

33 SQUADRON ASSOCIATION BATTLEFIELD TOUR

2018

ZEPPELIN HUNTERS : THE EARLY YEARS OF No. 33 (HOME DEFENCE)

SQUADRON RFC / RAF 1916—1918



A Hundred Years of Lincolnshire Aviation



ADMINISTRATION

Accommodation:

Best Western Plus
The Bentley Hotel
Newark Road
South Hykeham
LN6 9NH

Telephone: 01522 878000
Email: info@bentleyhotellincoln.co.uk
Website: www.bentleyhotellincoln.co.uk

Battle of Britain Memorial Flight

RAF BBMF Visitors Centre
Dogdyke Road
Coningsby
LN4 4SY
Telephone: 01522 782040
Email: bbmf@lincolnshire.gov.uk

Telephone: 01522 782040
Email: bbmf@lincolnshire.gov.uk

The Battle of Britain Memorial Flight Visitor Centre is located on the southern edge of Coningsby village, near the A153/A155 junction, on Dogdyke Road, adjacent to Royal Air Force Coningsby. The satnav postcode is LN4 4SY.

International Bomber Command Memorial

International Bomber Command Centre
Canwick Hill,
LN4 2HQ

Telephone: 01522 514755

Turning right into the Centre is not recommended so please approach the site from Bracebridge Heath on the B1131, which is easily accessible from the A15 and the City of Lincoln.

Petwood Hotel - No. 617 Sqn 'Dambusters' Officers' Mess

Stixwould Road
Woodhall Spa
LN10 6QG

Telephone: 01526 353473
Email: reception@petwood.co.uk
Website: www.petwood.co.uk

Newark Air Museum

Newark [Notts & Lincs] Air Museum Ltd
Drove Lane
Newark
Nottinghamshire
NG24 2NY

Telephone: 01636 707170
Curatorial enquiries: [Mon – Fri] on 01636 705585
Email: enquire@newarkairmuseum.org

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Dave Stewart

ITINERARY

Day 1: Fri 5 Oct

0900 - Party RV at RAF Benson Guardroom

0930 - ETD RAF Benson to Coningsby

(170m—3.00)

1130 - RV and lunch in Ginger Cow Coffee House, 26-28 Silver Street, Coningsby LN4 4SG (Tel: 01526 343580)

Stand One - RAF Coningsby, BBMF Visit

1330 - Check in at Battle of Britain Memorial Flight Visitor Centre (Satnav LN4 4SY)

1400 - RV with BBMF Guide - Clive Rowley for Hangar Tour - ETD 1600

1630 - 1700 Visit CWGC Scopwick - grave of Plt Off J G Magee RCAF Age 19

(12m - 0.25)

1730 - ETA Best Western Bentley Hotel Lincoln - check in

(14m - 0.30)

Day 2: Sat 6 Oct - 33 (HD) Squadron RFC in Lincolnshire

0800 - Breakfast - ETD 0915

Stand One - Gainsborough

1000 - Bentley Hotel to Gainsborough Cemetery. RV with Author and Historian, Peter Bradshaw

(20m - 0.45)

1000 - 1300 - Visit 33 Sqn Graves and HD Airfield Sites - (Pub Lunch in Town/Area)

Stand Two - RFC Brattleby (Scampton) (tbc)

Stand Three: RFC Manton (Kirton in Lindsey)

1330 - 1400 - Visit 33 Sqn Airfield site at Kirton in Lindsey

(12m - 0.25)

Stand Four: RFC Elsham (tbc)

Stand Five: International Bomber Command Memorial

1500 - 1645 - Visit International Bomber Command Centre Lincoln

(20m - 0.40)

1700 - ETA Best Western Bentley Hotel Lincoln

(6m - 0.15)

1900 - Depart for Evening Meal

(25m - 0.40)

Stand Six: Dinner at the Petwood Hotel, Woodhall Spa

Op Chastise Narrative in No. 617 Sqn "Dambusters" Officers' Mess

Day 3 - Sun 7 Oct

0800 - Breakfast - Check Out ETD 0930

Stand One—Newark Air Museum

1000 - Visit Newark Air Museum - RV with Guide Kev Graham - (Lunch in Museum)

(10m - 0.20)

Update on 'CE', Puma HC Mk1 XW208 rebuild.

Mid Afternoon - RTB RAF Benson

(145m - 2.30)



INTRODUCTION

Why would an Association like ours, consisting in the main of people who have been associated with 33 Squadron as a helicopter unit since it brought the Puma HC Mk1 in service in 1971, be driving 'up North' in October to conduct a battlefield tour in Lincolnshire, a county that is proud of its association with Bomber Command and contains so many airfields from World War Two that were home to the RAF's Hampdens, Wellingtons, Whitleys, Stirlings and Lancasters? There are a number of good reasons.

No. 33 Squadron, Royal Flying Corps (RFC) was formed from a nucleus of No. 20 Squadron at Bristol Filton Aerodrome on 12 January 1916 as part of an initiative to counter the German Zeppelin raids on Britain. The first airfields in Lincolnshire were set up under the auspices of the RFC in 1915-16. Having moved initially to York on 29 March 1916, No. 33 Squadron RFC was redeployed south on 3 October 1916. Arriving in Gainsborough it established its Headquarters (HQ), a small landing ground and workshops in Gainsborough and set up three airfields at Elsham, Manton near Kirton in Lindsey, and Brattleby, an airfield later renamed Scampton.

Having been born in the South West, No. 33 Squadron was to learn the first of its many trades in the North-East as a Home Defence squadron, where it was stationed to protect the industrial areas of Leeds, Sheffield and the Humber from air attack. First equipped with Royal Aircraft Factory B.E.2s, B.E.12s and Bristol Scouts, these were replaced by Royal Aircraft Factory F.E.2s, then Bristol Fighters from June to August 1918. The Squadron then received a dedicated night fighter, the Avro 504K. In addition to Home Defence air defence patrols, 33 also trained pilots and observers in night flying and C Flt, at Elsham, co-operated with the artillery batteries located at Spurn Head and Kilnsea.

Although No.33 Squadron did not shoot down a Zeppelin, many hours were spent patrolling and chasing the German airships, often at night and in marginal conditions, flying conditions that were new to many of the pilots. The Squadron lost fourteen aircrew to flying accidents or catastrophic technical failures, of whom eight lie buried together in the Gainsborough General Cemetery. In the year that the RAF celebrates its 100th birthday, it is fitting that we are able to pay our respects to some of the first men of 33 Squadron who gave their tomorrows for our todays.

We will see that many of the grass airfields and Emergency Landing Grounds that were established to support the Northern and North Midland Home Defence Wings were destined to become fighter and

bomber stations in the late 1920s and early to mid-1930s, as Nazi Germany's aims became clearer and clearer. Several of the bases initially set up for 33 Squadron are still in use today, or were in use in living memory. The County of Lincolnshire is known as 'Bomber County' and we know that having been disbanded in June 1919 it was as a bomber squadron that 33 was reformed in March 1929 with Hawker Horsleys. Less than twelve months later, in February 1930, 33 was the first squadron to receive to fly the new Hawker Hart, an excellent light bomber of its day, and it was a bomber squadron that 33 was deployed to Egypt in October 1935. For a period over in the Middle East, Arthur Harris was Air Officer Commanding (AOC) Transjordan, the man we all associate today for the establishment and success of Bomber Command. Several 33 Squadron pilots whose first or second tours were with the squadron in the Middle East returned to the UK in the late 30s and became key players within Harris' organisation, either as pilots, squadron commanders or senior staff officers.

