intercept its target; i.e. the rate at which the weapon changed its course was proportional to the rate of change of the angle of sight between the missile and the enemy aircraft. Thus, the missile's radar receiver dish was pointing directly at the target, while the guidance system would be steering the missile to a predicted interception point along a continually adjusted course, dependent on the enemy aircraft's movements.

Although the guidance system used by the Bloodhound had been proved to be sufficiently accurate physically to strike a target aircraft, the warhead was detonated by a Thorn-EMI radar proximity fuse, rather than by impact. The Bloodhound missile could be armed with one of two types of warhead: high explosive (blast) or continuous rod, usually the latter. A blast warhead damages an aircraft by the shock wave and heat produced by an explosion and, coincidentally, by the fragmentation of the casing. The main disadvantage of a blast warhead is the fact that it becomes progressively less effective at altitudes beyond 7,000-m (22,965-ft), due to the low air density.

A continuous rod warhead consists of a wave shaped high explosive charge surrounded by a bundle of welded metal rods. It achieves its destructive effect by the detonation of the wave shaping charge, which expands the metal rods outwards into a rotating hoop some 37-m (120 ft) in diameter, with a strike velocity of around 1000 m/sec. At this stage the spinning mass of rods can be likened to a circular saw, which would slice through the structure of any aircraft it came into contact with. A fraction of a second later, the rods will separate, losing velocity and direction, before tumbling to earth.

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Report by: Roger J C Thomas.
Medium Format Photography: Roger J C Thomas.
Drawn Archive: Allan T Adams.

## ACKNOWLEDGEMENT

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| | AIR 20/10699, | Signal Distribution Diagram. R3 & R6 Building Console Layout. |
| | AIR 20/7584, | Steel Self-supporting Towers 350'- high, General Arrangements. |
| | AIR 10/6123, | Typical GCI site plan. |
| RAF Museum,<br>Grahame Park Way<br>Hendon,<br>London, NW9 5LL. | 3415C/51, | Bawdsey, Site Plan Showing Layout of Administrative & Domestic Buildings. |

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Cathodic Protection Scheme - RAF Bawdsey (general layout 'as fitted'). Spencer & Partners: drawing AMBD/1.

Access Road from Bawdsey - Woodbridge Road to Remote Site. Works Area Drawing - L/BDY/2/55.

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AA96/04641 BLOODHOUND SITE. ARMAMENT HANDLING FLIGHT, READY-USE STORE (RUS). GROUND-LEVEL VIEW OF NORTHERN BAY. RUS 1, BUILDING 341.

AA96/04642 BLOODHOUND SITE. BUILDING 340, ARMAMENT HANDLING FLIGHT. EXPLOSIVE FITMENT BAY (EFF), VIEWED FROM THE NORTH-NORTH-EAST.

AA96/04643 BLOODHOUND SITE. BUILDING 340. ARMAMENT HANDLING FLIGHT. EXPLOSIVE FITMENT BAY (EFF), VIEWED FROM THE SOUTH.

AA96/04644 BLOODHOUND SITE. EMERGENCY WATER SUPPLY, 114,000 LITRES. VIEWED FROM SOUTH-WEST.

AA96/04645 BLOODHOUND SITE. BUILDING 333. GENERATOR HOUSE AND TRANSFORMERS, VIEWED FROM THE SOUTH-EAST.

AA96/04646 BLOODHOUND SITE. BUILDING 337, SECTION OFFICE/CANTEEN.VIEW FROM THE SOUTH-WEST.

AA96/04647 BLOODHOUND SITE. LAUNCH CONTROL POST REVETMENT ADJACENT TO BUILDING 337. ELEVATED VIEW FROM SOUTH-WEST.

AA96/04648 BLOODHOUND SITE. TYPE 87 RADAR BASE UNIT, WITH

SECONDARY TYPE-86 RADAR CARAVAN PLATFORM. ADJACENT TO BUILDING 337.

AA96/04649 BLOODHOUND SITE. LOW-LEVEL VIEW OF TYPE-87 RADAR BASE UNIT, & SECONDARY TYPE-86 RADAR CARAVAN PLATFORM. ADJACENT TO BUILDING 337.

