



ENGLISH HERITAGE

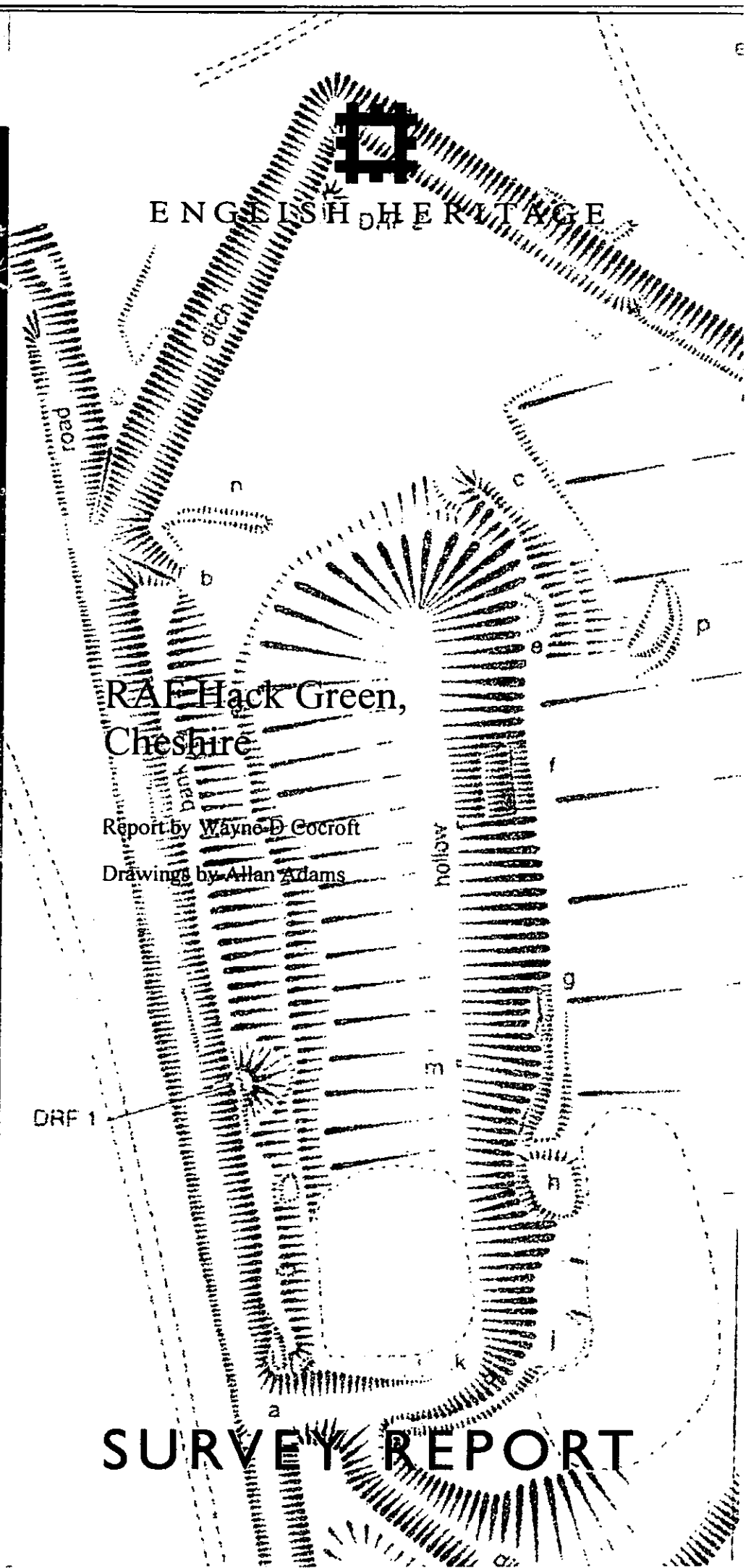
RAF Hack Green, Cheshire

Report by Wayne D Cocroft

Drawings by Allan Adams

DRF 1

SURVEY REPORT



COLD WAR PROJECT

SURVEY REPORT

RGHQ 10.2

**Hack Green
Cheshire**

NBR No: 96044
NMR No: SJ 64 NW 15
NGR: SJ 645 479
Hob UID: 1086498

November 1998

Investigated by Wayne Cocroft and Roger Thomas
Report by Wayne Cocroft
Drawings by Allan Adams
Photography by Roger Thomas and Bob Skingle

© Crown copyright.RCHME

Cambridge office: RCHME, Brooklands, 24 Brooklands Avenue, Cambridge, CB2 2BU
Tel: 01223 324010 Fax: 01223 311203 e-mail: Cambridge@rchme.gov.uk

Headquarters: RCHME, National Monuments Record Centre, Kemble Drive, Swindon, Wiltshire, SN2 2GZ.
Tel: 01793 414600 Fax: 01793 414707 e-mail: info@rchme.gov.uk World Wide Web: <http://www.rchme.gov.uk>

CONTENTS

Summary	1
Introduction	2
Radar Station	3
Early Second World War stop line and bombing decoy	3
Ground Control Interception Radar Station	3
Rotor period Radar Station	5
R6 Structure	6
Sub-station	7
Sewage plant	7
The 'Happidrome'	7
Radar arrays	8
Wireless stations	8
Domestic site and housing	9
Regional Government Headquarters 10.2	11
The R6 Structure	11
Exterior	11
Interior	12
Site archive	14
Acknowledgement	14
Sources	15
Primary	15
Public Record Office	15
PSA photographs, NMR Collection	16
Air photographs consulted, held by NMR	16

Drawings consulted on site 16

Air Defence Battle Command and Control Museum 16

Secondary 16

Figures

Site plan of Hack Green about 1953

RGHQ Plan of Lower Floor

RGHQ Plan of Upper Floor

Plan of Mezzanine floor

SUMMARY

Regional Government Headquarters (RGHQ) 10.2 Hack Green is a semi-sunken, heavily protected bunker. In the event of nuclear war, it was envisaged that the central government administration of the region would be conducted from this bunker. The headquarters reused an earlier R6 type bunker, constructed in early 1950s as part of the Rotor radar programme. Which itself re-occupied the site of a wartime radar station.

The RGHQ sits at the centre of a complex sequence of military land use, which has been adapted since the Second World War to match changing defence needs. This report will describe the features of this landscape and the final form of the R6 structure, after it was converted into a Regional Government Headquarters.

INTRODUCTION

Hack Green is a small dispersed rural hamlet, which lies in the southern part of the Cheshire Plain over pleistocene till deposits (BGS 1967). It is situated 4km south of Nantwich and 9km southwest of Crewe. Two important north to south transport routes pass through the hamlet the Shropshire Union Canal, and the now dismantled railway line between Nantwich and Market Drayton. For a variety of reasons, determined by the local topography, the landscape in the vicinity of Hack Green has been used for a succession of defence related activities from the beginning of the Second World War. This sequence of defence land use may be traced through surviving field remains, aerial photography and cartographic sources.

RADAR STATION

Early second World War stop line and bombing decoy

Following the declaration of war in September 1939, and during the ensuing period of the 'Phoney War', many *ad hoc* measures were put in place to counter the perceived threat of German invasion. Railway lines or canals, as ready made obstacles in the landscape, were frequently used as defended stop lines - where it was intended to halt any advance if the country was invaded. Field evidence along the Shropshire Union Canal shows that it was intended to use it as a local stop line. For in the roadways of many of the bridges are set ceramic pipes, into which stout timbers or steel girders could quickly be inserted to block the bridge. Close to Hack Green four ceramic pipes 30cm (12 ins) in diameter remain set into Austin's Bridge (SJ 6480 4652).

Later farmland to the east of Hack Green was used as bombing decoy for the important railway centre at Crewe. Hack Green was chosen as it was sparsely populated and the presence of a north to south railway line allowed the position of Crewe to be plausibly mimicked. Such was the strategic importance of Crewe, that it was protected by a type of permanent bombing decoy known as a 'Starfish'. These were the most sophisticated type of decoys and employed a variety of effects to simulate a target under attack. The decoy was centred at SJ 663 473, a low lying site in the valley of the River Weaver. Characteristically of these sites the control shelter was located away from the decoy on the northern side of the track leading from Austerston Hall, at approximately SJ 6534 4746 (pers. comm. B Lowry). The earliest mention of the site was on 1 August 1941 and the latest reference was on 8 April 1943 (Dobinson, 1996, 143, 148).

Ground Controlled Interception Radar Station

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 designed primarily to look out to sea for incoming intruders, and although CHL stations could scan through 360 degrees they lacked accurate height finding equipment. The weakness of the system was particularly acute in the detection of hostile aircraft at night. In late 1940 it was suggested that to augment the coastal system a further series of radar installations known as Ground Control Interceptor (GCI) stations should be developed. The first of these stations became operational in early 1941. In use, the GCI stations were notified by the coastal stations of the course of the intruder, the GCI station then took over tracking the intruder. In operation they worked in concert with the local fighter sector to vector the interceptor onto its target (Latham and Stobbs 1996, 60-69). When the interceptor was close enough it could then use its airborne radar to close on the intruder.

Probably in early 1941, Hack Green was chosen as the site for a GCI station. One of the considerations in the siting of a GCI was its requirements for height finding. Height finding was achieved by ground reflections, it was therefore best if the GCI stations were placed at the centre of a shallow saucer shaped depressions of land (Latham and Stobbs 1996, 62). This criterion was met by Hack Green, which was placed at 53m above OD

on the Cheshire plain, roughly equidistant between the Welsh foothills to the west and the Pennines to the east. With a maximum range of around 80km (50 miles) it was ideally placed to cover the low lying corridor of land between Birmingham and Liverpool.

So great was the need to institute the GCI stations that many were initially established as mobile caravans, consisting of a transmitter vehicle, a receiver vehicle, and associated radar arrays. This mobile station may have been placed to the south of New Farm, where there are unexplained cropmarks of either a wireless aerial or the bases of radar gantries secured by guy wires, centred at SJ 6450 4817 (RAF CPE.UK 1935 Frame 1465, RAF 541/557 Frames 3034, 3036).

In the next phase, Intermediate GCI stations, the mobile operation caravans were replaced by wooden hutting. This site at Hack Green may clearly be identified on air photographs immediately to the west of New Farm. A crop mark visible in the late 1940s shows that it was a standard GCI intermediate station comprising, an Air Ministry Experimental Station (AMES) 8 C radar array mounted on a 'goalpost' type gantry supported on two wooden towers. Along side was the operations room, probably a timber hut and next to it were two smaller brick building, one of which probably housed a stand-by generator (RAF CPE.UK 1459 Frames 4085, 4120; CPE.UK 1935 Frame 1465; OS SJ 64/74 Frame 125, Lowry 1995, fig 18a). This may have been replaced by an operations room represented by a single-storey brick building with a pitched corrugated asbestos roof at SJ 6441 4823, which survives as an outbuilding in the yard of New Farm. In its eastern gable end are two doors, one of which is blocked. On its northern elevation is a single door and five eight light windows. On the southern elevation is a single door and six windows. All the windows are set in metal Crittal type frames. Originally there were two smaller buildings at the northern end of the surviving structure. These were demolished between 1947 and 1950 when the farmhouse of New Farm was constructed (RAF CPE UK 1935 Frame 1464, 1465; RAF 541/557 Frame 3036).

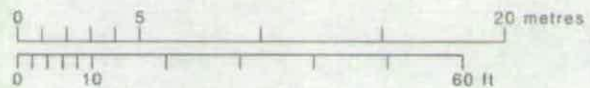
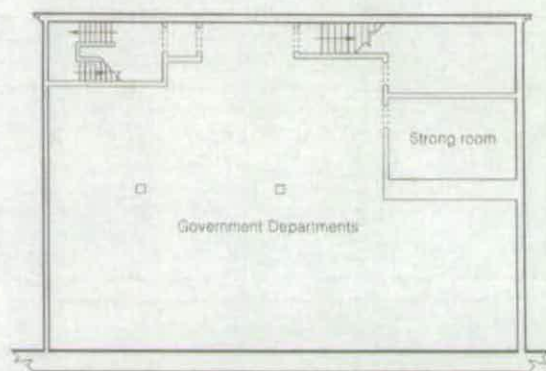
In the final phase of the wartime development of the GCI sites, the temporary control buildings were replaced by larger operations blocks known as 'Happidromes'. At Hack Green this was built in a compound 250m to the north-east of the original building opposite to Hack Green Cottages. A curved asbestos hut in their yard suggests they were perhaps also requisitioned. In addition to the 'Happidrome' the compound contained a guard room, stand-by set house, water tank, and sewage plant. This complex has been demolished, and its site was covered by silage at the time of survey. Hack Green was one of 21 fixed 'Happidromes' constructed, but was one of only 12 fully equipped with searchlight control and fighter control. The 'Happidrome' was probably operational by 1943 (Bullers 1991, 14). In common with the other static GCI stations Hack Green was equipped with an AMES Type 7 radar to track the plan position of aircraft. The Type 7 radar comprised a rotating aerial array mounted on a small brick plinths. The station was also equipped with Type 13 height finding radars, these comprised vertically mounted heads or cheeses which nodded up and down.