For example, the officer who was given command of No. 33 Squadron for its reformation in 1929, Squadron Leader Francis Percival Don, was an Air Commodore by 11 July 1938 and Senior Air Staff Officer (SASO) No. 2 (Bomber) Group at Wyton. Squadron Leader Don had handed over command of the Squadron to Joseph Breen, who had transferred from the Army to the RAF in 1918 as a staff captain, and was promoted to Squadron Leader in 1925 following a staff tour at the Air Ministry. He trained as a pilot with No.24 Squadron at Northolt in 1927, yet his first tour thereafter was in command of an Armoured Car Wing in Iraq, a post that commenced in April 1928. Six months later, he was posted to Shaibah to command No. 84 Squadron, flying Wapitis. Breen returned to Britain in October 1929 to take command of No.33 Squadron. In 1931 he attended Staff College and, as a Wing Commander, was posted to the Air Staff of the Air Defence of Great Britain (ADGB) Western Area /Wessex Bombing Area. In 1935 he went to HQ Sudan Defence Force Khartoum. In July 1937 he was promoted to Group Captain and returned to Britain in November to take up the post of SASO No.4 (Bomber) Group at Linton-on-Ouse, under the then Air Commodore Arthur Harris. He moved to the AOC No.1 (Bomber) Group position on 27 June 1940 but moved shortly afterwards to become the Air Ministry's Director General of Personnel where he stayed for four years. In 1944 he became Head of the Postwar Planning Executive, and retired as an Air Marshal on 2 May 1946.

Another former CO, Hugh Walmsley, had made Group Captain by March 1942 and was in command of No.6 Training Group, which had formed on 2 September

1939 at Abingdon. No. 6 Group looked after fourteen 'Group Pool' squadrons, whose job it was to provide operational training to newly qualified aircrew. The squadrons changed their titles to Operational Training Units (OTUs) in the early 1940s, and No. 6 Group became 91(OTU) Group on 11 May 1942. Walmsley, who had won the MC in 1918, was awarded the DFC in 1922 and would be Mentioned in Dispatches five times during World War Two, stayed at 91 (OTU) Group until 1944. He took over as AOC No. 4 (Bomber) Group on 7 May 1945, then went out to the Far East to become AOC Transport Command in SE Asia from 1945 to 1946, followed by a tour as AOC Air HQ India from 1946 to 1947. He then returned to Britain to take up the post of Deputy Chief of the Air Staff (DCAS) in 1948, and moved into his final post, as AOC Flying Training Command, in 1950. Air Marshal Walmsley retired from the RAF in 1952.

Finally, anyone entering or leaving RAF Benson cannot help but notice the blue Spitfire gate guardian outside Station Headquarters, opposite the Main Guardroom. The aircraft is a replica of the one that Flying Officer Jerry Fray took off very early in the morning of 17 May 1943 to fly over to Germany and take photographs of the results of the Dambusters Raid. Jerry was a member of No. 542 PRU Squadron based at RAF Benson.



Flying Officer Jerry Fray

Whatever reason you care to use for coming on the Tour, I hope that you enjoy the next three days and feel proud of what the Squadron, and the RAF, has achieved over the last 100 years - or 102 years in 33's case!

DS



Fighter, bomber, photo-reconnaissance platform, 1917-1918 style! Lieutenant James Menzies flying in an F.E.2.b. Photograph courtesy of Peter Menzies.

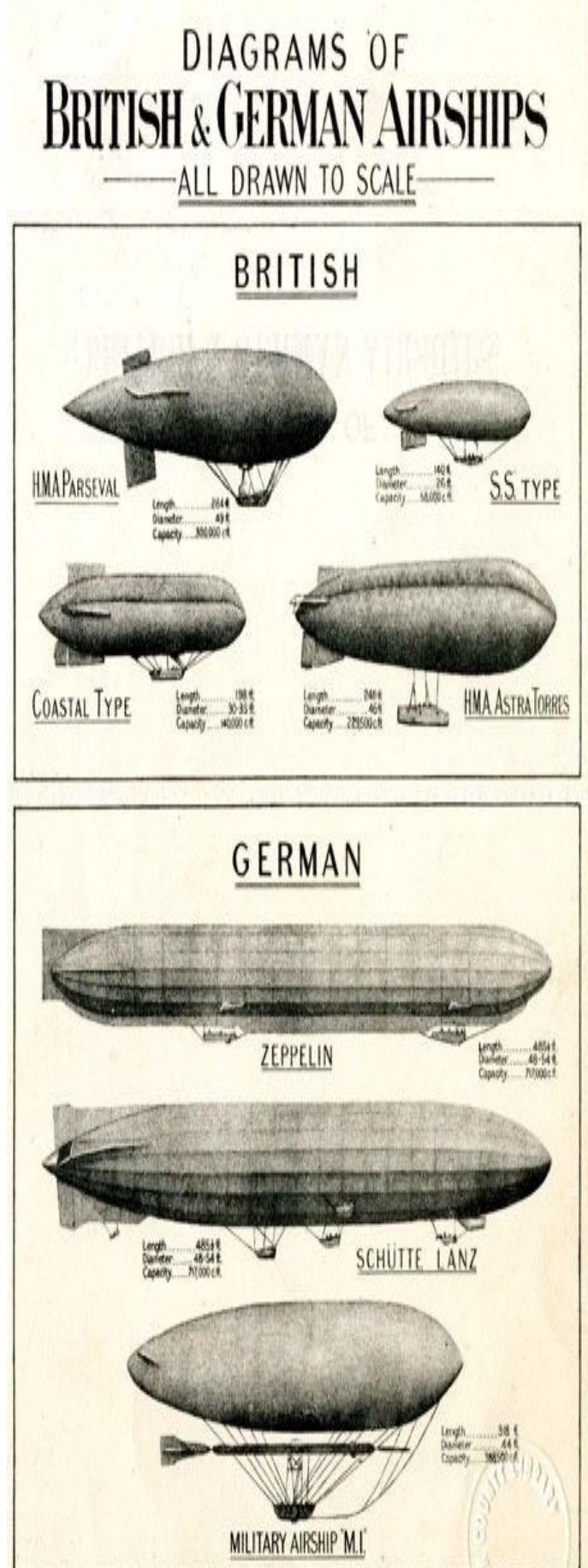
The Air Defence of Great Britain

Historical Background

The first months of the war in the air, predominantly a story of the work of the Royal Flying Corps (RFC), was not exclusively confined to the Army's air component. The Royal Naval Air Service (RNAS) had assumed responsibility for the aerial defence of Britain in September 1914, due to the entire strength of the RFC being despatched to France in August. It was more a paper responsibility than any semblance of practical ability to fulfil such a role. In terms of aeroplane 'defence', the protection of London was afforded by a solitary 70hp Gnome-engine Caudron, whose pilot flew it from Eastchurch to Hendon on 7 August 1914. Fortunately the much-feared Zeppelin raids against England were delayed by the shortage of airships in Germany and several disastrous accidents.