AA96/04650 BLOODHOUND SITE. DETAIL OF TYPE-86 RADAR CARAVAN PLATFORM ADJACENT TO BUILDING 337.

AA96/04651 BLOODHOUND SITE. GEN VIEW OF GENERATOR HOUSE, BUILDING 332, RADAR BASE UNIT AND THE SECTION OFFICE/CANTEEN BUILDING 335.

AA96/04652 BLOODHOUND SITE. BUILDING 332, GENERATOR HOUSE, VIEWED FROM THE SOUTH-EAST.

AA96/04653 BLOODHOUND SITE. ELEVATED VIEW OF RADAR BASE UNIT ADJACENT TO BUILDING 335. VIEW FROM THE WEST.

AA96/04654 BLOODHOUND SITE. DEFENCE POST NORTH OF BUILDING 334.VIEW FROM THE NORTH.

AA96/04655 BLOODHOUND SITE. MISSILE HARDSTANDING ADJACENT TO R3 EMERGENCY EXIT. ELEVATED VIEW FROM SOUTH-WEST.

AA96/04656 BLOODHOUND SITE. MISSILE HARDSTANDING, DETAIL OF HOLDFAST AND CABLE DUCT.

AA96/04657 BLOODHOUND MK II SURFACE-TO-AIR MISSILE. VIEW FROM FRONT.

AA96/04658 BLOODHOUND MK II SURFACE-TO-AIR MISSILE. OBLIQUE VIEW FROM RIGHT.

AA96/04659 BLOODHOUND MK II SURFACE-TO-AIR MISSILE. OBLIQUE VIEW FROM LEFT.

AA96/04660 TYPE-86 TARGET ILLUMINATING RADAR "FIRELIGHT" I/J-BAND RADAR CARAVAN, BUILT BY FERRANTI.

AA96/04661 LAUNCH CONTROL POST (LCP) CABIN AND AIR-CONDITIONING UNIT.

AA96/04743 BUILDING 36A. BOATHOUSE/YACHT CLUB VIEWED FROM THE SOUTH-EAST.

AA95/05360 TRUNCATED TRANSMITTER TOWER, VIEW FROM SOUTH-WEST.

AA95/05361 TRUNCATED TRANSMITTER TOWER, VIEW FROM THE WEST.

AA95/05362 TRANSMITTER {TX} BLOCK, VIEW FROM THE WEST.

AA95/05363 TRANSMITTER {TX} BLOCK, VIEWED FROM THE NORTH-WEST.

AA95/05364 TRANSMITTER {TX} BLOCK, VIEWED FROM THE SOUTH-WEST.

AA95/05365 TRANSMITTER {TX} BLOCK, TRANSMITTER ROOM VIEWED FROM THE WEST.

AA95/05366 TRANSMITTER {TX} BLOCK, SUB-STATION, DETAIL OF SWITCHGEAR.

AA95/05367 TRANSMITTER {TX} BLOCK, DETAIL OF EXTERNAL VENTILATOR.

AA95/05368 TYPE 24 PILLBOX ADJACENT TO ROAD FROM THE NORTH-EAST LODGE, VIEWED FROM THE SOUTH.

AA95/05369 TYPE 24 PILLBOX WITH SECONDARY PROTECTIVE SKIRT, NEAR THE BURIED RESERVE, VIEWED FROM THE WEST.

AA95/05370 BURIED RESERVE TRANSMITTER BUILDING, ENTRANCE HATCH VIEWED FROM THE NORTH-WEST.

AA95/05371 BURIED RESERVE TRANSMITTER BUILDING, VIEW UP THE STAIRS TO THE ENTRANCE HATCH.

AA95/05372 BURIED RESERVE TRANSMITTER BUILDING, DETAIL OF

FILTER IN PLANT ROOM.

AA95/05373 BURIED RESERVE TRANSMITTER BUILDING, TRANSMITTER ROOM VIEWED FROM THE SOUTH.

AA95/05374 BURIED RESERVE TRANSMITTER BUILDING, TRANSMITTER ROOM VIEWED FROM THE NORTH.