Air photographs taken during the late 1940s indicate that the station was stood down at the end of the war and the radar arrays and most of the associated wireless aerials were dismantled. This set of photographs and a contemporary model of the station, held at RAF Neatishead, allow the features of the final phase of the wartime station to be distinguished. The positions of four plinths may be recognised and the line feeds to

REGIONAL GOVERNMENT HEADQUARTERS 10.2 HACK GREEN
HACK GREEN, BADDINGTON, CHESHIRE

NGR: SJ 645 479 NBR No: 96044

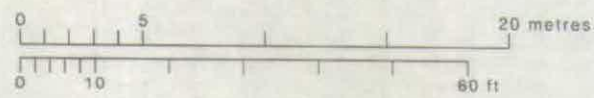
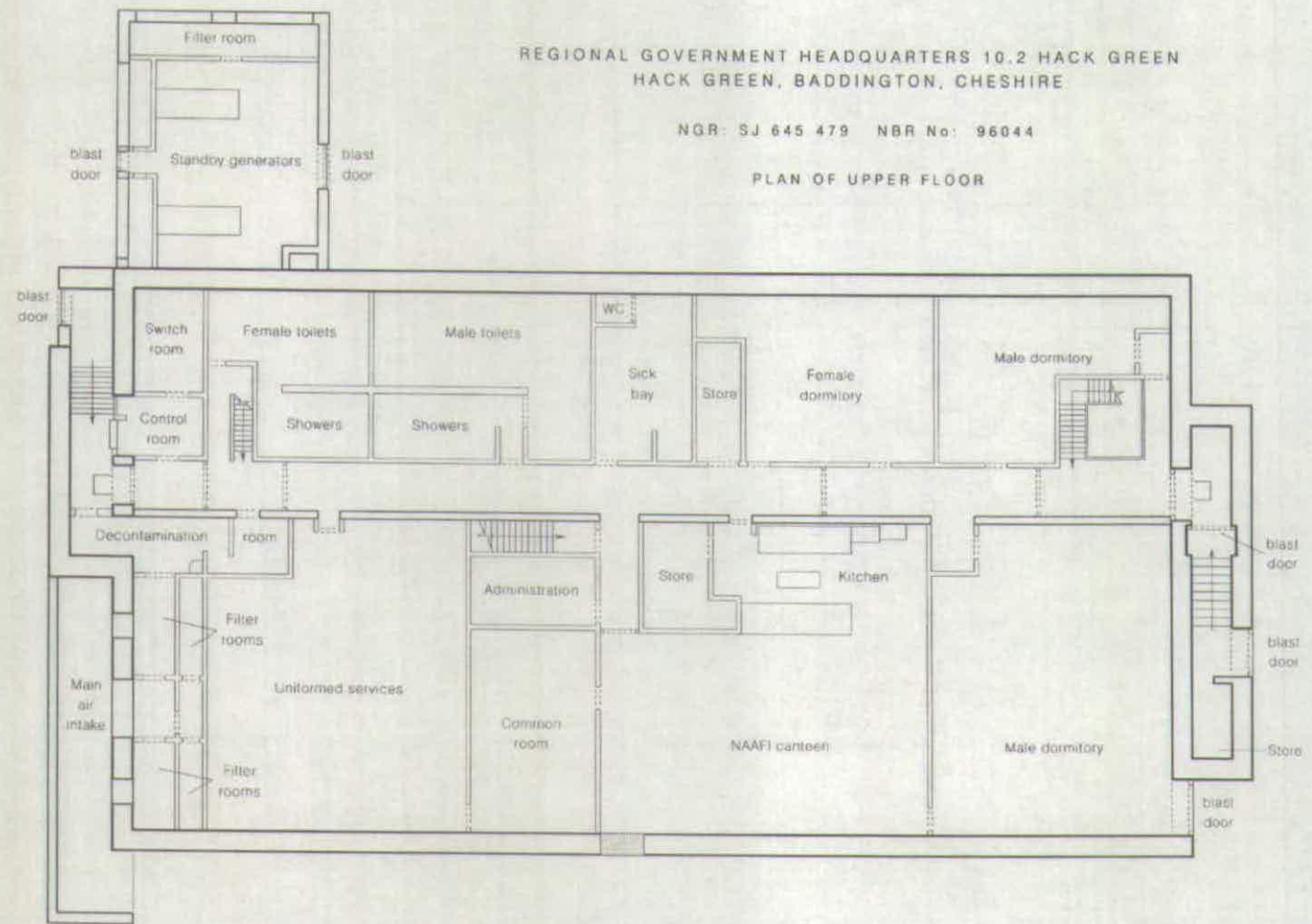
PLAN OF MEZZANINE FLOOR



REGIONAL GOVERNMENT HEADQUARTERS 10.2 HACK GREEN
HACK GREEN, BADDINGTON, CHESHIRE

NQR: SJ 645 479 NBR No: 96044

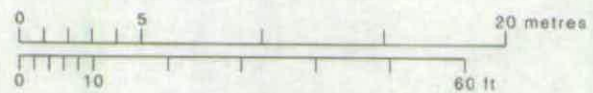
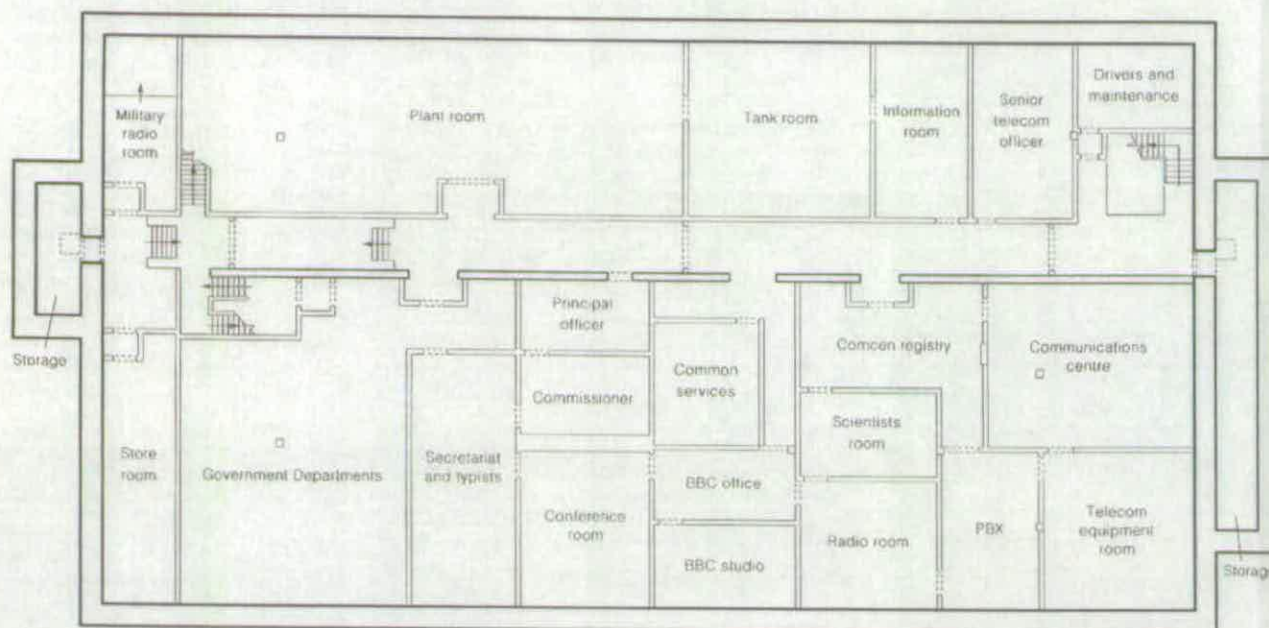
PLAN OF UPPER FLOOR

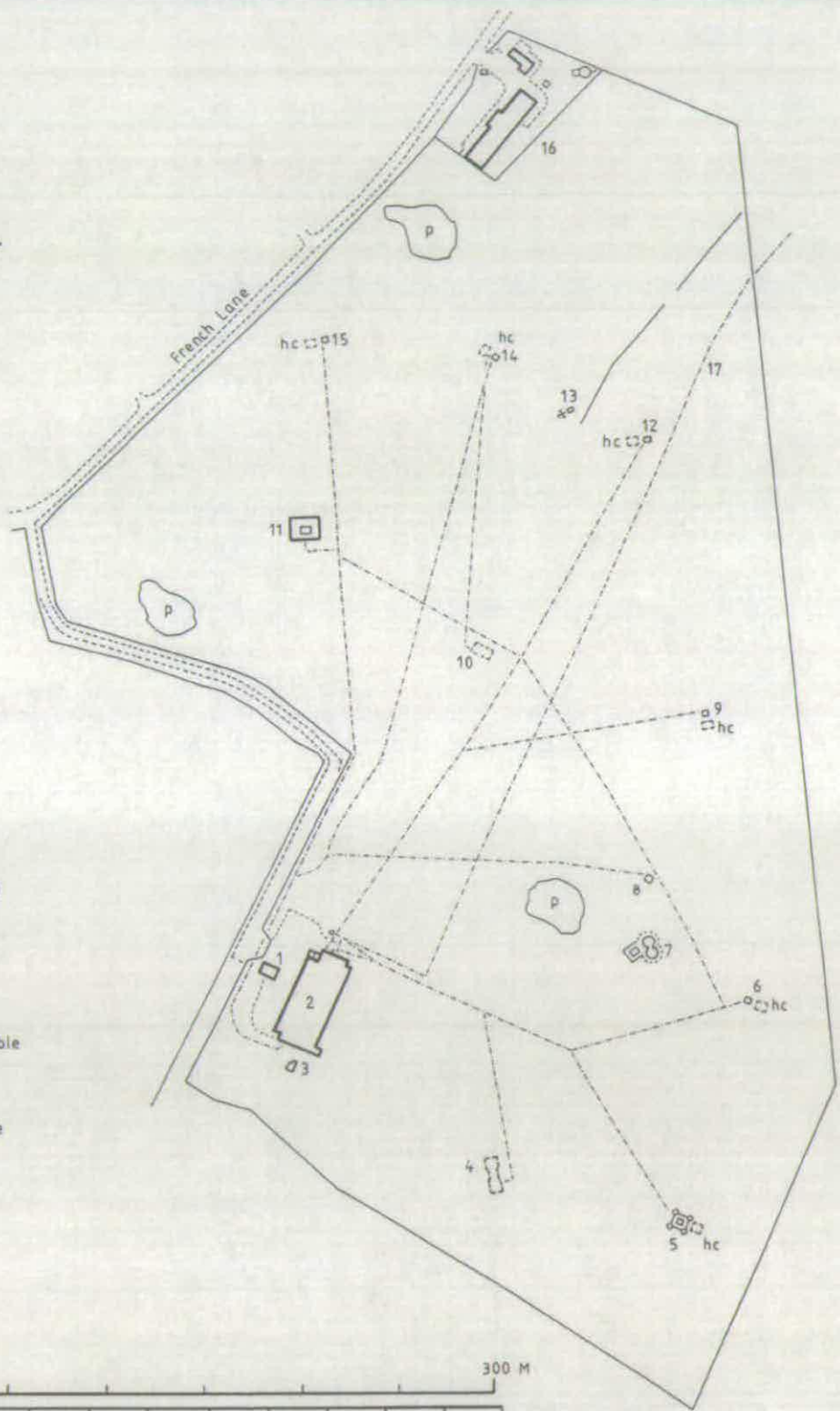


REGIONAL GOVERNMENT HEADQUARTERS 10.2 HACK GREEN
HACK GREEN, BADDINGTON, CHESHIRE

PLAN OF LOWER FLOOR

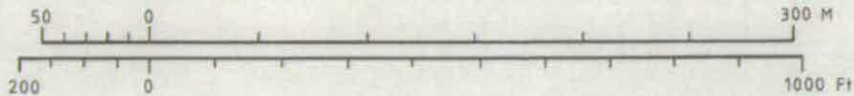
NGR: SJ 645 479 NBR No: 96044





1. Guardroom
2. R6 Operations block
3. Sub-station
4. Structure (not built)
5. Type 14 radar
6. Type 13 radar
7. Sewage plant
8. ?Type 14 radar
9. Type 13 radar
10. Type 11 radar hardstanding
11. Type 7 radar
12. Type 13 radar
13. Aerial base (IFF)
14. Type 13 radar
15. Type 13 radar
16. 'Happidrome'
17. Buried stand-by power cable

hc hardstanding for crane
--- cable duct
p pond



ROTOR PERIOD RADAR STATION (c.1953)

HACK GREEN, BADDINGTON, CHESHIRE

NGR: SJ 645 479

NBR No: 96044

Drawn scale: 1:2500

Drawn by A.T.Adams

Air Defence Battle Command and Control Museum

Neat/1997/169 Headquarters Fighter Command 1956 *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*

Topographic model of RAF Hack Green *circa* 1945 scale 1:1000 (on loan to Hack Green museum)

Secondary sources

BGS, 1967. British Geological Survey, Nantwich Sheet 122 Drift Edition.

Bullers, R. F. 1991. *Royal Air Force Neatishead 50 years on 'We guard the skies'* Tri-Service Magazines Kettering

Dobinson, C. S. 1996. *Twentieth century fortifications in England 3: Bombing decoys of WWII*. CBA/English Heritage. Unpublished report.