It was, in fact, the Royal Navy that launched the first successful aerial offensive against the enemy when two Sopwiths from an RNAS detachment based near Antwerp bombed an airship shed at Düsseldorf on 8 October 1914. The RNAS followed this with a 'deep strike' against the Friederichshafen airship works on the shores of Lake Constance on 21 November, with three Avros flying from their base at Belfort and following the Rhine for approximately 120 miles. Two out of three aircraft returned safely. Nations now had clear evidence that the invention of airships and aeroplanes meant that countries could no longer rely on the sea to provide a barrier against air attack, aircraft could attack people and infrastructure far beyond the coast.

From 1915 Germany began by using slow and vulnerable airships to bomb Britain before turning later to using aeroplanes based in Belgium. Although the major effort of the RFC throughout the war was made along the Western European battle zones in France and Belgium, there was recognition in Britain of the necessity for Home Defence. Both the RFC and RNAS were called on to provide a steadily widening network of aerial defences to combat the German airship and, later, aeroplane raids on England. The problems of defence of the U.K. were basically due to a lack of suitable aircraft able to tackle airborne raiders on anything like equal terms. The ever open maw of the battle fronts consumed virtually all newly manufactured aircraft and components as the attrition rate of combat inevitably rose. Such aeroplanes and equipment as could be spared for defending the homeland were mainly obsolete or unsuited for first line operational duties. Cumbersome BE2s, hastily armed but woefully underpowered, constituted the main type of defender by 1916, though a few isolated successes against



marauding Zeppelins were achieved in late 1916 by pilots like Captain William Robinson, flying a modified BE with No. 39 Squadron, who was awarded an immediate VC for his destruction of the German airship SL11 on the night of 2 September. It was to counter the Zeppelin threat that No. 33 Squadron was formed to become part of the Home Defence organisation, moving to the Lincolnshire area in order to defend the industrial cities of the North East.

In 1917 the Germans turned to using aeroplanes based in Belgium to bomb Britain and the first daylight raids on south-east England highlighted the weaknesses in the British defences. British aircraft tried to shoot the bombers down but they were difficult to find, and the anti aircraft batteries were not very effective. The raid carried out at noon on 13 June 1917 by 14 German twin-engined Gothas (photo, top, right) on London, dropping 4 tons of high explosives on the Docklands area, killing 162 people and injuring 432. On 7 July another raiding force of 22 Gothas appeared over London during the morning and bombed at leisure without any significant interference from the defences. (Photo, centre, right). A consequence of the Gotha raids was Major-General Edward Ashmore being asked to take over the newly established London Air Defence Area and reorganise the air defences. In order to provide a more coordinated response to defend London and the south coast from future raids. Ashmore introduced a barrier of anti-aircraft guns around London to fire at enemy aircraft from the ground and prevent them from reaching the city.



Searchlights made the aircraft easier to see and gave the guns a better chance of hitting the target. Patrol areas were set up to allow British aircraft to patrol the skies without the danger of being fired at by the anti-aircraft guns below. Major General Ashmore (photo, top, right) also introduced a new tactic. Special balloons were attached together with long cables and floated high in the air. Cables hung down from the balloons to create an obstacle in the sky and was known as a 'balloon apron'. The apron was designed to force enemy bombers up to an altitude where they could be more easily found by the gunners and the pilots. It also made the bombers' task of dropping their bombs accurately more difficult as they were flying much higher above their targets. Ashmore's system for defending London and the rest of the country formed the basis for the system put in place during the Second World War, most notably during the Battle of Britain in 1940.



The air attacks on London proved to be the catalyst to resolving the long standing rivalry between the Admiralty and the War Office and work towards a unified air effort. Vociferous demands for immediate retaliation against German cities - a wholly impracticable task for the contemporary air services - forced the government to set up an immediate inquiry into the whole question of the national air effort. Prime Minister Lloyd George appointed the South African Boer War veteran, Jan Smuts (photo, centre, right), as head of the inquiry committee and less than two months later Smuts presented his findings, condensed into two reports. From the Smuts Report came the recommendation that an independent air force was necessary. The Air Force Bill, which included the creation of the Air Ministry, was formally introduced in the House of Commons on 8 November 1917. The Bill was passed to the House of Lords on 16 November, was returned to the House of Commons on 27 November and received the Royal Assent on 29 November 1917.



On 1 April 1918 the RFC and RNAS was amalgamated and became the Royal Air Force. That day King George V sent the following telegram to Lord Rothermere (photo, bottom, right):

'Today the Royal Air Force, of which you are the Minister in charge, comes into existence as the third arm of the defences of the Empire. As General-in-Chief I congratulate you on its birth and I trust that it may enjoy a vigorous and successful life.'

GEORGE RI



Day One / Stand One: The Battle of Britain Memorial Flight, RAF Coningsby

History

In the years following World War II it became traditional for a Spitfire and Hurricane to lead the Victory Day flypast over London. From that event there grew the idea to form a historic collection of flyable aircraft, initially to commemorate the RAF's major battle honour, the Battle of Britain, and latterly with broadened scope, to commemorate the RAF's involvement in all the campaigns of World War II. Thus in 1957 the Historic Aircraft Flight was formed at RAF Biggin Hill with one Hurricane (LF363) and three Mk XIX Spitfires (PM631, PS853 and PS915), in what, even then, had become a predominantly jet-powered air force. There is evidence that at least one of the Spitfires sometimes flew with a single Hawker Hunter F5 of 41 Sqn (the last operational squadron to operate from RAF Biggin Hill) which co-resided with the Spitfires and Hurricane at that time. The two aircraft together were referred to in an official Biggin Hill "At Home" Day Display programme as the 'Battle of Britain Flight'.

Originally the RAF Historic Aircraft Flight, with a small group of Spitfires and Hurricanes operating from RAF Coltishall from 1963, the group became the "Battle of Britain Memorial Flight" in 1973, with the acquisition of the Lancaster.

Coningsby

BBMF moved to its present home at RAF Coningsby in 1976, since then it has acquired several more aircraft including, the first Chipmunk acquired in 1983, a Dakota was originally acquired in 1995, as a more reliable multi-engine trainer than the De Havilland Devon, that was nicknamed the 'Devon State Two', due to its tendency to return to the ground on an emergency state two; but has since taken a fuller role in BBMFs line up. The Spitfires and Hurricanes in the flight have varied over the years, as new aircraft are acquired and older ones passed to museums or used for parts.