AA95/05375 BURIED RESERVE TRANSMITTER BUILDING, DETAIL OF ESCAPE HATCH IN THE NORTH-WEST WALL.

P/G28617 SF BAWDSEY OFFICERS MESS.

BB98/10067 COPY PHOTOGRAPH OF A TYPE-13 RADAR ON 12 FT PLINTH 'D'.

BB98/10069 COPY PHOTOGRAPH OF A TYPE-14 MK 9 RADAR ON 25 FT GANTRY PLINTH 'I'.

## LIST OF LOW-LEVEL OBLIQUE AERIAL PHOTOGRAPHS HELD BY RCHME.

| NGR Index No. | Accession No. | Frame | Date | Type |
|---|---|---|---|---|
| TM3438/1 - 6 | NMR 12647 | 34 – 39 | 12/04/95 | 6x6 B&W |
| TM3438/7 - 12 | NMR 15256 | 22 - 27 | 12/04/95 | 35mm Col |
| TM3539/1 - 2 | NMR 15256 | 33 - 34 | 12/04/95 | 35mm Col |
| TM3540/1 - 6 | NMR 12647 | 40 - 45 | 12/04/95 | 6x6 B&W |
| TM3540/7 - 11 | NMR 15256 | 28 - 32 | 12/04/95 | 35mm Col |
| TM3337/9 - 10 | NMR 18123 | 18 - 19 | 13/08/98 | 35mm Col |
| TM3338/2 - 3 | NMR 18123 | 20 - 21 | 13/08/98 | 35mm Col |
| TM3239/1 - 2 | NMR 18128 | 04 - 05 | 13/08/98 | 6x6 B&W |
| TM3239/3 - 7 | NMR 18123 | 22 - 26 | 13/09/98 | 35mm Col |
| TM3438/19 - 25 | NMR 18123 | 11 - 17 | 13/08/98 | 35mm Col |
| TM3337/6 - 8 | NMR 18128 | 01 - 03 | 13/08/98 | 6x6 B&W |
| TM3438/15 - 18 | NMR 18127 | 21 - 24 | 13/08/98 | 6x6 B&W |

## Schedule of Surviving Structures/Features, 14th October 1995

| Structure/Feature | National Grid Reference |
|---|---|
| **MAIN SITE** | |
| Piquet Post | TM 34231 38552 |
| Sub-station | TM 34212 38538 |
| Chain Home Tx Tower No.2 (truncated) | TM 34080 38258 |
| Chain Home Tx Tower No.4 (foundations only) | TM 34108 38358 |
| Chain Home Tx Tower No.3 (foundations only) | TM 34096 38315 |
| Chain Home Extra Low Transmitter Hut (crop mark) | TM 34108 38358 |
| Concrete Hut Footing | TM 34096 38315 |
| 'A' Type 'Protected' Transmitter Block | TM 34120 38278 |
| Buried Reserve Transmitter Block | TM 34325 38446 |
| 120 ft 'Buried Reserve' Tx tower (foundations only) | TM 34310 38430 |
| Air Ministry Research Station, Tx Hut 3 (footings only) | TM 34290 38426 |
| Air Ministry Research Station, Rotary Hut 90 (base only) | TM 34291 38410 |
| 247 ft Tx Tower (foundation blocks only) | TM 34282 38419 |
| Concrete Hut Base | TM 34352 38406 |
| Combined Transmitting Laboratory & Stand-by Bldg. | TM 34305 38490 |
| Oil Tank Catchpit | TM 34292 38476 |
| Water Tower | TM 34352 38476 |
| Inflammables Store | TM 33572 37984 |
| 'A' Type 'Protected' Receiver Block | TM 33658 38027 |
| 240 ft Receiver Tower No.5 (foundation blocks only) | TM 33847 38030 |
| 240 ft Receiver Tower No.7 (foundation blocks only) | TM 33594 38011 |
| 240 ft Receiver Tower No.6 (crop mark only) | TM 33694 38014 |
| IFF Cubicle | TM 33590 38012 |
| Central Heating Station | TM 33698 37952 |
| Motor Transport (M/T) Office | TM 33595 38023 |
| Motor Transport Garage and Workshop | TM 33651 37992 |
| Fire Tender Crew Room (former M/T Office) | TM 33627 37972 |
| Gas Decontamination Building | TM 33543 37980 |
| Post Office | TM 33456 37973 |
| Airmen's Barrack Block (former Research Block) | TM 33562 38088 |
| Oil and Paint Store | TM 33540 38143 |
| Senior NCO's Mess (former Filter School) | TM 33472 38008 |
| Sub-station | TM 33535 38094 |
| Sub-station | TM 33900 38438 |
| Sailing Club | TM 33202 37899 |
| Guard House and Armoury | TM 33223 37866 |
| Ferry Shelter | TM 33172 37882 |