Gough, J. 1993. *Watching the Skies A history of ground radar for the air defence of the United Kingdom by the RAF from 1946-1975* HMSO London

Hartcup, G. 1993. *The silent revolution - Development of conventional weapons 1945-85* Brassey's

Ordnance Survey 1963. 1:2500 Plans SJ 63 47, 64 47, 64 48, 65 48, 65 49

Latham, C. and Stobbs, A. 1996. *Radar a wartime miracle* Alan Sutton Publishing Ltd

Lowry, B. (ed) 1995. *20th Century defences in Britain* CBA

Rainford, R. W. B. 1962. 'The 'Blip' Squad' *Cheshire Life* May 50-1

Wood, D. 1992. *Attack Warning Red* Carmichael and Sweet

SOURCES

Primary

Public Record Office

AIR29/2921 17 SU Hack Green Jan 56-Aug 57

PSA Photographs held by NMR

P/G 28028 CH Crown Building Hack Green Nantwich 13 11 1984, Colour 117 negatives

Air photographs consulted, held by NMR

OS/59/102.613 Frames 070, 071, 073, 09 Sep 1959.

OS SJ 64/74 19 June 1978 Madeley, Frame 125.

RAF 106G/UK 1459 Frames 4085, 4120, 02 May 1946.

RAF CPE/UK 1935 Frames 1464, 1465-6 17 Jan 1947.

RAF CPE/UK2499 Frames 4023-5, 12 Mar 1948.

RAF 541/557 Frames 3034, 3036, 05 Jun 1950.

RAF 540 RAF 992 Frame 0272, 20 Jan 1953.

RAF 540 RAF 1122, Frames 0178, 0179, 02 May 1953

RAF 58 RAF 1288 Frames 0069, 0082, 0083, 09 Oct 1953.

Drawings consulted on site

Site HAK Site plan for structure R6 c 1953 Scale 1.500

AD/75034/6 Hack Green Crown Building Cheshire Adaptations 6/4/1979

BW/75034/15 Hack Green Crown Building Diesel Generator Plant Room builders work details MPBW Aug 81

XB/75034/1 Hack Green Crown Building May 1976 New works to be added

XB/75034/2 Hack Green Crown Building May 1976

side of the Commissioner's Room was the Principal Officer's Room and a Conference Room. To the north of the Commissioner's Room were rooms to occupied by Common Services, a BBC office and studio and Scientists' Room. In the north-eastern corner of the bunker were located the main communications functions, including the ComCen (Communications Centre) Registry, a Radio Room, PMBX room, Communications Centre and in the corner of the bunker the British Telecom Equipment Room. Entry into this most sensitive area of the RGHQ was restricted by security desks placed at the entrances to the ComCen Registry and the Government Department's Room. Along the northern side of the bunker beneath the entrance passage is another storage area. The structure is in good condition. At present it houses a collection of Cold War artefacts and a number of rooms have been restored to their appearance during the 1980s.

Site Archive

A number of plans dating to the late 1970s, relating to the conversion of the R6 structure into a RGHQ and other miscellaneous material is held on site. A large collection of PSA photographs taken soon after the RGHQ was completed is held by the NMR.

The Air Defence Battle Command and Control Museum, RAF Neatishead, Norfolk has a model depicting RAF Hack Green at the end of the Second World War. It also holds secondary material on the history of radar, some which refers to Hack Green. The unit history of No.17 Signals Unit is held at the Public Record Office (AIR 29/2921).

ACKNOWLEDGEMENT

We are grateful to Mr R Siebert for allowing access to the RGHQ and to Mr B Lowry (local Defence of Britain co-ordinator) for sharing his knowledge on the sites around Hack Green. The report is the result of a field investigation carried out by Wayne Cocroft and Roger Thomas on 16 June 1997. Roger Thomas also took the 35mm record photographs.

banks of ceramic air filters. Access from the filter rooms into the main bunker is through an airlock which leads into the Decontamination Room. This is equipped with a shower and a bin for the disposal of contaminated items. A single door also opens into this room from the main entrance, described above, and a single door opens into it from the main axial corridor beyond the Control Room.

At the Control Room the passageway turns right into the main axial corridor. This is set off centre and runs the length of the bunker. At the end of the corridor are three sets of double doors which may be used to segregate movement within this area. In keeping with the original configuration of the bunker a passage way leads to the Female Toilets and Showers. Adjacent to this is a single flight of stairs which leads down to the basement. Returning to the main corridor at the top of the stairs are a pair of double swing doors. Beyond these opening off the western side of the corridor are the Male Toilets and Showers, Sick Bay, Store, Female Dormitories and Male dormitories.

Ranged along the eastern side of the main corridor are the Uniformed Services Room, Common Room, Administration Room, the Kitchen, Store and Canteen, and another Male Dormitory in the north-east corner of the bunker. In the early 1990s a double blast door was inserted into the northern wall of this room to allow it be used as workshop. One of the most substantial alterations to the R6 was the insertion of a mezzanine level. this is accessed by a flight of stairs adjacent to the Administration Room. This floor houses a Strong Room, a Store Room and a large room of unspecified function. A staircase at the southern end of this room leads down to the Government Department's room.

At the northern end of the bunker was another entrance, this is entered through a steel blast door described above. In a corresponding arrangement to the main entrance access to the upper floor of the bunker was by a flight of concrete stairs. It was also through this entrance that most of the plant was installed into the bunker. To lift heavy loads a steel lifting beam is secured to the roof. At the head of these stairs is the only remaining 1950s blast door, with a bottom hinged window light above. Beyond this door a double swing door opens into the main axial corridor. At this end of the corridor is a stair well with a central shaft with a lifting beam above, to enable plant to be lowered to the basement.

The basement is laid out to a similar plan form to the upper floor with a long axial corridor placed directly below the upper corridor, thereby dividing the basement into two uneven portions. In the northwest corner of the bunker behind the stairwell is a small self-contained room to accommodate the drivers and maintenance men. Working southwards along the corridor doors lead off into the Senior Telecom Officer's room, the Information Room and double doors into the Plant Room from which access may be gained into the Tank Room. This houses a large Braithwaite tank to hold the bunker's water supply. At the end of the corridor a small flight of steps leads down to the Military Communications Room in the southwest corner of the bunker and two store rooms.

The most important rooms in the bunker were located along the eastern side of the bunker and were occupied by the regional commissioner and the services needed to support his role. The Regional Commissioner's Room was located at the centre of this complex. To the south was a large room occupied by representatives of selected government departments and adjacent to this a room for secretarial services. To either

(6ft 7 ins) high, on the interior are dampers to control the air supply and VOKES 'Supervee' 594mm (23 ins) square filters. On the southern wall are two similar blast plates which cover the exhaust ducts. Internally the room is divided into two. At the western end is the narrow Filter Room, which is entered through an internal steel door which gives access to the filters for maintenance. In the plant room to either side of the southern door are two diesel generators on steel skids. Another distinctive feature of this plant was the provision of an induction fan in the wall between the filter room and the generators. This was provided to draw in large volumes of air to cool the generators after a nuclear attack, where the external air temperature would be extremely high and therefore less effective for use in cooling. So great was the volume of air that could be inducted it would be impossible for a person to work within the generator room.

In the early 1990s an additional door was cut in north wall, which is described above.

Standing aside from eastern side of the bunker is a steel section radio mast.

Interior

During the late 1970s and early 1980s the bunker was extensively refurbished to allow it to meet its new role as a Regional Government Headquarters. Although the floor plans bear a superficial resemblance to a standard R6 floor plan most of the internal walls were built during the refurbishment. Partition walls built at this date are easily recognisable through the use of breeze block. The bunker was also completely re-roofed. In common with refurbishments carried out elsewhere at this date, the ceiling is covered with spray finish concrete, precluding a precise determination of the roof structure. The roof supports are positioned 2m (6 ft 6 ins) apart, and are 0.37m (1 ft 2.5 ins) wide and 0.47m (1 ft 6.5 ins) deep.

In its original configuration the bunker was approached from its south western corner up a flight of nine steps, 1.78m (5 ft 10 ins) high. During the refurbishment the cutaway corner was closed by the construction of the Generator Room, and the main entrance moved onto the southern elevation of the bunker. The steel blast door is 1.5m (5 ft) wide by 2.25m (7 ft 4 ins) tall, and in common with all those put in the 1970s and subsequently, is Swiss made. It opens outwards and has a rubber seal to enable positive pressure to be maintained within the bunker. Inside is a small lobby area at the foot of the original flight of stairs. At the head of the stairs a single door leads into the Decontamination Room, and to the left is the Control Room, with sliding glass screen to enable entry into the bunker to be monitored. Behind the Control Room is the electrical Switch Room.

The main air intake for the bunker used the original arrangement for the R6 bunker. This consisted of a raised projecting air intake on the eastern elevation of the bunker leading into an open passage way between the main southern bunker wall and a thinner outer wall. Below this at ground level is an opening in the southern elevation, the interior of which is sealed by a metal grill. During the refurbishment of the R6 a hole was knocked in the floor of the air-intake passage. This was done to create an alternative entry into the bunker when it was operating under fallout conditions. Entry into the bunker was through a steel door placed in the inner southern wall between two steel blast plates which protect the air intake filters. Behind the access door is a metal decking over the Heat Receiving Plant, to either side are filter rooms. These house

REGIONAL GOVERNMENT HEADQUARTERS 10.2

The R6 Structure

In the mid 1970s, the redundant R6 Structure was identified as a suitable location for the Regional Government Headquarters (RGHQ) for Home Defence Region 10.2. By this date the bunker had been derelict for almost a decade, refurbishment entailed virtual stripping and remodelling of the interior and relaying of the roof. This work was so extensive that few features from original structure remain. Contemporary drawings indicate that proposals to convert the bunker into a protected seat of government began as early as spring 1976. Air photographs, however, indicate that there no work had begun by 1978, for, the guard room at the entrance to the compound was still standing, as were the brick radar plinths or their foundations and associated structures in the adjacent field (OS SJ 64/74 Madeley, Frame 125). Conversion work probably did not start until 1980 and took around five years at a reputed cost of £22 million pounds. The RGHQ became operational in 1984, when the completed work was recorded by a PSA photographer (NMR P/G 28028). It was probably at this time that the guard room and radar plinths were demolished; the small electricity Sub-station was, however, kept.

The effects of the detonation of a nuclear weapon may broadly be categorised as blast, radiation, fire and an electromagnetic pulse. The RGHQ was designed to resist all these threats; bar a direct strike. Theoretically it was able to withstand an over pressure of 10kn/m². It was also able to resist acceleration forces of up to 80m/sec propagating through the ground as a pressure wave. Nuclear and thermal flash would also raise the outside temperature considerably. The protection afforded by the thick concrete walls meant that outside temperatures could rise to 300°C for 1½ hours, with the effect of raising the inside temperature by a mere 15°C. This could, however, be offset against the air conditioning system which could reduce the internal temperature by 4° degrees per hour. Impact from air blast and flying debris was another potential threat to the RGHQ. To counter this hazard the walls were designed to resist a 5kg steel ball, fired at 800m/sec without creating dangerous spalling on the inside. The doors could resist a 5kg steel ball fired at 20m/sec. The thick reinforced concrete walls would also be very effective in reducing the risk from radiation, which could be further lessened by the elaborate air filtration banks to diminish the hazard from radioactive dust entering the bunker.

The RGHQ retained the pre-existing approach track off French Lane. But a roughly rectangular compound, 110 by 59m was created around it, fenced by standard concrete posts with out-turned tops supporting three strands of barbed wire. Entry into the enclosure is through a pair of double gates.

Exterior

The most obvious external changes made to the structure in the late 1970s were the repositioning of the main entrance to the southern side and the addition of the Generator Room to the western elevation. The Generator Room abuts this wall, it projects 10.2m (33ft) from the building and is 9.2m wide (30ft). It is entered through a steel blast door on its southern side, and on the northern side a wider blast door was provided for the installation of the generators. On the western side are two steel blast plates which protect the air intake for the generators, behind the plates are metal mesh security screens. The louvred holes of the intakes are 3.305m (10ft 9ins) wide x 2.015m

was £182,000 (NEAT/1997/169, Appendix R).

In addition to the personnel accommodated at Hack Green, many of the female assistant controllers were drawn from the local area, in particular Crewe, Nantwich, and the surrounding villages. Under the 'Local Service Scheme' all the women were full members of the Women's Royal Air Force (WRAF), but their conditions of service allowed them to live at home and not to be posted from the area without their consent (Rainford 1962, 51).

two small single storey brick buildings with flat concrete roofs. The smaller of the two buildings has double doors on its southern side. The other building is lit by at least one pair of windows on its southern elevation, the remainder of the wall was obscured by a manure heap. These may be interpreted as a stand-by set house and wireless block, air photographs show two radio masts (RAF 540/992 Frame 0272; RAF CPE UK 1935 Frame 1464, 58 RAF 1288, Frames 0082, 0083; OS/59/102.613 Frame 070).