Avro Lancaster

The Lancaster bomber - PA474, acquired by the BBMF in 1973, is one of only two surviving airworthy examples of the type; the other is in Canada. She was built in mid-1945 and assigned to reconnaissance duties after appearing too late to take part in the bombing of Japan. After various duties, she was adopted by the Air Historical Branch for display work. She appeared in two films: Operation Crossbow and The Guns of Navarone. Having been flown for much of her service with the BBMF as the "City of Lincoln",

PA474 previously wore the markings of the "Phantom of the Ruhr", a Lancaster that flew 121 sorties (a so-called "ton-up" Lancaster). Originally assigned to 100 Squadron in June 1943, the original "Phantom" was transferred to 101 Squadron in November that year and finished the war as part of 550 Squadron at Ludford Magna. The Lancaster currently carries the markings of 'Thumper' for the 2014 display season, an aircraft which served with No 617 Squadron after the Dams Raid. Some of the specially-modified Lancasters, which survived the Dams Raid, remained in service with the squadron afterwards. However, these aircraft were not suitable for all operations and they were replaced with standard Lancasters, one example being B Mk1 DV385. PA474 displays the markings of bombs for operations over Germany, ice-cream cones for operations over Italy and poppies when she releases poppies during exhibition flights.

Hawker Hurricane

There are two Hurricanes. LF363 is a Mk IIc and the last Hurricane to have entered service with the RAF. She appeared in the films Angels One Five, Reach for the Sky, The Battle of Britain,[2] and a TV series The War in the Air. PZ865, is a Mk IIc built six months after LF363; she is the last Hurricane ever to have been built. She once wore the inscription "The last of the Many" on her port and starboard sides - the original fabric with this inscription is now located in the BBMF Headquarters at RAF Coningsby.

Supermarine Spitfire

Individual aircraft have historic heritages; the oldest of the Spitfires, P7350, is a Mk.IIa, which originally flew in the Battle of Britain in 1940, with 266 and 603 Squadrons. In 2011 she was repainted in the 41 Squadron code 'EB-G', which represents the aircraft flown by Pilot Officer Eric Lock on 5 September 1940, when he destroyed three aircraft in a single sortie.

The Mk Vb Spitfire, AB910, escorted convoys in the Battle of the Atlantic. She then flew escort patrols during bombing raids on the German battleships Scharnhorst and Gneisenau, then (as part of No. 133 squadron), she fought in the Dieppe Raid. Capping this long career, as part of No. 402 Squadron RCAF, she flew cover patrols over the Normandy beaches on D-Day and in the subsequent weeks – as did another of the flight's Spitfires, with No. 443 Squadron RCAF. AB910 now [when?] wears the 133 squadron codes 'MD-E' which she actually wore during the Dieppe Raid.

The Mk LFIXe Spitfire, MK356, was built in March 1944



Hawker Horsley

The Horsley was a single-engined biplane bomber of the 1920s and the last all-wooden aircraft built by Hawker Aircraft. The Horsley served as a medium day bomber and torpedo bomber with the RAF between 1926 and 1935.

Crew: 2 - pilot and bombardier/gunner

Length: 38 ft 10 in (11.83 m)

Wingspan: 56 ft 5 $\frac{1}{4}$ in (17.22 m)

Height: 13 ft 8 in (4.16 m)

Wing area: 693 ft² (64.38 m²)

Empty weight: 4,760 lb (2,164 kg)

Loaded weight: 7,800 lb[22] (3,545 kg)

Powerplant: 1 × Rolls-Royce Condor III V-12, 650 hp (485 kW)

Maximum speed: 125 mph at 6,000 ft (201 km/h at 1,829 m)

Range: 900 mi [19] (783 nmi, 1,449 km)

Service ceiling: 14,000 ft (4,267 m)

Climb to 10,000 ft (3,045 m) : 14 minutes 20 seconds

Endurance : approx. 10 hours

1 × forward-firing .303 in (7.7 mm) Vickers machine gun

1 × rear-mounted .303 in (7.7 mm) Lewis Gun

1,500 lb (680 kg) bombload or 1 × torpedo



Hawker Hart

In 1926, the Air Ministry stated a requirement for a two-seat high-performance light day-bomber, to be of all-metal construction and with a maximum speed of 160 mph (258 km/h). The production Hawker Hart day bomber had a 525 hp (390 kW) Rolls-Royce Kestrel IB 12-cylinder V-type engine, a speed of 184 mph (296 km/h) and a range of 470 mi (757 km), making it faster than most contemporary fighters. The Hart entered service with No. 33 Squadron RAF in February 1930.

Crew: 2 - the observer sat behind the pilot, and was armed with a single Lewis gun on a ring mount, while for bomb-aiming, he lay prone under the pilot's seat.

Length: 29 ft 4 in (8.94 m)

Wingspan: 37 ft 3 in (11.36 m)

Height: 10 ft 5 in (3.18 m)

Wing area: 349.5 ft² (32.5 m²)

Empty weight: 2,530 lb (1,150 kg)

Max. takeoff weight: 4,596 lb (2,089 kg)

Powerplant: 1 × Rolls-Royce Kestrel IB water-cooled V12 engine, 510 hp (380 kW)

Maximum speed: 161 kt (185 mph, 298 km/h) at 13,000 ft

Range: 374 nmi (430 mi, 692 km)

Service ceiling: 22,800 ft (6,950 m)

Climb to 10,000 ft: 8 minutes, 30 seconds

Guns: 1 × synchronised forward firing .303 in (7.7 mm) Vickers machine gun, 1 × .303 in (7.7 mm) Lewis Gun on Scarff ring in rear cockpit.

Bombs: Up to 500 lb (227 kg) bombs under wings.

with clipped wings optimised for low level flight, and fitted with a Merlin 66 engine. Allocated to the Royal Canadian Air Force 144 wing, based in various locations around southern England, she took part in the Rodeo fighter sweep over occupied France in the weeks leading up to D-Day. After the war she served as a gate guardian at Hawkinge and Locking, and was recovered and refurbished in 1992 for the BBMF. As of 2008, she is displayed in a silver paint scheme used in late 1944 fighter/bomber missions over the Balkans from bases in Southern Italy.

There are also two PRXIX Spitfires, both built in 1945 with Griffon 66 engines. PM631 was too late to see operational services in World War II and carried out civilian duties with the Temperature and Humidity Monitoring (THUM) Flight at RAF Woodvale until 11 July 1957, when she became part of the Historic Aircraft Flight; she is the longest serving aircraft in the BBMF and is currently painted to represent a 541 squadron Spitfire.

PS915 performed various reconnaissance duties at Wunsdorf in Germany. She returned to the UK in 1954, and was retired to gate guarding duties. In 1987 she was modified with a Griffon 58 engine and refurbished to flying condition by British Aerospace. She currently carries the markings of PS888 of 81 Squadron based at Seletar, Singapore, during the Malayan Emergency which conducted the last operational RAF Spitfire sortie on 1 April 1954, photographing communist guerrilla hideouts over an area of jungle in Johore. The ground crew painted the inscription "The Last!" on PS 915's left engine cowling.

One Mark XIX Spitfire, PS853, was sold in 1994 to defray the costs of rebuilding Hurricane LF363 after her crash-landing on the runway at RAF Wittering due to engine failure in 1991. The BBMF pilot escaped with a broken ankle and minor bruises, whilst LF363 was engulfed and devastated by the resulting fire.

Spitfire Mark XVI TE311 was acquired in 2002 and initially allocated for spares, but officially added to the BBMF collection in 2007. TE311 was made airworthy in the later stages of the 2012 display season and will be joining the flight to carry out commemorative sorties in 2013

Douglas Dakota

The Dakota, ZA947, built at Long Beach, California in March 1942, was issued to the US Army Air Forces and later transferred to the Royal Canadian Air Force where she served until 1971. The aircraft was purchased by the Royal Aircraft Establishment before being issued to the BBMF in March 1993. She is equipped with authentic period 'para seats' and is used in commemorative parachute drops.