| | |
|---|---|
| Jetty | TM 33147 37879 |
| Pillbox | TM 34243 38842 |
| Pillbox | TM 34208 38659 |
| Pillbox | TM 34309 38556 |
| Pillbox | TM 34028 38315 |
| Pillbox | TM 33314 38008 |
| Pillbox | TM 33430 37980 |
| Pillbox | TM 33522 38230 |
| Pillbox | TM 33608 38232 |
| Pillbox | TM 33189 38330 |
| Gun Post (crop mark) | TM 33960 38400 |
| 2-pdr AA Ammunition Storehouse | TM 33220 37650 |
| Concrete Anti-tank Cubes | TM 33372 37666 |
| Concrete Anti-tank Cubes | TM 33916 38055 |

'A' Site

| | |
|---|---|
| Guard House | TM 34500 38710 |
| R3 Underground Operations Block | TM 34582 38785 |
| R3 Emergency Exit and Sub-station | TM 34610 38833 |
| Sewage Plant | TM 34801 38945 |
| Type 84 Modulator Building | TM 34432 38518 |
| RAF Police Dog Section Hut | TM 34480 38692 |
| Dog Pens | TM 34470 38671 |
| Mast Base | TM 34400 38510 |
| Pyrotechnic Locker | TM 34457 38544 |
| Explosive Fitment Bay | TM 34471 38575 |
| Ready-use Store (RUS) | TM 34494 38614 |
| Ready-use Store (RUS) | TM 34511 38636 |
| Store | TM 34519 38700 |
| Motor Transport Garage (Lancer Boss Side-loader) | TM 34523 38733 |
| Air Ministry Timber Sectional Hut | TM 34518 34554 |
| EWS 114,000-ltrs (Static Water Tank) | TM 34554 38676 |
| Generator House | TM 34570 38692 |
| Section Office | TM 34596 38675 |
| Radar Head | TM 34600 38690 |
| Launch Control Post Hardstanding | TM 34608 38694 |
| Missile Hardstanding | TM 34599 38774 |
| Missile Hardstanding | TM 34628 38758 |
| Missile Hardstanding | TM 34609 38801 |
| Missile Hardstanding | TM 34636 38788 |
| Missile Hardstanding | TM 34621 38844 |

| | |
|---|---|
| Missile Hardstanding | TM 34640 38828 |
| Generator Building | TM 34676 38755 |
| Generator Building | TM 34714 38836 |
| Defence Post | TM 34681 38807 |
| Section Office | TM 34730 38814 |
| Radar Head | TM 34731 38828 |
| Launch Control Post Hardstanding | TM 34746 38830 |
| Missile Hardstanding | TM 34756 38892 |
| Missile Hardstanding | TM 34779 38908 |
| Missile Hardstanding | TM 34724 38908 |
| Missile Hardstanding | TM 34748 38926 |
| Missile Hardstanding | TM 34693 38926 |
| Missile Hardstanding | TM 34715 38942 |
| EWS 114,000-ltrs (Static Water Tank) | TM 34656 38945 |