Domestic sites and housing

The radar station was located in a relatively sparsely populated rural area with little potential accommodation for the personnel required by the radar station. The development of the domestic site and associated housing may be understood by reference to sequences of historic aerial photographs. A domestic site to accommodate the workers engaged in the construction of the R6 bunker was established on the eastern side of Coole Lane at SJ 654 496. Sequences of aerial photographs show that in January 1953 the site was an open field, by May the first roads had been laid and by October the camp comprised around thirty-five structures, a mixture of temporary Nissen type huts and a smaller number of brick buildings (540 RAF 992, Frame 0272, 540 RAF 1122, Frame 0179, 58 RAF 1288, Frame 0069). At the end of the decade the number of buildings had increased to around sixty (OS/59/102.613 Frame 073). By the late 1970s most of the domestic site had been cleared, but its plan may still be traced by overgrown roads and floor slabs (OS SJ 64/74 Madeley, Frame 141).

In addition, a small housing estate (SJ 64 NE 17) was constructed against the Coole Lane, to house some of the personnel stationed at the bunker, the estate was complete by December 1956 (AIR 29/2921 December 1956, 4). In common with other service estates the standard of housing was allocated according to rank. At the southern end of the estate are two detached officer's houses which front directly onto the lane. The remainder of the estate is screened by a road side hedge. Access into the estate is from a turning, which originally led to the domestic site, along its northern side is a terrace of four houses. Immediately after the turning in from the lane, a minor estate road turns southwards and on this road are sited two semi-detached houses. The remainder of the housing is arranged around a cul-de-sac and comprises two opposing blocks of four houses terraces, two opposed single occupancy houses and closing the cul-de-sac is a semi-detached house, perhaps created from a hostel block. The housing is now privately owned and is in good condition.

Closer to the bunker at French Lane End, the junction of Coole Lane with French Lane (SJ 6533 4845), three pairs of semi-detached houses with hipped roofs were built. The new houses were built on the northern side of the junction opposite a pair of pre-existing semi-detached houses (SJ 64 NE 16). Aerial photographs indicate that the houses were built between May and October 1953 (540 RAF 1122, Frame 0179, 58 RAF 1288, Frame 0069). Between the main domestic and the houses at French Lane End in the garden of Coole Lane Cottage (SJ 6542 4890) is a double length Tarran type prefabricated bungalow. It is not known if this was associated with the site.

In total, accommodation was available for 15 officers, 18 senior non-commissioned officers, and 160 corporals and aircraftmen. Communal mess facilities at the station were able to cater for 30 officers, 30 senior non-commissioned officers, and 350 corporals and aircraftmen. The total cost of the domestic accommodation at the station

technical side to the south-west and a domestic side to the north-east. The remaining equipment in the 'Happidrome' was removed in January 1956 when a party arrived from R.E.U. Henlow (AIR 29/2921 January 1956, 20), the empty shell remained standing until it was demolished in 1962.

Radar arrays

The radar arrays were positioned between the R6 and the 'Happidrome' and the railway line to the east. Hack Green was designated a GCI/A site and had full control facilities. In the initial phase the standard equipment for a GCI/A sites were nine radars comprising one Type 7 Mk2, one Type 14 Mk8, one Type 14 Mk9, two Type 13 Mk6, two Type 13 Mk7 and one Type 11(M) Mk7. The sites of nine radars are shown on a contemporary plan; the radar types have been indicated on the accompanying diagram. Hack Green appeared to conform this general plan except that only one Type 7 radar may be identified. In December 1956 it was reported that a Type 14 Mk8 (I Head) was being used in place of the Type 7, a Type 13 Mk7 (D Head) and a Type 14 Mk9 (H Head) were also in operation (AIR 29/2921 December 1956, 2).

The radar arrays were generally mounted on a small brick plinths which contained the electric motors to turn the arrays. Adjacent to most of the plinths was an area of hard standing on which a crane could be placed for routine maintenance of the equipment. One puzzling feature of the 1953 site plan is the indication of a building to the southeast of the R6. In plan form it is almost identical to that of a Type 80 radar modulator building. The prototype of the Type 80 radar had first been tested in October 1951, and orders for 12 more were placed at the end of that year (Hartcup 1993, 228). The depiction of this building might imply that there was the intention to install a Type 80 at Hack Green. Later air photographs and plans show no trace of this structure, which suggests it was never built. Nor does any available documentary evidence suggest that a Type 80 was installed at Hack Green. Also placed in this field was a wireless/radio aerial base. As noted above a unique Marconi Type 264 A/H radar was installed in 1962 as part of Hack Green's new air traffic control commitments, this comprised the middle array of the Type 82 and the upper array of the Type 84. It was probably mounted over a single-storey rectangular building which formerly stood near to the sharp angle in the lane to the R6 at SJ 6459 4802.

Wireless Stations

To the north, the two wartime radio stations were reoccupied. The most northerly station against Coole Lane, appears to have been little altered from its wartime form consisting of a single wireless room and mast. The other wireless station, close to Ashtree Farm was, however, extensively rebuilt. Work on remodelling station began in early 1953. It was placed in a fenced enclosure 90m (98 yards) square. The station comprised a long wireless room, a stand-by set house and three masts (RAF 540/1122 Frame 0178).

Also associated with the Rotor phase is a small wireless station (SJ 64 NE 15) south east of the R6. It lies in a small enclosure to the east of Old Hall farm on the north side of Brine Pits Lane at SJ 6543 4690. This is fenced with tall concrete posts and is entered through a single gate off a farm track to the south. Within the enclosure are

ins) with a projection 2.75m (9 ft) wide x 18.5m (52 ft) on its north side. The main external walls are 0.60m (2 ft) thick. They are largely featureless, and are in self finish concrete on which the marks left by timber shuttering is visible.

On the western elevation, the most prominent feature is the projecting Stand-by Generator Room, which was added during the 1970s refurbishment. This is described in more detail below. The remainder of the western wall is blank except for a number of blocked circular holes at ground level where cabling associated with the radar originally entered the structure. On the north elevation of the bunker is a 2.75m (9 ft) projection, the full height of the structure which houses the rear entrance. The original entrance into the structure was through a 6 foot (1.83m) wide by 7 foot 8 inch (2.33m) high, outward opening blast door. In the early 1990s a concrete access ramp was wrapped around the northeast corner of the structure leading to a pair of double blast doors, 2.7m (9 ft) square, which were cut into the north wall between the projection and the corner.

Slight scarring on the eastern elevation indicates the position of a projection on this side of the R6, shown on the 1963 Ordnance Survey plan, which also shows a path terminating at the projection. This is a modification to the original structure, but was in place by 1959 (OS/59/102.613 Frames 070, 071, 073).

The southern elevation is also largely featureless except at its southern end where there is an air intake vent raised 2.44m (8 ft) above the ground. The most prominent feature of the southern elevation is the 10.51m (34 ft 6 ins) long air intake at ground level. This is shielded by a thin suspended wall 0.46m (1 ft 6 ins) thick internally the air intake shaft is 1.47m (4 ft 10 ins) wide. The original southwestern corner of the bunker was refurbished during the late 1970s, and the main entrance into the structure moved round to the southern side.

Sub-station

Immediately to the south of the R 6 Structure is a small electricity Sub-station. It is rectangular in plan, it is brick built laid to English bond and is roofed by a flat concrete slab, it measures 6.4m by 3.77m (21 ft by 21 ft 4 ins). Traces of green camouflage paint are evident on its walls. It is contemporary in date with the R6 Structure.

Sewage plant

To the east of the R6, between it and the railway, was a small sewage plant (SJ 6469 4790) consisting of a small tool house and two circular beds. These structures have been removed.

The 'Happidrome'

The 'Happidrome' site was retained in a small compound enclosed by a post and wire fence. A contemporary plan indicates that there was a small guardroom adjacent to the gate, to its east was a stand-by set house, and in the eastern corner was a sewage plant and water tower. A contemporary plan shows the main building split into two parts, a

244 corporals and aircraftsmen (NEAT/1997/169, Appendix R). During this period Hack Green was staffed by No.17 Signals Unit.

The Rotor scheme was, however, 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 to update the United Kingdom's radar defences known as the '1958' plan, Hack Green was no longer required. Hack Green's GCI role ended in 1958, and the last entry was made in No.17 Signals Unit history in August when the station was put on a care and maintenance regime (AIR 29/2921, August 1957,3). The '1958' plan emerged in 1959 as a system called Plan Ahead, which in addition to providing early warning was also able to co-ordinate Lightning interceptor aircraft and Bloodhound surface to air missiles. 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 (Hartcup 1993, 31).

Hack Green's operational life was, however, extended when it was incorporated in the United Kingdom Air Traffic System (UKATS). By March 1959 it had been arranged to use the GCI radars at Hack Green to provide a radar assisted crossing service for military and civil aircraft using the busiest airways (Rainford 1962, 50-1; Gough 1993, 213). The station was redesignated an Air Traffic Control Radar Unit (ATCRU) and was staffed by military and civil controllers. Initially the scheme was able to assist aircraft flying up to 25,000 feet, but by the early 1960s was extended into the 'upper air space', over 25,000 feet. Alterations to the station around this time included the demolition of the wartime 'Happidrome' and its compound in 1962 also in 1962 a unique Marconi 264 A/H radar was installed which became operational in spring 1963. But under a new programme in the early 1960s to elaborate the air traffic system Hack Green's responsibilities were split between North Luffenham, Midland Radar and Lindholme, South Yorkshire (NBR 95649), North Radar and the station at Hack Green were closed in September 1966 (Gough 1993, 275). Between the mid 1960s and the late 1970s the R6 was left empty. The radar arrays were taken down about 1968, but the plinths, or their foundations, remained in place until at least the late 1970s (OS SJ 64/74 Madeley, Frame 125).

The R6 structure

The R6 structure was constructed on a new site in open pasture 0.5km south of the wartime 'Happidrome'. It is a standard Air Ministry Type R6 structure built in the early 1950s to house the monitoring consoles and communications equipment associated with the Rotor radar network. A new access road was laid to the structure off French Lane immediately to the east of Hack Houses.

Outwardly the R6 structure is little altered from its appearance in the 1950s. The description of the exterior of the structure will therefore be presented here, and a description of the modified interior below. The R6 is a heavily protected, semi-sunken reinforced concrete structure which is rectangular in plan. It is oriented north-north-west to south-south-east. The main section measures 50.6m (166 ft) x 31.28m (81 ft 11

them from the 'Happidrome' showing as crop marks. The radar arrays may be classified as a Type 14, search radar, west of the 'Happidrome', a Type 7, plan position radar, close to the original GCI site, and two smaller features north and south of the 'Happidrome' mark the position of Type 13, height finding radars. In its final phase the site was also provided with two buildings on the site of New Farm, one of which, as has been suggested above, may still survive. Across the lane in a small enclosure were two small huts, which, may perhaps be identified as the domestic site for the radar station (RAF CPE.UK 1459 Frame 4085).

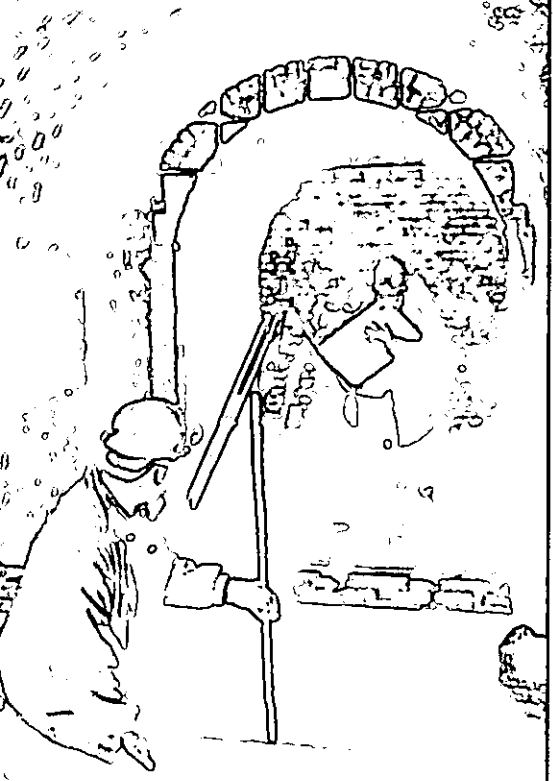
The radar station was served by a wireless station about 1.6km (1 mile) to the northeast. The wireless station was split into two parts - a transmitting station and a receiving station. Although two sites have been found, it is not possible to differentiate between the two. The more northerly site lies in a small fenced enclosure, on the western side of Coole Lane at SJ 6517 4972. Air photographs show at least two small buildings in the enclosure, which may be identified as a picket post, a wireless block and an adjacent wireless mast. The area is heavily overgrown, the one building which is visible from the road, is a single-storey, cement rendered building with a pitched corrugated asbestos roof. Its partner lay about 0.8km (½ mile) to the southeast at SJ 6585 4930 on the southern side of track leading to Ashtree Farm. This station consisted of a picket post, transformer house and wireless block (RAF 106G/UK 1459 Frame 4120).