The Dakota did serve solely as a support aircraft for the flight and as a multi-engine tail-wheel trainer for the Lancaster; but she is also a display aircraft in her own right and has become increasingly popular with the public .

33 (Bomber) Squadron

When the Squadron reformed at Netheravon on 1 March 1929 it reformed with Hawker Horsleys as a Bomber squadron. Just one year later it was the first squadron to receive the new Hawker Hart, a light bomber in February 1930 that was quicker than many contemporary fighter aircraft. The Squadron became renowned for its formation bombing skills, regularly exhibited during annual Air Exercises and the Royal Air Force Display at Hendon. If 33 had not been sent out to Egypt in 1935, to play a part in the air policing of Palestine, there is every possibility that 33 would have become part of the RAF's fledgling RAF Bomber Command, which began to take shape in 1936. Group Captain Arthur Harris was SASO Middle East Command in 1937. On 2 July 1937 he was promoted to Air Commodore and put in command of No.4 (Bomber) Group, but was soon back in Palestine/Trans-Jordan as AOC, where he was promoted to Air Vice-Marshal on 1 July 1939. He returned to Britain in September 1939 and took command of No. 5 (Bomber) Group. 33 Squadron's ORB while in the Middle East mention Harris inspecting No. 33 Squadron during formal inspections, and as AOC he would have been well aware of the Squadron's capabilities as a bomber squadron. A study of the staff lists of the various Bomber Groups at the beginning of the war reveal a number of senior officers and pilots from No. 33 (Bomber) Squadron who, on posting from the Middle East back to Britain were posted into key staff positions or became bomber pilots.

But for the decision to replace the Hawker Harts with Gloster Gladiators, and change 33's role from Bomber to Fighter squadron, our Squadron history might have been tied more to the magnificent Lancaster on display here, rather than the equally magnificent Hurricane and Spitfire with which the Squadron performed so admirably from October 1940 to December 1944. Yet the Squadron played its part as escort for Bomber Command missions while on the Continent, a mission that was not exactly welcomed by the 'Mixed Pickles', as Jan Linzel will describe shortly.

33's 'Meivlieger', Jan Linzel, recalls bomber escort duties ...

"...We also got annoying and boring missions. For example, if there was a really large 'show' with lots of bombers and they had insufficient escorts we had to go with them. There was always a certain number of fighters with them for protection. They called us the 'mixed pickles' because our squadron hosted so many different nationalities. You took a 90 gallon long range fuel tank with you and then you had to fly at 25 000 – 30 000 feet, above the bombers. It was deathly cold! It was not for us! We were equipped and trained for 'low-level'. Our Spitfires had shorter wings, which made turning at low altitudes much easier. But they were not so useful for flying high. Our Spitfire IXBs had very little heating. You sat in your normal uniform. Anyone wearing too many clothes would not fit into the cockpit. Moreover, you had a 'Mae West' on and in place of the parachute 'cushion' we had a dinghy, a folded rubber boat that also took up a lot of room. I had a pair of socks that I cut the feet off and I wore them over my knees for these flights. You wore thin gloves with a silk inner. It was just enough. The first time I got back from one of these escort missions, I thought I had knees made of glass, it was deathly cold! The Jerries often thought that we were the bombers. Although they could not see us they had us on the radar, therefore we also attracted lots of heavy flak. By some miracle I always managed to get through.

Once we were flying up there when Squadron Leader Mitchell suddenly gave the order: "Shoelace ninety degrees port." That meant that we had to make 'cross-overs' during the 90 degree turn. After the turn the left section was sat on the right. The right section went to the left. Everyone flew in a very wide formation and within the sections one also made crossovers. It was a complicated manoeuvre but we were really well trained. We did this constantly to make ourselves less vulnerable. When we were halfway through the turn there suddenly arose a great cloud of exploding flak, precisely where we would have been if we hadn't carried out the turn. The Germans could not see us as we were sat above the clouds. However, their radar was very good. They could not tell the difference between fighters and bombers on their screens. How did Mitchell know that? He must have had a sixth sense. What is was was **cold**. Around 40 to 50 degrees below zero! The canopy of the Spitfire was made of armoured glass, which chilled down to the low temperatures found at such great heights. When we descended the water vapour condensed on the cold canopy and immediately froze. There was such a thick layer of ice which was totally transparent. You could no longer see anything through the front windshield. As you could see nothing ahead you had to look sideways and tried, with the cockpit canopy slid

back, to come in and land. The long range fighters, for whom this work was normal, had a 'pilot relief tube', a funnel and, of course, good heating. The 90 gallon long range fuel tanks made the plane hard to handle, we were all over the place like a car with no suspension. I didn't like it!



33 SQUADRON AREA OF OPERATIONS: OCTOBER 1916



Atwick

HORNSEA

Crash sites

Beverley

HULL

New Holland

Elsham

SCUNTHORPE

GRIMSBY

Hibaldstow

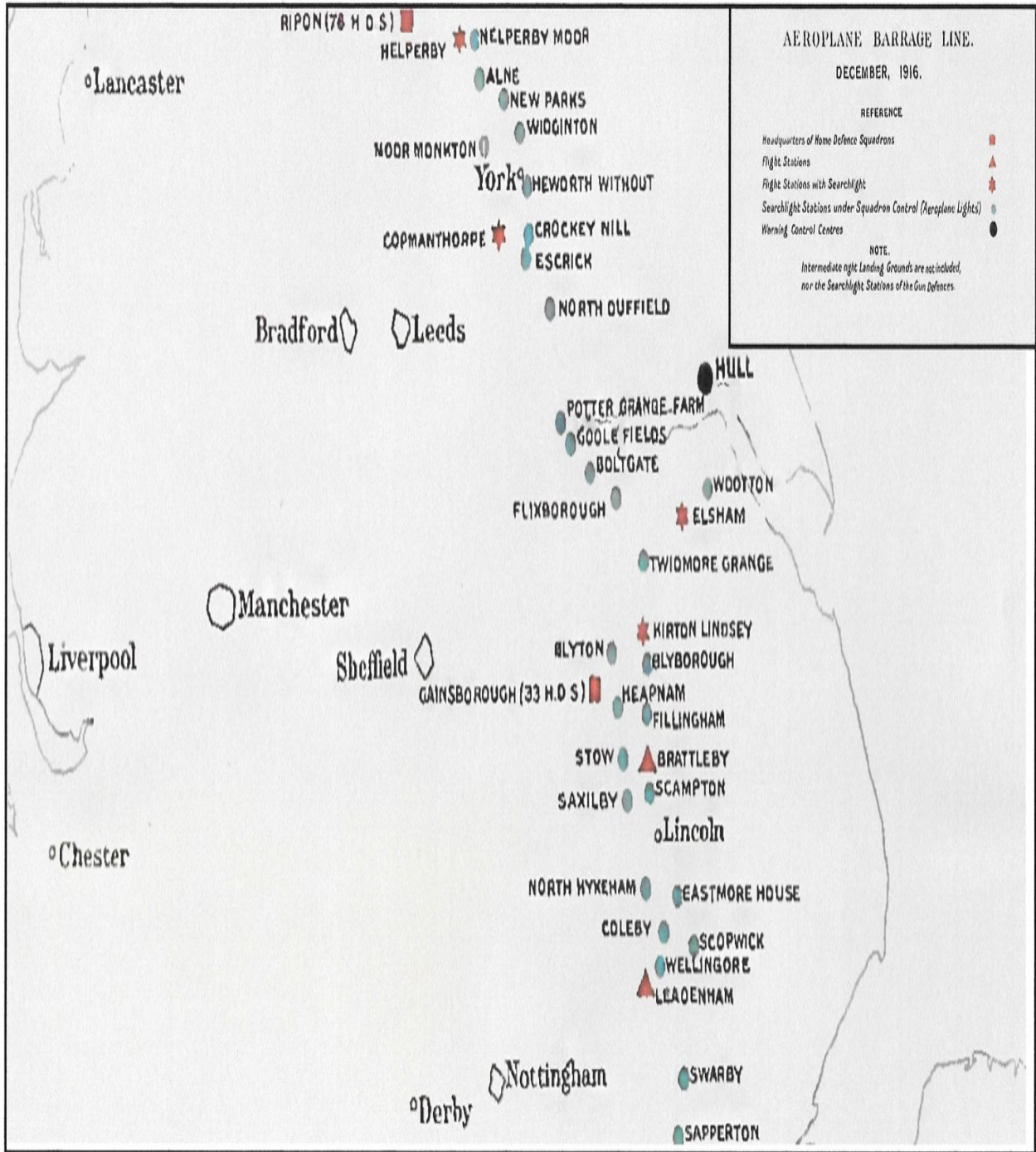
Manton (Kirtan Lindsey)