## RAF BAWDSEY (Main Site) 1952, Schedule of Buildings.

| Bldg.No. | Function | Drg.No. | Cons | Status |
|---|---|---|---|---|
| 1 | Guardhouse & Armoury | 390A/50 | MOWP | e |
| 2 | Sick quarters / Church (RC) | 405A/50 | Seco | d |
| 3 | Administration Offices | 397/50 | Seco | d |
| 4 | Inflammables Store | 390A/50 | MOWP | e |
| 5 | Aviation Fuel Store | 390A/50 | Brick | d |
| 6 | Motor Transport (M/T) Office | 406/50 | MOWP | e |
| 7 | Post Office | 390A/50 | MOWP | e |
| 8 | Fuel Compound | 604/51 | Wire | d |
| 9 | Central Heating Station | 1805/51 | Brick | e |
| 10 | Stand-by Set House | 1091/52<br>98A/52<br>3449A/51 | Brick | d |
| 11 | Piquet Post | ..... | MWOP | e |
| 12 | A-B Senior NCO single qtrs. (Men) 395/50 | Seco | d | |
| 13 | Senior NCO single qtrs. (Men) 395/50 | Seco | d | |
| 14 | Senior NCO Annexe | 395/50 | Seco | d |
| 15 | Main Stores | 3416/51 | Pre.ex | e |
| 16 | Main Stores | 3416/51 | Pre.ex | e |
| 17 | Fire Fighting Water Tank | ..... | Pre.ex | e |
| 18 | Senior NCO single qtrs. (Women) | 395/51 | Seco | d |
| 19 | ..... | | | d |
| 20 | Airmen's / Women's Cinema | 379/50<br>2239/51 | Seco | d |
| 21 | Ration Store | 379/50 | Seco | d |
| 22 | Contractor's Store | 379/50 | Pre.ex | e |
| 23 | Messman's Quarters | 3219/47 | Seco | ns |
| 24 | Airmen's / women's Club | 375/50 | Seco | d |
| 25 | Corporal's Recreation Block | 375/50 | Seco | d |
| 26 | Officer's Mess for 32, Qtrs for 22 | 4915/51 | Pre.ex | e |
| 27 | Airmen's / women's Recreation Block 375/50 | Seco | | d |
| 28 | NAAFI Staff Quarters | 375/50 | Seco | d |
| 29 | A-E Airmen's Single Quarters for ten men each | 395/50 | MOWP | d |
| 30 | A-B Airmen's Single Quarters | 395/50 | MOWP | d |

**RAF BAWDSEY (Main Site) 1952, Schedule of Buildings.** Cont'd.

| | | | | |
|---|---|---|---|---|
| 31 | A-C Airmen's Annexe | 395/50 | MOWP | d |
| 32 | ..... | | | |
| 33 | ..... | | | |
| 34 | ..... | | | |
| 35 | A-N Airwomen's Single Qtrs | 395/50 | MOWP | d |
| 36 | A-O Airwomen's Single Qtrs | 395/50 | MOWP | d |
| 37 | A-N Airwomen's Annexe | 395/50 | MOWP | d |
| 38 | Airwomen's Annexe & Hairdresser's | 2790A/51 | MOWP | d |
| 39 | Airwomen's Fuel Store | 2224/51 | Brick | d |
| 40 | ..... | | | |
| 41 | ..... | | | |
| 42 | ..... | | | |
| 43 | Families Shop (site for) | 405A/50 | Seco | ? |
| 44 | Airwomen's Single Quarters | 52987/51 | Pre.ex | e |
| 45 | Sports Pavilion | ..... | Pre.ex | |
| 46 | A-D Tennis Courts | ..... | Pre.ex | |
| 47 | Cricket Table (pitch) | ..... | ..... | e |
| 48 | Football Pitch | ..... | ..... | e |
| 49 | Hockey Pitch | ..... | ..... | |
| 50 | Rugby Pitch | ..... | ..... | |
| 51 | Lecture Block | ..... | 'B' Hut | d |
| 52 | Guard Room | ..... | 'B' Hut | d |
| 53 | NAAFI Airmen's Institute | ..... | 'B' Hut | d |
| 54 | Sick Quarters | ..... | 'B' Hut | d |
| 55 | A-B Airmen's Single Qtrs & Ablutions & Lavatories | ..... | 'B' Hut | d |
| 56 | ..... | | | |
| 57 | ..... | | | |
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