Rotor period Radar Station

By the late 1940s it was clear the depleted wartime radar network was inadequate to cope with the threat posed by fast jet aircraft. Nor did the wartime structures the radar personnel were housed in provide 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 radar 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, eleven were housed in underground structures while the remaining fourteen were accommodated in semi-submerged structures. The new structures followed a variety of standardised patterns.

Hack Green is a type R6, a type which was also erected at four other locations. Air photographs show that construction work had commenced at Hack Green on the R6 and footings for the radar plinths by January 1953 (540 RAF 992 Frame 0272). By October the radar plinths had been installed, and linear scars across the field indicate the buried line-feeds had been laid connecting the radar heads to the bunker (58 RAF 1288 Frame 0083). This suggests the original programme was considerably behind schedule, as it had been envisaged that the technical building would be ready for the installation of equipment by the end of April 1952 and the work would be completed by the beginning of August. The main contractors for the work at Hack Green were Humphreys, who were responsible for the erection of five stations including Hack Green. The total cost of the technical facilities was £337,000. The operational establishment of the station by the mid-1950s was 18 officers, 26 senior non-commissioned officers, and

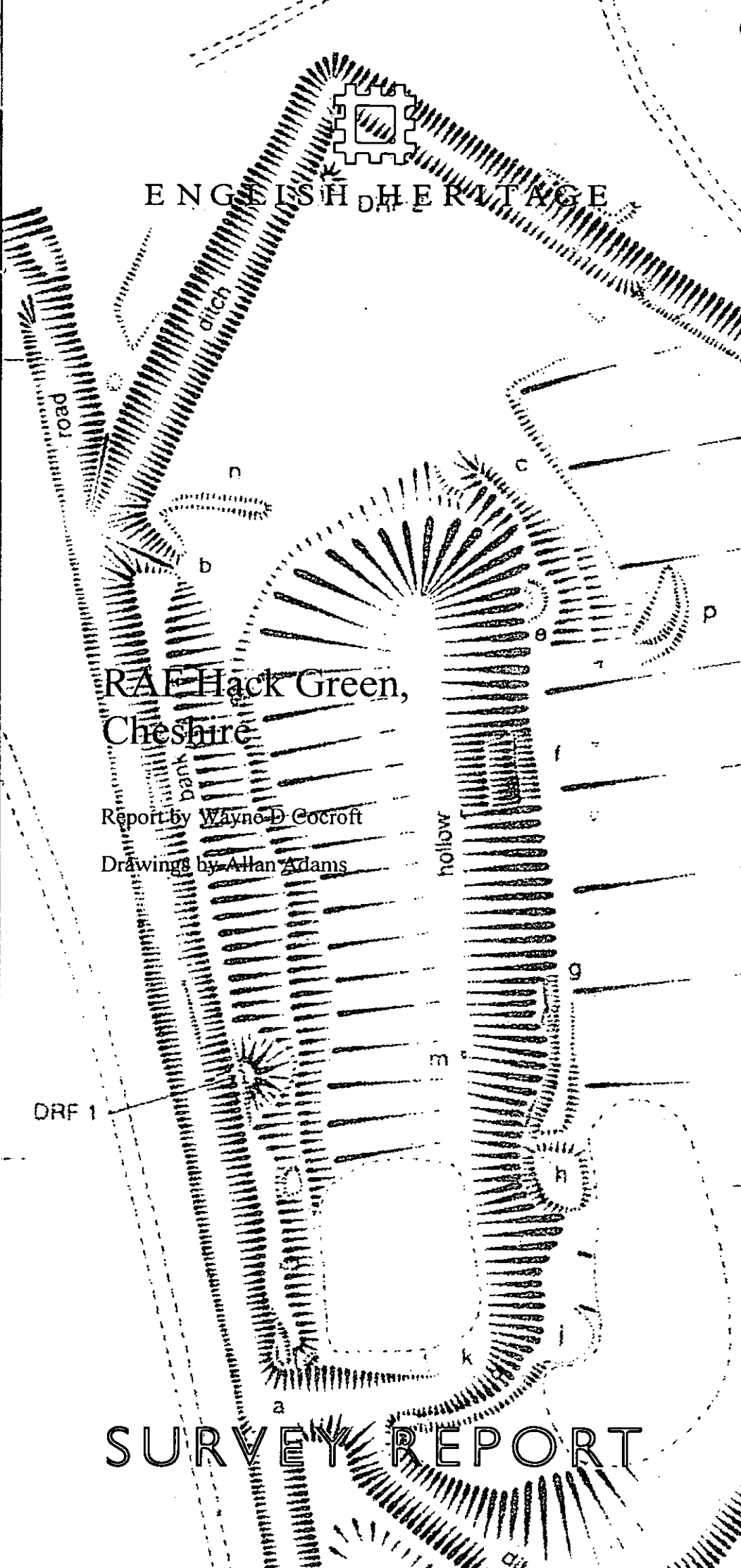


ENGLISH HERITAGE

RAF Hack Green,
Cheshire

Report by Wayne D Cocroft

Drawings by Allan Adams



SURVEY REPORT

RAF Hack Green, Cheshire

Report by Wayne D Cocroft

Drawings by Allan Adams

COLD WAR PROJECT

SURVEY REPORT

RGHQ 10.2

**Hack Green
Cheshire**

NBR No: 96044
NMR No: SJ 64 NW 15
NGR: SJ 645 479
Hob UID: 1086498

November 1998

Investigated by Wayne Cocroft and Roger Thomas
Report by Wayne Cocroft
Drawings by Allan Adams
Photography by Roger Thomas and Bob Skingle

© Crown copyright.RCHME

Cambridge office: RCHME, Brooklands, 24 Brooklands Avenue, Cambridge, CB2 2BU
Tel: 01223 324010 Fax: 01223 311203 e-mail: Cambridge@rchme.gov.uk

Headquarters: RCHME, National Monuments Record Centre, Kemble Drive, Swindon, Wiltshire, SN2 2GZ.
Tel: 01793 414600 Fax: 01793 414707 e-mail: info@rchme.gov.uk World Wide Web: <http://www.rchme.gov.uk>

CONTENTS

Summary	1
Introduction	2
Radar Station	3
Early Second World War stop line and bombing decoy	3
Ground Control Interception Radar Station	3
Rotor period Radar Station	5
R6 Structure	6
Sub-station	7
Sewage plant	7
The ‘Happidrome’	7
Radar arrays	8
Wireless stations	8
Domestic site and housing	9
Regional Government Headquarters 10.2	11
The R6 Structure	11
Exterior	11
Interior	12
Site archive	14
Acknowledgement	14
Sources	15
Primary	15
Public Record Office	15
PSA photographs, NMR Collection	16
Air photographs consulted, held by NMR	16

Drawings consulted on site	16
Air Defence Battle Command and Control Museum	16
Secondary	16

Figures

Site plan of Hack Green about 1953

RGHQ Plan of Lower Floor

RGHQ Plan of Upper Floor

Plan of Mezzanine floor

SUMMARY

Regional Government Headquarters (RGHQ) 10.2 Hack Green is a semi-sunken, heavily protected bunker. In the event of nuclear war, it was envisaged that the central government administration of the region would be conducted from this bunker. The headquarters reused an earlier R6 type bunker, constructed in early 1950s as part of the Rotor radar programme. Which itself re-occupied the site of a wartime radar station.

The RGHQ sits at the centre of a complex sequence of military land use, which has been adapted since the Second World War to match changing defence needs. This report will describe the features of this landscape and the final form of the R6 structure, after it was converted into a Regional Government Headquarters.

INTRODUCTION

Hack Green is a small dispersed rural hamlet, which lies in the southern part of the Cheshire Plain over pleistocene till deposits (BGS 1967). It is situated 4km south of Nantwich and 9km southwest of Crewe. Two important north to south transport routes pass through the hamlet the Shropshire Union Canal, and the now dismantled railway line between Nantwich and Market Drayton. For a variety of reasons, determined by the local topography, the landscape in the vicinity of Hack Green has been used for a succession of defence related activities from the beginning of the Second World War. This sequence of defence land use may be traced through surviving field remains, aerial photography and cartographic sources.

RADAR STATION

Early second World War stop line and bombing decoy

Following the declaration of war in September 1939, and during the ensuing period of the 'Phoney War', many *ad hoc* measures were put in place to counter the perceived threat of German invasion. Railway lines or canals, as ready made obstacles in the landscape, were frequently used as defended stop lines - where it was intended to halt any advance if the country was invaded. Field evidence along the Shropshire Union Canal shows that it was intended to use it as a local stop line. For in the roadways of many of the bridges are set ceramic pipes, into which stout timbers or steel girders could quickly be inserted to block the bridge. Close to Hack Green four ceramic pipes 30cm (12 ins) in diameter remain set into Austin's Bridge (SJ 6480 4652).

Later farmland to the east of Hack Green was used as bombing decoy for the important railway centre at Crewe. Hack Green was chosen as it was sparsely populated and the presence of a north to south railway line allowed the position of Crewe to be plausibly mimicked. Such was the strategic importance of Crewe, that it was protected by a type of permanent bombing decoy known as a 'Starfish'. These were the most sophisticated type of decoys and employed a variety of effects to simulate a target under attack. The decoy was centred at SJ 663 473, a low lying site in the valley of the River Weaver. Characteristically of these sites the control shelter was located away from the decoy on the northern side of the track leading from Austerston Hall, at approximately SJ 6534 4746 (pers. comm. B Lowry). The earliest mention of the site was on 1 August 1941 and the latest reference was on 8 April 1943 (Dobinson, 1996, 143, 148).

Ground Controlled Interception Radar Station

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 designed primarily to look out to sea for incoming intruders, and although CHL stations could scan through 360 degrees they lacked accurate height finding equipment. The weakness of the system was particularly acute in the detection of hostile aircraft at night. In late 1940 it was suggested that to augment the coastal system a further series of radar installations known as Ground Control Interceptor (GCI) stations should be developed. The first of these stations became operational in early 1941. In use, the GCI stations were notified by the coastal stations of the course of the intruder, the GCI station then took over tracking the intruder. In operation they worked in concert with the local fighter sector to vector the interceptor onto its target (Latham and Stobbs 1996, 60-69). When the interceptor was close enough it could then use its airborne radar to close on the intruder.

Probably in early 1941, Hack Green was chosen as the site for a GCI station. One of the considerations in the siting of a GCI was its requirements for height finding. Height finding was achieved by ground reflections, it was therefore best if the GCI stations were placed at the centre of a shallow saucer shaped depressions of land (Latham and Stobbs 1996, 62). This criterion was met by Hack Green, which was placed at 53m above OD

on the Cheshire plain, roughly equidistant between the Welsh foothills to the west and the Pennines to the east. With a maximum range of around 80km (50 miles) it was ideally placed to cover the low lying corridor of land between Birmingham and Liverpool.

So great was the need to institute the GCI stations that many were initially established as mobile caravans, consisting of a transmitter vehicle, a receiver vehicle, and associated radar arrays. This mobile station may have been placed to the south of New Farm, where there are unexplained cropmarks of either a wireless aerial or the bases of radar gantries secured by guy wires, centred at SJ 6450 4817 (RAF CPE.UK 1935 Frame 1465, RAF 541/557 Frames 3034, 3036).

In the next phase, Intermediate GCI stations, the mobile operation caravans were replaced by wooden hutting. This site at Hack Green may clearly be identified on air photographs immediately to the west of New Farm. A crop mark visible in the late 1940s shows that it was a standard GCI intermediate station comprising, an Air Ministry Experimental Station (AMES) 8 C radar array mounted on a 'goalpost' type gantry supported on two wooden towers. Along side was the operations room, probably a timber hut and next to it were two smaller brick building, one of which probably housed a stand-by generator (RAF CPE.UK 1459 Frames 4085, 4120; CPE.UK 1935 Frame 1465; OS SJ 64/74 Frame 125, Lowry 1995, fig 18a). This may have been replaced by an operations room represented by a single-storey brick building with a pitched corrugated asbestos roof at SJ 6441 4823, which survives as an outbuilding in the yard of New Farm. In its eastern gable end are two doors, one of which is blocked. On its northern elevation is a single door and five eight light windows. On the southern elevation is a single door and six windows. All the windows are set in metal Crittal type frames. Originally there were two smaller buildings at the northern end of the surviving structure. These were demolished between 1947 and 1950 when the farmhouse of New Farm was constructed (RAF CPE UK 1935 Frame 1464, 1465; RAF 541/557 Frame 3036).

In the final phase of the wartime development of the GCI sites, the temporary control buildings were replaced by larger operations blocks known as 'Happidromes'. At Hack Green this was built in a compound 250m to the north-east of the original building opposite to Hack Green Cottages. A curved asbestos hut in their yard suggests they were perhaps also requisitioned. In addition to the 'Happidrome' the compound contained a guard room, stand-by set house, water tank, and sewage plant. This complex has been demolished, and its site was covered by silage at the time of survey. Hack Green was one of 21 fixed 'Happidromes' constructed, but was one of only 12 fully equipped with searchlight control and fighter control. The 'Happidrome' was probably operational by 1943 (Bullers 1991, 14). In common with the other static GCI stations Hack Green was equipped with an AMES Type 7 radar to track the plan position of aircraft. The Type 7 radar comprised a rotating aerial array mounted on a small brick plinths. The station was also equipped with Type 13 height finding radars, these comprised vertically mounted heads or cheeses which nodded up and down.