Gainsborough

Brattleby (Scampton)

LINCOLN

PLANNED AEROPLANE BARRAGE LINE— DECEMBER 1916
(WAR IN THE AIR VOL 111 H A JONES 1931)



Day Two/ Stand One: Gainsborough

No.33 (HD) Squadron RFC Headquarters

October 1916-June 1918

In October 1916 No. 33 (HD) Squadron RFC moved from Yorkshire down to Lincolnshire. The Squadron's Headquarters and Officers' Mess moved from Tadcaster to a large mansion in Gainsborough called 'The Lawn'. The house belonged to the industrialist William Rose, who lived next door at Highfield. Huts were built in the grounds to accommodate clerks, cooks, drivers and other HQ staff. Just across the river an airfield was established on the Saundby marshes, south of the Ramper Road, with workshops to maintain the planes. Part of Gainsborough Workhouse was also taken over to billet Air Mechanics. From 'The Lawns' 33 Sqn HQ was in charge of A Flight at Brattleby (later RAF Scampton), B Flight at Manton (later RAF Kirton in Lindsey) and C Flight at Elsham. Apart from the brick bases of some of the huts there is no trace of the airfield at Gainsborough today, and little evidence of the RFC's presence in the town. One of the hangars from the airfield was dismantled and re-erected on the Southolme, and is in use today as a tyre depot. A thick electricity cable was ploughed up on the site that was traced back to the riverbank and across to Marshall's Power Station on Lea Road, which may have supplied electricity to the airfield.

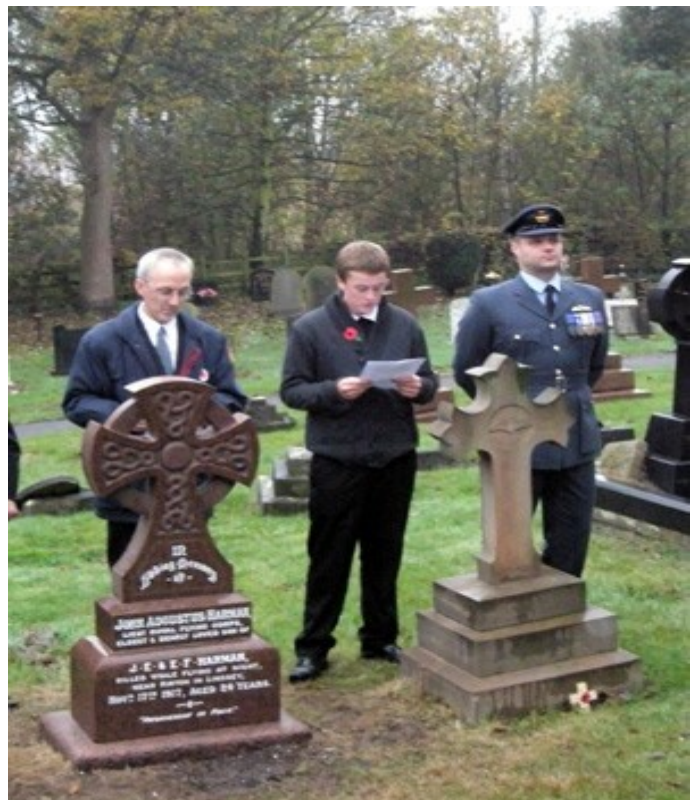
The first powered flight by the Wright brothers had only taken place some thirteen years earlier, on 17 December 1903, so there was huge interest in this new form of transport from the locals, who would walk across the bridge to watch planes taking off. However, the pilot flying the planes trying to find Zeppelins had to fly at night, a new and extremely dangerous skill, and accidents were frequent. Between December 1916 and August 1918 the Squadron lost 14 officers in flying accidents, three of whom were classified as 'war flying casualties' because they were responding to call outs after Zeppelins had been reported crossing the coast. Six of the officers were taken back to their home towns in England and Scotland to be buried, while eight officers were buried in Gainsborough General Cemetery – one from London, Argentina and South Africa, two from New Zealand and three from Canada.

One of the crashes, that of 2nd Lieutenant Hubert Solomon, happened at Gainsborough airfield when he was taking off after being alerted about a Zeppelin raid. Solomon, a New Zealander, was buried in the General Cemetery and the propeller from his F.E.2b was put on his grave as a marker. It appears that it became the custom to mark graves of RFC casualties with the propeller from their plane or present the propeller to

the family. The Menzies family in Canada still have the centre part of the propeller from his F.E.2b, and the Benitz family took the propeller from his Bristol Fighter back to Argentina.

Some of the RFC officers and men who came to the town married local women. One of them, South African 2nd Lt Laurens Jacobus Van Staden, married Emmeline Elizabeth Beilby on 2 February 1918 but was killed just twelve weeks later in a flying accident.

Peter Bradshaw's extensive research into the stories of the 33 Squadron airmen who died while flying in Lincolnshire and were buried in Gainsborough General Cemetery, and the restoration work completed by the Co-op, resulted in the graves and headstones of our eight airmen being fully restored. All of these graves are recognised by the Commonwealth War Graves Commission. Two ceremonies were held to commemorate this work and remember the men who gave their lives, the second ceremony being on Monday 7 November 2012. No. 33 Squadron's representatives that day included the Officer Commanding C Flight, Squadron Leader Stewart Staudinger, a Canadian serving in the RAF. Also in attendance were pupils from Trent Valley Academy and Hillcrest School and the Branch Chairman and Vice-Chairman of the Gainsborough Royal British Legion. The eight airmen buried here are shown overleaf.



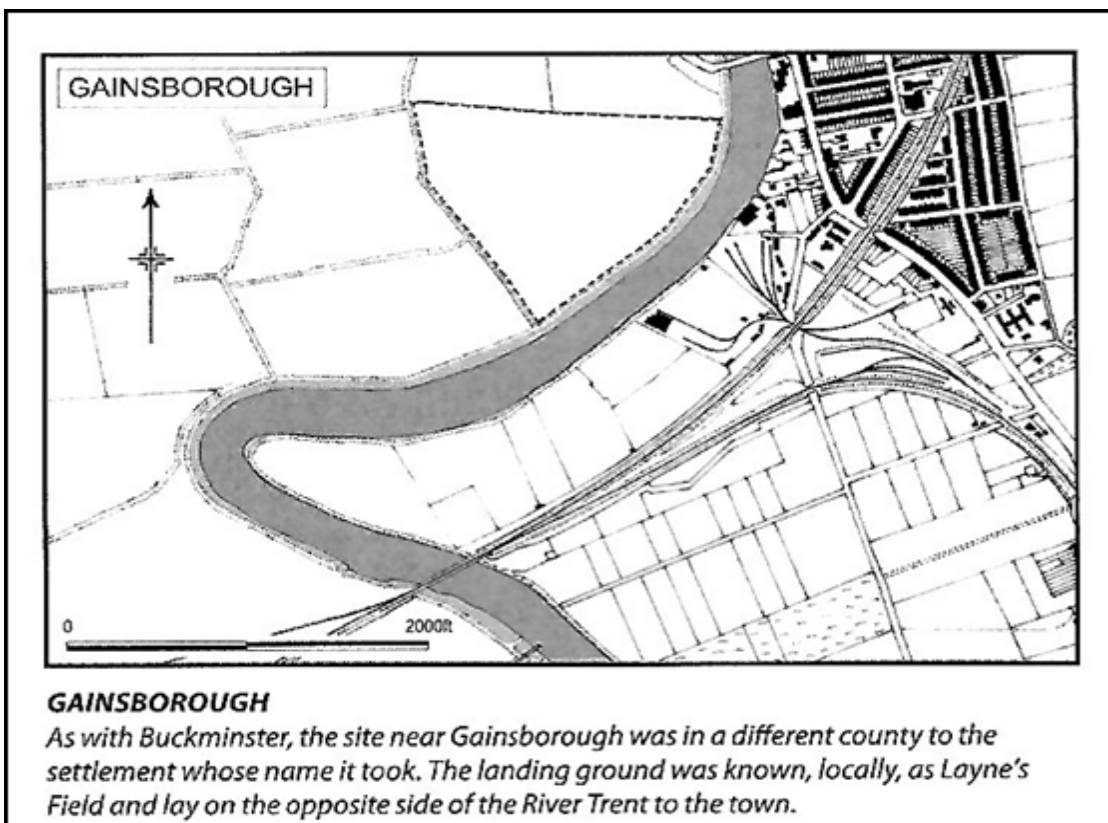
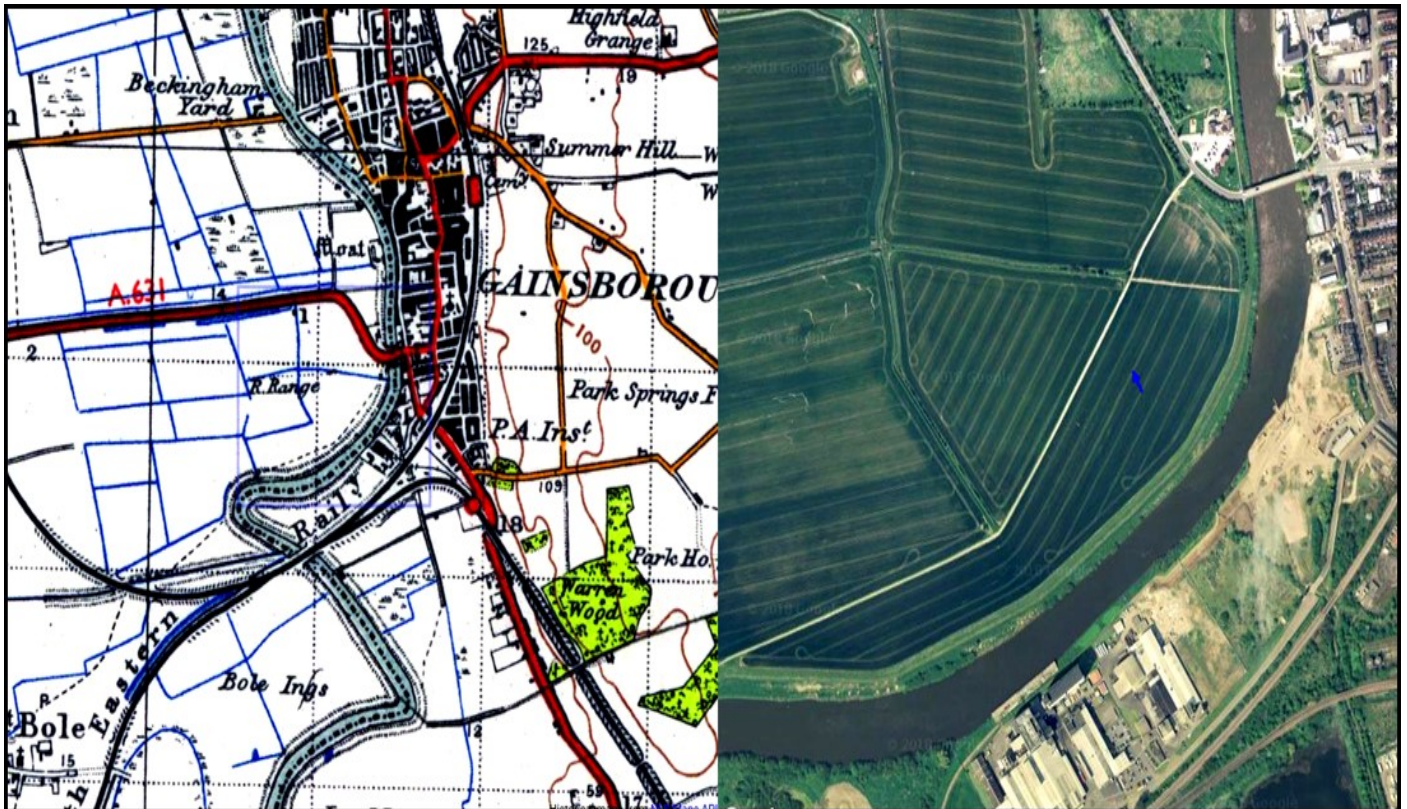
GAINSBOROUGH

104/112: SK 812889 Nottinghamshire (settlement in Lincolnshire) : 30 acres : 20 feet amsl

HD NLG 2nd; re-designated NLG 3rd 31 Mar 17 for 33 (HD) Sqn RFC/RAF Dec 16-Jun 18: it is possible that Marshall & Sons of Gainsborough used this site for some testing of their Bristol F2Bs.