Air photographs taken during the late 1940s indicate that the station was stood down at the end of the war and the radar arrays and most of the associated wireless aerials were dismantled. This set of photographs and a contemporary model of the station, held at RAF Neatishead, allow the features of the final phase of the wartime station to be distinguished. The positions of four plinths may be recognised and the line feeds to

them from the 'Happidrome' showing as crop marks. The radar arrays may be classified as a Type 14, search radar, west of the 'Happidrome', a Type 7, plan position radar, close to the original GCI site, and two smaller features north and south of the 'Happidrome' mark the position of Type 13, height finding radars. In its final phase the site was also provided with two buildings on the site of New Farm, one of which, as has been suggested above, may still survive. Across the lane in a small enclosure were two small huts, which, may perhaps be identified as the domestic site for the radar station (RAF CPE.UK 1459 Frame 4085).

The radar station was served by a wireless station about 1.6km (1 mile) to the northeast. The wireless station was split into two parts - a transmitting station and a receiving station. Although two sites have been found, it is not possible to differentiate between the two. The more northerly site lies in a small fenced enclosure, on the western side of Coole Lane at SJ 6517 4972. Air photographs show at least two small buildings in the enclosure, which may be identified as a picket post, a wireless block and an adjacent wireless mast. The area is heavily overgrown, the one building which is visible from the road, is a single-storey, cement rendered building with a pitched corrugated asbestos roof. Its partner lay about 0.8km (½ mile) to the southeast at SJ 6585 4930 on the southern side of track leading to Ashtree Farm. This station consisted of a picket post, transformer house and wireless block (RAF 106G/UK 1459 Frame 4120).

Rotor period Radar Station

By the late 1940s it was clear the depleted wartime radar network was inadequate to cope with the threat posed by fast jet aircraft. Nor did the wartime structures the radar personnel were housed in provide 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 radar 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, eleven were housed in underground structures while the remaining fourteen were accommodated in semi-submerged structures. The new structures followed a variety of standardised patterns. Hack Green is a type R6, a type which was also erected at four other locations. Air photographs show that construction work had commenced at Hack Green on the R6 and footings for the radar plinths by January 1953 (540 RAF 992 Frame 0272). By October the radar plinths had been installed, and linear scars across the field indicate the buried line-feeds had been laid connecting the radar heads to the bunker (58 RAF 1288 Frame 0083). This suggests the original programme was considerably behind schedule, as it had been envisaged that the technical building would be ready for the installation of equipment by the end of April 1952 and the work would be completed by the beginning of August. The main contractors for the work at Hack Green were Humphreys, who were responsible for the erection of five stations including Hack Green. The total cost of the technical facilities was £337,000. The operational establishment of the station by the mid-1950s was 18 officers, 26 senior non-commissioned officers, and

244 corporals and aircraftsmen (NEAT/1997/169, Appendix R). During this period Hack Green was staffed by No.17 Signals Unit.

The Rotor scheme was, however, 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 to update the United Kingdom's radar defences known as the '1958' plan, Hack Green was no longer required. Hack Green's GCI role ended in 1958, and the last entry was made in No.17 Signals Unit history in August when the station was put on a care and maintenance regime (AIR 29/2921, August 1957,3). The '1958' plan emerged in 1959 as a system called Plan Ahead, which in addition to providing early warning was also able to co-ordinate Lightning interceptor aircraft and Bloodhound surface to air missiles. 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 (Hartcup 1993, 31).

Hack Green's operational life was, however, extended when it was incorporated in the United Kingdom Air Traffic System (UKATS). By March 1959 it had been arranged to use the GCI radars at Hack Green to provide a radar assisted crossing service for military and civil aircraft using the busiest airways (Rainford 1962, 50-1; Gough 1993, 213). The station was redesignated an Air Traffic Control Radar Unit (ATCRU) and was staffed by military and civil controllers. Initially the scheme was able to assist aircraft flying up to 25,000 feet, but by the early 1960s was extended into the 'upper air space', over 25,000 feet. Alterations to the station around this time included the demolition of the wartime 'Happidrome' and its compound in 1962 also in 1962 a unique Marconi 264 A/H radar was installed which became operational in spring 1963. But under a new programme in the early 1960s to elaborate the air traffic system Hack Green's responsibilities were split between North Luffenham, Midland Radar and Lindholme, South Yorkshire (NBR 95649), North Radar and the station at Hack Green were closed in September 1966 (Gough 1993, 275). Between the mid 1960s and the late 1970s the R6 was left empty. The radar arrays were taken down about 1968, but the plinths, or their foundations, remained in place until at least the late 1970s (OS SJ 64/74 Madeley, Frame 125).

The R6 structure

The R6 structure was constructed on a new site in open pasture 0.5km south of the wartime 'Happidrome'. It is a standard Air Ministry Type R6 structure built in the early 1950s to house the monitoring consoles and communications equipment associated with the Rotor radar network. A new access road was laid to the structure off French Lane immediately to the east of Hack Houses.

Outwardly the R6 structure is little altered from its appearance in the 1950s. The description of the exterior of the structure will therefore be presented here, and a description of the modified interior below. The R6 is a heavily protected, semi-sunken reinforced concrete structure which is rectangular in plan. It is oriented north-north-west to south-south-east. The main section measures 50.6m (166 ft) x 31.28m (81 ft 11

ins) with a projection 2.75m (9 ft) wide x 18.5m (52 ft) on its north side. The main external walls are 0.60m (2 ft) thick. They are largely featureless, and are in self finish concrete on which the marks left by timber shuttering is visible.

On the western elevation, the most prominent feature is the projecting Stand-by Generator Room, which was added during the 1970s refurbishment. This is described in more detail below. The remainder of the western wall is blank except for a number of blocked circular holes at ground level where cabling associated with the radar originally entered the structure. On the north elevation of the bunker is a 2.75m (9 ft) projection, the full height of the structure which houses the rear entrance. The original entrance into the structure was through a 6 foot (1.83m) wide by 7 foot 8 inch (2.33m) high, outward opening blast door. In the early 1990s a concrete access ramp was wrapped around the northeast corner of the structure leading to a pair of double blast doors, 2.7m (9 ft) square, which were cut into the north wall between the projection and the corner.

Slight scarring on the eastern elevation indicates the position of a projection on this side of the R6, shown on the 1963 Ordnance Survey plan, which also shows a path terminating at the projection. This is a modification to the original structure, but was in place by 1959 (OS/59/102.613 Frames 070, 071, 073).

The southern elevation is also largely featureless except at its southern end where there is an air intake vent raised 2.44m (8 ft) above the ground. The most prominent feature of the southern elevation is the 10.51m (34 ft 6 ins) long air intake at ground level. This is shielded by a thin suspended wall 0.46m (1 ft 6 ins) thick internally the air intake shaft is 1.47m (4 ft 10 ins) wide. The original southwestern corner of the bunker was refurbished during the late 1970s, and the main entrance into the structure moved round to the southern side.

Sub-station

Immediately to the south of the R 6 Structure is a small electricity Sub-station. It is rectangular in plan, it is brick built laid to English bond and is roofed by a flat concrete slab, it measures 6.4m by 3.77m (21 ft by 21 ft 4 ins). Traces of green camouflage paint are evident on its walls. It is contemporary in date with the R6 Structure.

Sewage plant

To the east of the R6, between it and the railway, was a small sewage plant (SJ 6469 4790) consisting of a small tool house and two circular beds. These structures have been removed.

The 'Happidrome'

The 'Happidrome' site was retained in a small compound enclosed by a post and wire fence. A contemporary plan indicates that there was a small guardroom adjacent to the gate, to its east was a stand-by set house, and in the eastern corner was a sewage plant and water tower. A contemporary plan shows the main building split into two parts, a

technical side to the south-west and a domestic side to the north-east. The remaining equipment in the 'Happidrome' was removed in January 1956 when a party arrived from R.E.U. Henlow (AIR 29/2921 January 1956, 20), the empty shell remained standing until it was demolished in 1962.

Radar arrays

The radar arrays were positioned between the R6 and the 'Happidrome' and the railway line to the east. Hack Green was designated a GCI/A site and had full control facilities. In the initial phase the standard equipment for a GCI/A sites were nine radars comprising one Type 7 Mk2, one Type 14 Mk8, one Type 14 Mk9, two Type 13 Mk6, two Type 13 Mk7 and one Type 11(M) Mk7. The sites of nine radars are shown on a contemporary plan; the radar types have been indicated on the accompanying diagram. Hack Green appeared to conform this general plan except that only one Type 7 radar may be identified. In December 1956 it was reported that a Type 14 Mk8 (I Head) was being used in place of the Type 7, a Type 13 Mk7 (D Head) and a Type 14 Mk9 (H Head) were also in operation (AIR 29/2921 December 1956, 2).

The radar arrays were generally mounted on a small brick plinths which contained the electric motors to turn the arrays. Adjacent to most of the plinths was an area of hard standing on which a crane could be placed for routine maintenance of the equipment. One puzzling feature of the 1953 site plan is the indication of a building to the southeast of the R6. In plan form it is almost identical to that of a Type 80 radar modulator building. The prototype of the Type 80 radar had first been tested in October 1951, and orders for 12 more were placed at the end of that year (Hartcup 1993, 228). The depiction of this building might imply that there was the intention to install a Type 80 at Hack Green. Later air photographs and plans show no trace of this structure, which suggests it was never built. Nor does any available documentary evidence suggest that a Type 80 was installed at Hack Green. Also placed in this field was a wireless/radio aerial base. As noted above a unique Marconi Type 264 A/H radar was installed in 1962 as part of Hack Green's new air traffic control commitments, this comprised the middle array of the Type 82 and the upper array of the Type 84. It was probably mounted over a single-storey rectangular building which formerly stood near to the sharp angle in the lane to the R6 at SJ 6459 4802.

Wireless Stations

To the north, the two wartime radio stations were reoccupied. The most northerly station against Coole Lane, appears to have been little altered from its wartime form consisting of a single wireless room and mast. The other wireless station, close to Ashtree Farm was, however, extensively rebuilt. Work on remodelling station began in early 1953. It was placed in a fenced enclosure 90m (98 yards) square. The station comprised a long wireless room, a stand-by set house and three masts (RAF 540/1122 Frame 0178).

Also associated with the Rotor phase is a small wireless station (SJ 64 NE 15) south east of the R6. It lies in a small enclosure to the east of Old Hall farm on the north side of Brine Pits Lane at SJ 6543 4690. This is fenced with tall concrete posts and is entered through a single gate off a farm track to the south. Within the enclosure are

two small single storey brick buildings with flat concrete roofs. The smaller of the two buildings has double doors on its southern side. The other building is lit by at least one pair of windows on its southern elevation, the remainder of the wall was obscured by a manure heap. These may be interpreted as a stand-by set house and wireless block, air photographs show two radio masts (RAF 540/992 Frame 0272; RAF CPE UK 1935 Frame 1464, 58 RAF 1288, Frames 0082, 0083; OS/59/102.613 Frame 070).

Domestic sites and housing

The radar station was located in a relatively sparsely populated rural area with little potential accommodation for the personnel required by the radar station. The development of the domestic site and associated housing may be understood by reference to sequences of historic aerial photographs. A domestic site to accommodate the workers engaged in the construction of the R6 bunker was established on the eastern side of Coole Lane at SJ 654 496. Sequences of aerial photographs show that in January 1953 the site was an open field, by May the first roads had been laid and by October the camp comprised around thirty-five structures, a mixture of temporary Nissen type huts and a smaller number of brick buildings (540 RAF 992, Frame 0272, 540 RAF 1122, Frame 0179, 58 RAF 1288, Frame 0069). At the end of the decade the number of buildings had increased to around sixty (OS/59/102.613 Frame 073). By the late 1970s most of the domestic site had been cleared, but its plan may still be traced by overgrown roads and floor slabs (OS SJ 64/74 Madeley, Frame 141).

In addition, a small housing estate (SJ 64 NE 17) was constructed against the Coole Lane, to house some of the personnel stationed at the bunker, the estate was complete by December 1956 (AIR 29/2921 December 1956, 4). In common with other service estates the standard of housing was allocated according to rank. At the southern end of the estate are two detached officer's houses which front directly onto the lane. The remainder of the estate is screened by a road side hedge. Access into the estate is from a turning, which originally led to the domestic site, along its northern side is a terrace of four houses. Immediately after the turning in from the lane, a minor estate road turns southwards and on this road are sited two semi-detached houses. The remainder of the housing is arranged around a cul-de-sac and comprises two opposing blocks of four houses terraces, two opposed single occupancy houses and closing the cul-de-sac is a semi-detached house, perhaps created from a hostel block. The housing is now privately owned and is in good condition.

Closer to the bunker at French Lane End, the junction of Coole Lane with French Lane (SJ 6533 4845), three pairs of semi-detached houses with hipped roofs were built. The new houses were built on the northern side of the junction opposite a pair of pre-existing semi-detached houses (SJ 64 NE 16). Aerial photographs indicate that the houses were built between May and October 1953 (540 RAF 1122, Frame 0179, 58 RAF 1288, Frame 0069). Between the main domestic and the houses at French Lane End in the garden of Coole Lane Cottage (SJ 6542 4890) is a double length Tarran type prefabricated bungalow. It is not known if this was associated with the site.

In total, accommodation was available for 15 officers, 18 senior non-commissioned officers, and 160 corporals and aircraftsmen. Communal mess facilities at the station were able to cater for 30 officers, 30 senior non-commissioned officers, and 350 corporals and aircraftsmen. The total cost of the domestic accommodation at the station

was £182,000 (NEAT/1997/169, Appendix R).

In addition to the personnel accommodated at Hack Green, many of the female assistant controllers were drawn from the local area, in particular Crewe, Nantwich, and the surrounding villages. Under the 'Local Service Scheme' all the women were full members of the Women's Royal Air Force (WRAF), but their conditions of service allowed them to live at home and not to be posted from the area without their consent (Rainford 1962, 51).

REGIONAL GOVERNMENT HEADQUARTERS 10.2

The R6 Structure

In the mid 1970s, the redundant R6 Structure was identified as a suitable location for the Regional Government Headquarters (RGHQ) for Home Defence Region 10.2. By this date the bunker had been derelict for almost a decade, refurbishment entailed virtual stripping and remodelling of the interior and relaying of the roof. This work was so extensive that few features from original structure remain. Contemporary drawings indicate that proposals to convert the bunker into a protected seat of government began as early as spring 1976. Air photographs, however, indicate that there no work had begun by 1978, for, the guard room at the entrance to the compound was still standing, as were the brick radar plinths or their foundations and associated structures in the adjacent field (OS SJ 64/74 Madeley, Frame 125). Conversion work probably did not start until 1980 and took around five years at a reputed cost of £22 million pounds. The RGHQ became operational in 1984, when the completed work was recorded by a PSA photographer (NMR P/G 28028). It was probably at this time that the guard room and radar plinths were demolished; the small electricity Sub-station was, however, kept.

The effects of the detonation of a nuclear weapon may broadly be categorised as blast, radiation, fire and an electromagnetic pulse. The RGHQ was designed to resist all these threats; bar a direct strike. Theoretically it was able to withstand an over pressure of 10kn/m². It was also able to resist acceleration forces of up to 80m/sec propagating through the ground as a pressure wave. Nuclear and thermal flash would also raise the outside temperature considerably. The protection afforded by the thick concrete walls meant that outside temperatures could rise to 300°C for 1½ hours, with the effect of raising the inside temperature by a mere 15°C. This could, however, be offset against the air conditioning system which could reduce the internal temperature by 4° degrees per hour. Impact from air blast and flying debris was another potential threat to the RGHQ. To counter this hazard the walls were designed to resist a 5kg steel ball, fired at 800m/sec without creating dangerous spalling on the inside. The doors could resist a 5kg steel ball fired at 20m/sec. The thick reinforced concrete walls would also be very effective in reducing the risk from radiation, which could be further lessened by the elaborate air filtration banks to diminish the hazard from radioactive dust entering the bunker.

The RGHQ retained the pre-existing approach track off French Lane. But a roughly rectangular compound, 110 by 59m was created around it, fenced by standard concrete posts with out-turned tops supporting three strands of barbed wire. Entry into the enclosure is through a pair of double gates.

Exterior

The most obvious external changes made to the structure in the late 1970s were the repositioning of the main entrance to the southern side and the addition of the Generator Room to the western elevation. The Generator Room abuts this wall, it projects 10.2m (33ft) from the building and is 9.2m wide (30ft). It is entered through a steel blast door on its southern side, and on the northern side a wider blast door was provided for the installation of the generators. On the western side are two steel blast plates which protect the air intake for the generators, behind the plates are metal mesh security screens. The louvred holes of the intakes are 3.305m (10ft 9ins) wide x 2.015m

(6ft 7 ins) high, on the interior are dampers to control the air supply and VOKES 'Supervee' 594mm (23 ins) square filters. On the southern wall are two similar blast plates which cover the exhaust ducts. Internally the room is divided into two. At the western end is the narrow Filter Room, which is entered through an internal steel door which gives access to the filters for maintenance. In the plant room to either side of the southern door are two diesel generators on steel skids. Another distinctive feature of this plant was the provision of an induction fan in the wall between the filter room and the generators. This was provided to draw in large volumes of air to cool the generators after a nuclear attack, where the external air temperature would be extremely high and therefore less effective for use in cooling. So great was the volume of air that could be inducted it would be impossible for a person to work within the generator room.

In the early 1990s an additional door was cut in north wall, which is described above.

Standing aside from eastern side of the bunker is a steel section radio mast.

Interior

During the late 1970s and early 1980s the bunker was extensively refurbished to allow it to meet its new role as a Regional Government Headquarters. Although the floor plans bear a superficial resemblance to a standard R6 floor plan most of the internal walls were built during the refurbishment. Partition walls built at this date are easily recognisable through the use of breeze block. The bunker was also completely re-roofed. In common with refurbishments carried out elsewhere at this date, the ceiling is covered with spray finish concrete, precluding a precise determination of the roof structure. The roof supports are positioned 2m (6 ft 6 ins) apart, and are 0.37m (1 ft 2.5 ins) wide and 0.47m (1 ft 6.5 ins) deep.

In its original configuration the bunker was approached from its south western corner up a flight of nine steps, 1.78m (5 ft 10 ins) high. During the refurbishment the cutaway corner was closed by the construction of the Generator Room, and the main entrance moved onto the southern elevation of the bunker. The steel blast door is 1.5m (5 ft) wide by 2.25m (7 ft 4 ins) tall, and in common with all those put in the 1970s and subsequently, is Swiss made. It opens outwards and has a rubber seal to enable positive pressure to be maintained within the bunker. Inside is a small lobby area at the foot of the original flight of stairs. At the head of the stairs a single door leads into the Decontamination Room, and to the left is the Control Room, with sliding glass screen to enable entry into the bunker to be monitored. Behind the Control Room is the electrical Switch Room.

The main air intake for the bunker used the original arrangement for the R6 bunker. This consisted of a raised projecting air intake on the eastern elevation of the bunker leading into an open passage way between the main southern bunker wall and a thinner outer wall. Below this at ground level is an opening in the southern elevation, the interior of which is sealed by a metal grill. During the refurbishment of the R6 a hole was knocked in the floor of the air-intake passage. This was done to create an alternative entry into the bunker when its was operating under fallout conditions. Entry into the bunker was through a steel door placed in the inner southern wall between two steel blast plates which protect the air intake filters. Behind the access door is a metal decking over the Heat Receiving Plant, to either side are filter rooms. These house

banks of ceramic air filters. Access from the filter rooms into the main bunker is through an airlock which leads into the Decontamination Room. This is equipped with a shower and a bin for the disposal of contaminated items. A single door also opens into this room from the main entrance, described above, and a single door opens into it from the main axial corridor beyond the Control Room.

At the Control Room the passageway turns right into the main axial corridor. This is set off centre and runs the length of the bunker. At the end of the corridor are three sets of double doors which may be used to segregate movement within this area. In keeping with the original configuration of the bunker a passage way leads to the Female Toilets and Showers. Adjacent to this is a single flight of stairs which leads down to the basement. Returning to the main corridor at the top of the stairs are a pair of double swing doors. Beyond these opening off the western side of the corridor are the Male Toilets and Showers, Sick Bay, Store, Female Dormitories and Male dormitories.

Ranged along the eastern side of the main corridor are the Uniformed Services Room, Common Room, Administration Room, the Kitchen, Store and Canteen, and another Male Dormitory in the north-east corner of the bunker. In the early 1990s a double blast door was inserted into the northern wall of this room to allow it be used as workshop. One of the most substantial alterations to the R6 was the insertion of a mezzanine level. this is accessed by a flight of stairs adjacent to the Administration Room. This floor houses a Strong Room, a Store Room and a large room of unspecified function. A staircase at the southern end of this room leads down to the Government Department's room.

At the northern end of the bunker was another entrance, this is entered through a steel blast door described above. In a corresponding arrangement to the main entrance access to the upper floor of the bunker was by a flight of concrete stairs. It was also through this entrance that most of the plant was installed into the bunker. To lift heavy loads a steel lifting beam is secured to the roof. At the head of these stairs is the only remaining 1950s blast door, with a bottom hinged window light above. Beyond this door a double swing door opens into the main axial corridor. At this end of the corridor is a stair well with a central shaft with a lifting beam above, to enable plant to be lowered to the basement.

The basement is laid out to a similar plan form to the upper floor with a long axial corridor placed directly below the upper corridor, thereby dividing the basement into two uneven portions. In the northwest corner of the bunker behind the stairwell is a small self-contained room to accommodate the drivers and maintenance men. Working southwards along the corridor doors lead off into the Senior Telecom Officer's room, the Information Room and double doors into the Plant Room from which access may be gained into the Tank Room. This houses a large Braithwaite tank to hold the bunker's water supply. At the end of the corridor a small flight of steps leads down to the Military Communications Room in the southwest corner of the bunker and two store rooms.

The most important rooms in the bunker were located along the eastern side of the bunker and were occupied by the regional commissioner and the services needed to support his role. The Regional Commissioner's Room was located at the centre of this complex. To the south was a large room occupied by representatives of selected government departments and adjacent to this a room for secretarial services. To either

side of the Commissioner's Room was the Principal Officer's Room and a Conference Room. To the north of the Commissioner's Room were rooms to be occupied by Common Services, a BBC office and studio and Scientists' Room. In the north-eastern corner of the bunker were located the main communications functions, including the ComCen (Communications Centre) Registry, a Radio Room, PMBX room, Communications Centre and in the corner of the bunker the British Telecom Equipment Room. Entry into this most sensitive area of the RGHQ was restricted by security desks placed at the entrances to the ComCen Registry and the Government Department's Room. Along the northern side of the bunker beneath the entrance passage is another storage area. The structure is in good condition. At present it houses a collection of Cold War artefacts and a number of rooms have been restored to their appearance during the 1980s.

Site Archive

A number of plans dating to the late 1970s, relating to the conversion of the R6 structure into a RGHQ and other miscellaneous material is held on site. A large collection of PSA photographs taken soon after the RGHQ was completed is held by the NMR.

The Air Defence Battle Command and Control Museum, RAF Neatishead, Norfolk has a model depicting RAF Hack Green at the end of the Second World War. It also holds secondary material on the history of radar, some which refers to Hack Green. The unit history of No.17 Signals Unit is held at the Public Record Office (AIR 29/2921).

ACKNOWLEDGEMENT

We are grateful to Mr R Siebert for allowing access to the RGHQ and to Mr B Lowry (local Defence of Britain co-ordinator) for sharing his knowledge on the sites around Hack Green. The report is the result of a field investigation carried out by Wayne Cocroft and Roger Thomas on 16 June 1997. Roger Thomas also took the 35mm record photographs.

SOURCES

Primary

Public Record Office

AIR29/2921 17 SU Hack Green Jan 56-Aug 57

PSA Photographs held by NMR

P/G 28028 CH Crown Building Hack Green Nantwich 13 11 1984, Colour 117 negatives

Air photographs consulted, held by NMR

OS/59/102.613 Frames 070, 071, 073, 09 Sep 1959.

OS SJ 64/74 19 June 1978 Madeley, Frame 125.

RAF 106G/UK 1459 Frames 4085, 4120, 02 May 1946.

RAF CPE/UK 1935 Frames 1464, 1465-6 17 Jan 1947.

RAF CPE/UK2499 Frames 4023-5, 12 Mar 1948.

RAF 541/557 Frames 3034, 3036, 05 Jun 1950.

RAF 540 RAF 992 Frame 0272, 20 Jan 1953.

RAF 540 RAF 1122, Frames 0178, 0179, 02 May 1953

RAF 58 RAF 1288 Frames 0069, 0082, 0083, 09 Oct 1953.

Drawings consulted on site

Site HAK Site plan for structure R6 c 1953 Scale 1.500

AD/75034/6 Hack Green Crown Building Cheshire Adaptations 6/4/1979

BW/75034/15 Hack Green Crown Building Diesel Generator Plant Room builders work details MPBW Aug 81

XB/75034/1 Hack Green Crown Building May 1976 New works to be added

XB/75034/2 Hack Green Crown Building May 1976

Air Defence Battle Command and Control Museum

Neat/1997/169 Headquarters Fighter Command 1956 *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*

Topographic model of RAF Hack Green *circa 1945* scale 1.1000 (on loan to Hack Green museum)

Secondary sources

BGS, 1967. British Geological Survey, Nantwich Sheet 122 Drift Edition.

Bullers, R F. 1991. *Royal Air Force Neatishead 50 years on 'We guard the skies'* Tri-Service Magazines Kettering

Dobinson, C S. 1996. *Twentieth century fortifications in England 3: Bombing decoys of WWII*. CBA/English Heritage. Unpublished report.

Gough, J. 1993. *Watching the Skies A history of ground radar for the air defence of the United Kingdom by the RAF from 1946-1975* HMSO London

Hartcup, G. 1993. *The silent revolution - Development of conventional weapons 1945-85* Brassey's

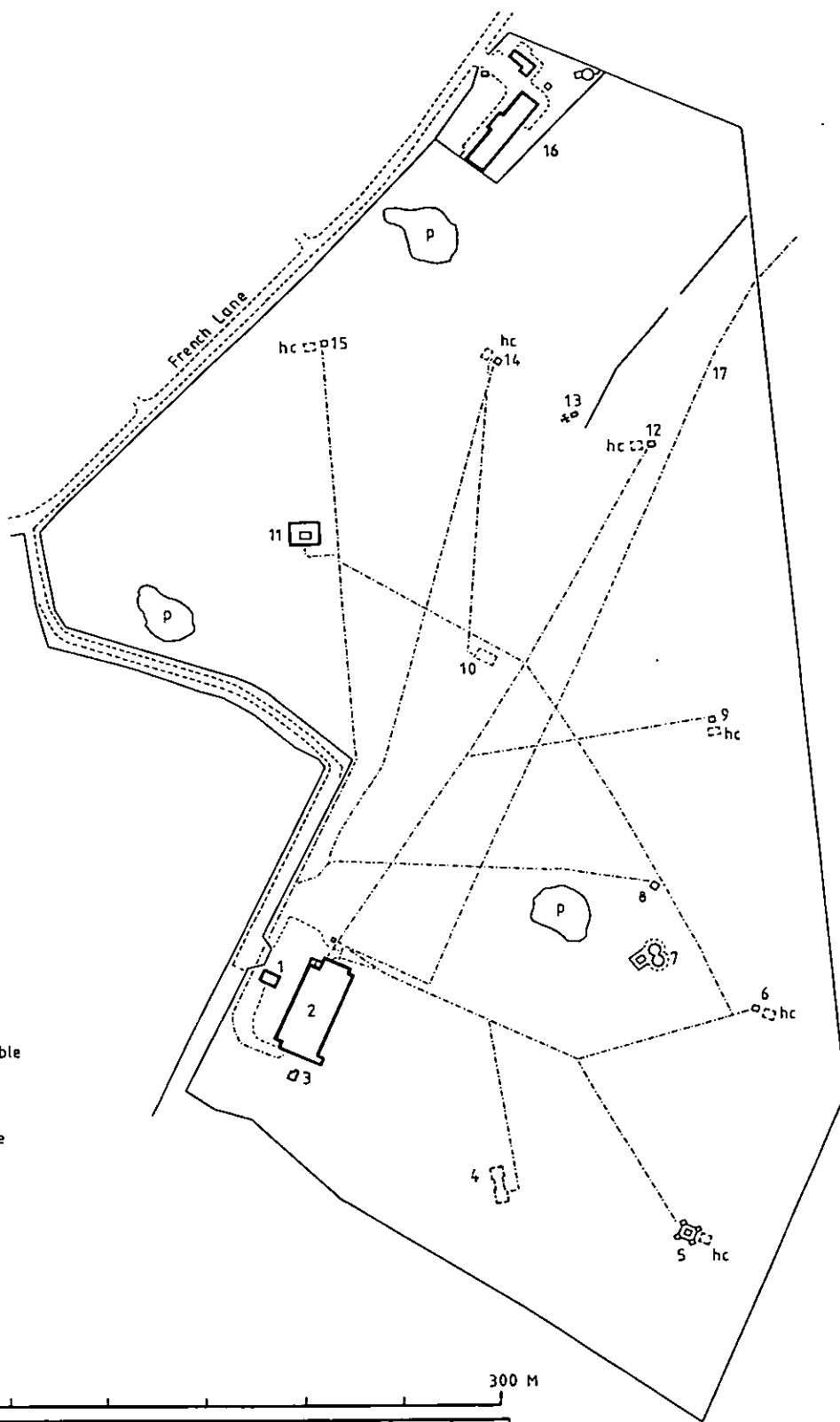
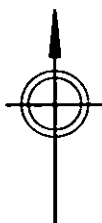
Ordnance Survey 1963. 1:2500 Plans SJ 63 47, 64 47, 64 48, 65 48, 65 49

Latham, C. and Stobbs, A. 1996. *Radar a wartime miracle* Alan Sutton Publishing Ltd

Lowry, B. (ed) 1995. *20th Century defences in Britain* CBA

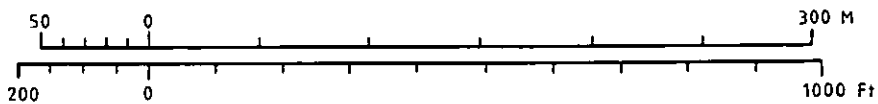
Rainford, R W B. 1962. 'The 'Blip' Squad' *Cheshire Life* May 50-1

Wood, D. 1992. *Attack Warning Red* Carmichael and Sweet



1. Guardroom
2. R6 Operations block
3. Sub-station
4. Structure (not built)
5. Type 14 radar
6. Type 13 radar
7. Sewage plant
8. ? Type 14 radar
9. Type 13 radar
10. Type 11 radar hardstanding
11. Type 7 radar
12. Type 13 radar
13. Aerial base (IFF)
14. Type 13 radar
15. Type 13 radar
16. 'Happidrome'
17. Buried stand-by power cable

hc hardstanding for crane
 --- cable duct
 p pond



ROTOR PERIOD RADAR STATION (c.1953)

HACK GREEN, BADDINGTON, CHESHIRE

NGR: SJ 645 479

NBR No: 96044

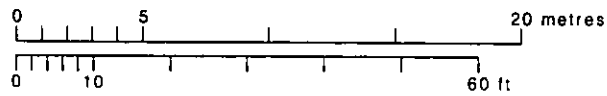
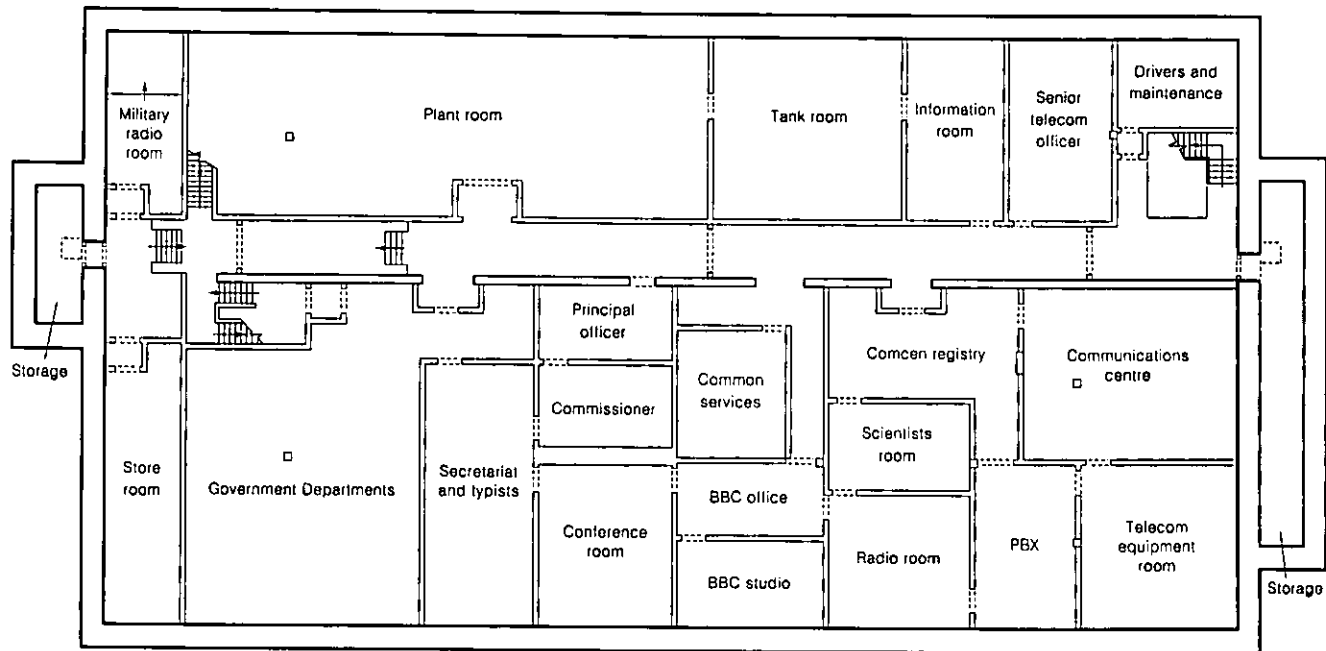
Drawn scale: 1:2500

Drawn by A.T. Adams

REGIONAL GOVERNMENT HEADQUARTERS 10.2 HACK GREEN
HACK GREEN, BADDINGTON, CHESHIRE

PLAN OF LOWER FLOOR

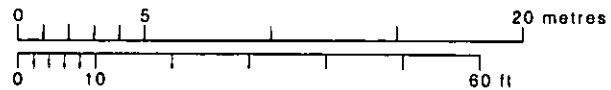
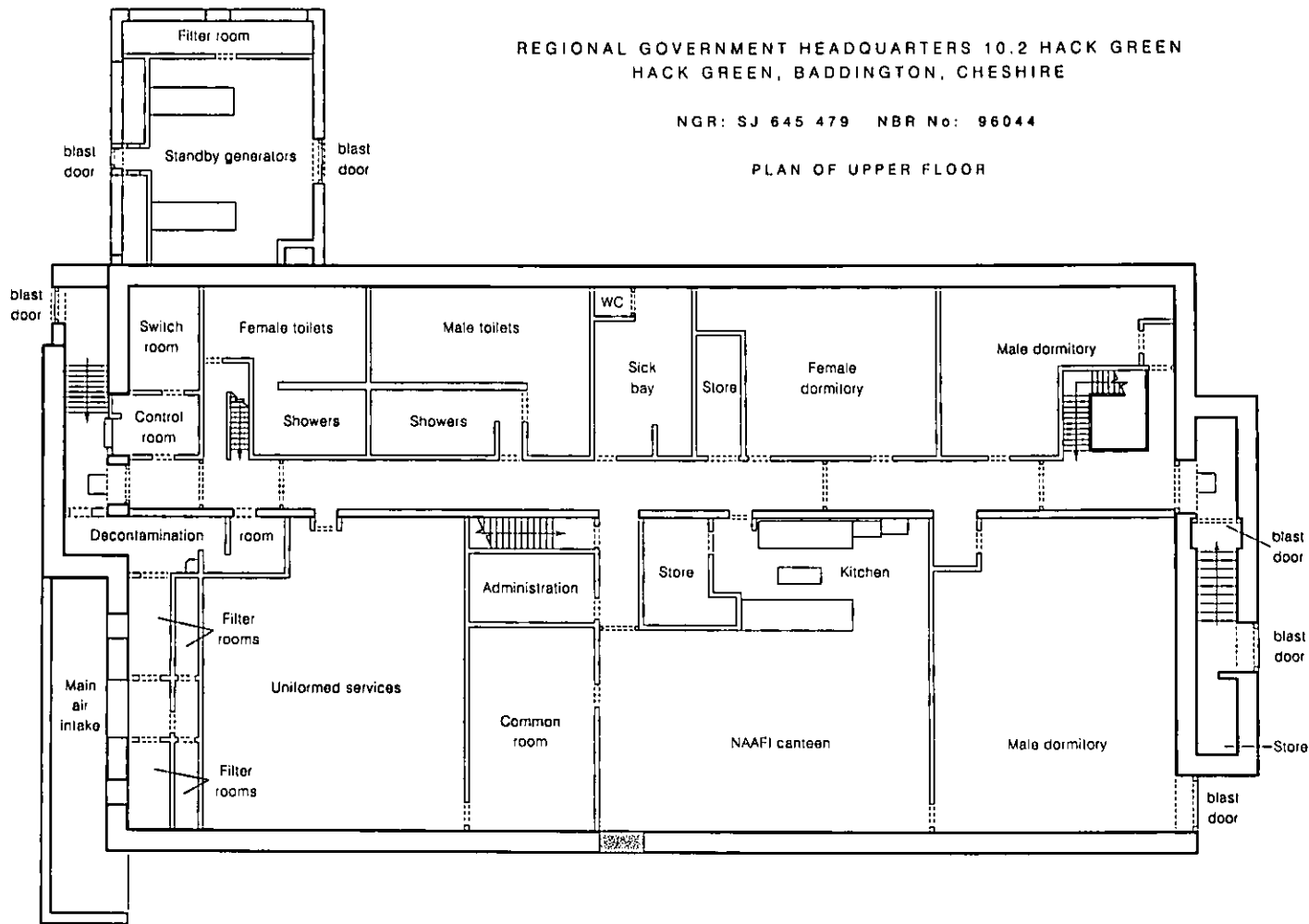
NGR: SJ 645 479 NBR No: 96044



REGIONAL GOVERNMENT HEADQUARTERS 10.2 HACK GREEN
HACK GREEN, BADDINGTON, CHESHIRE

NGR: SJ 645 479 NBR No: 96044

PLAN OF UPPER FLOOR



REGIONAL GOVERNMENT HEADQUARTERS 10.2 HACK GREEN
HACK GREEN, BADDINGTON, CHESHIRE

NGR: SJ 845 479 NBR No: 98044

PLAN OF MEZZANINE FLOOR