33(HD) Sqn HQ Flt Dec 16, formed with HQ building in the town, moved to Kirton Lindsey Apr 18 Note: the 33 (HD) Sqn HQ building was at The Lawns, Summerhill Road, Gainsborough. The nucleus of 192 Depot Squadron was attached to 33(HD) Sqn at the town HQ Sep 17.

48th Wing, 24 Group, Midland Area, VI Brigade 1918: 16 Group, Midland Area, Nov 18





'The Lawns' on Summer Hill, 33 Squadron's Headquarters in Gainsborough



The view of Newsum's wood yard across the river from the airfield at Gainsborough



Former 33 Squadron aircraft hangar



**Lieutenant John Bernard Brophy, Royal Flying Corps.
Canadian.
Died 24 December 1916, Kirton Lindsey.**



**Lieutenant James Arthur Menzies, Royal Flying Corps.
Canadian.
Died 24 September 1917, Elsham.**



**2nd Lieutenant Hubert Philip Solomon,
Royal Flying Corps. New Zealander.
Died 20 October 1917, Gainsborough.**



**Lieutenant John Augustus Harman, Royal Flying Corps.
English.
Died 17 November 1917, Hibaldstow.**



**2nd Lieutenant Carey Pinnock, Royal Flying Corps.
Canadian.
Died 30 November 1917, Elsham.**



**2nd Lieutenant Frederick James Livingstone,
Royal Flying Corps. New Zealander.
Died 12 January 1918, Scampton.**

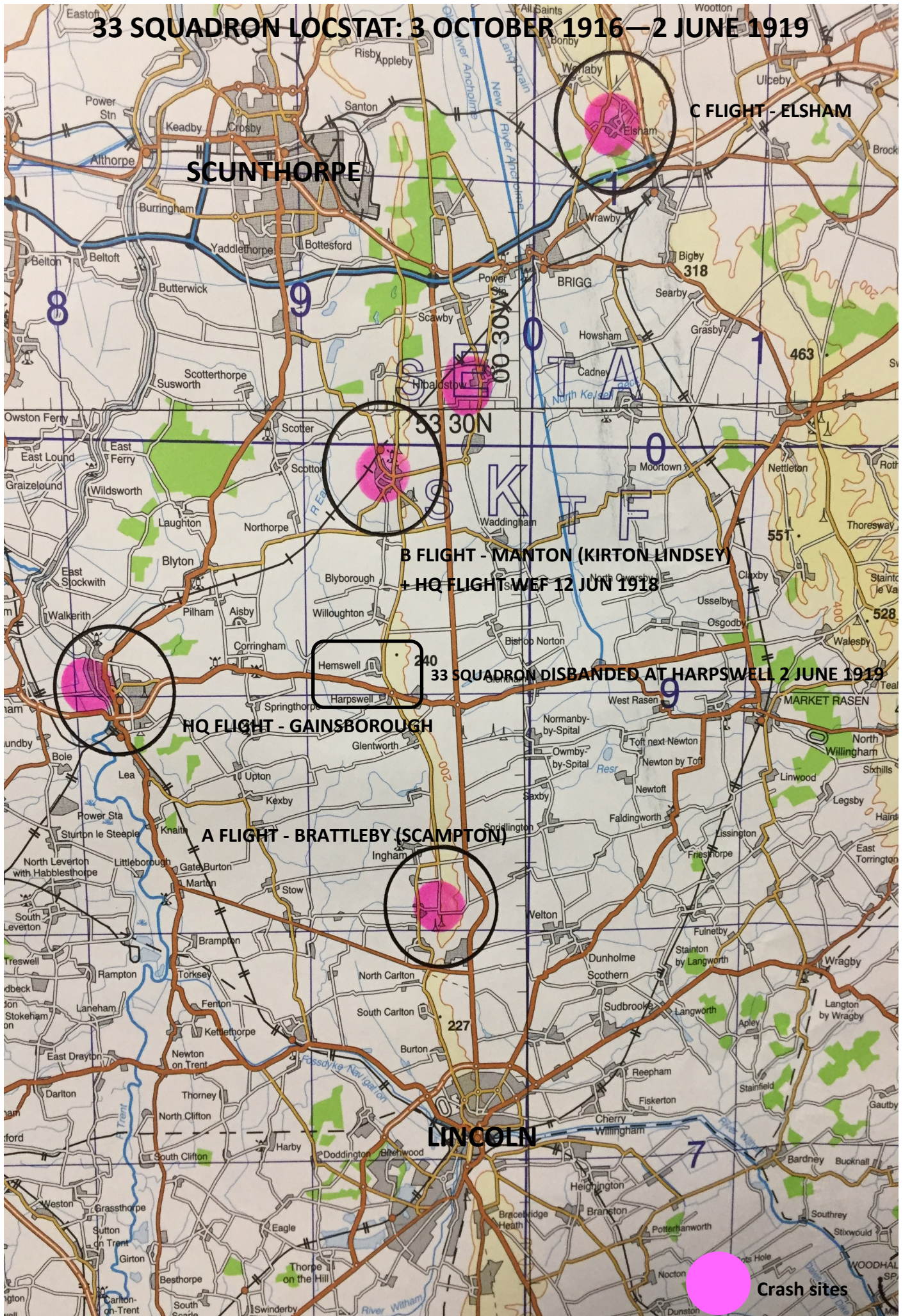


**2nd Lieutenant Laurens Jacoates van Staden,
Royal Air Force. South African.
Died 26 April 1918, Kirton Lindsey.**



**Lieutenant Frank Allyn Benitz, Royal Air Force.
Argentinian.
Died 5 August 1918, Atwick.**

33 SQUADRON LOCSTAT: 3 OCTOBER 1916—2 JUNE 1919



C FLIGHT - ELSHAM

SCUNTHORPE

33 30N

**B FLIGHT - MANTON (KIRTON LINDSEY)
+ HQ FLIGHT WEF 12 JUN 1918**

**Hemswell
Harpwell**

33 SQUADRON DISBANDED AT HARPSWELL 2 JUNE 1919

HQ FLIGHT - GAINSBOROUGH

A FLIGHT - BRATTLBY (SCAMPTON)

LINCOLN

Crash sites

Day Two / Stand Two: Home Defence Flight Station Brattleby

WW2 - RAF Scampton, Home of No.617 Squadron

First World War

Home Defence Flight Station Brattleby (also known as Brattleby Cliff) was opened on the site of the current RAF Scampton in late 1916. The airfield was bounded to the east by Ermine Street, to the south by Pollyplatt Lane, to the west by Middle Street, and to the north by Aisthorpe House. In addition to field boundaries, a number of other features were demolished or used for the airfield, including Aisthorpe House and a farm complex to the east of the site.

The aerodrome covered 287 acres consisting of a landing ground and six single-span end-opening General Service Flight Sheds arranged in pairs with their doors at 90-degrees to the landing ground. Technical buildings were set out behind these, followed by domestic accommodation close to Ermine Street. These were sub-divided into smaller groups depending on rank. Accommodation for women was based around a Women's Hostel.

The first operational unit was A Flight, 33 Squadron RFC which flew FE2bs defending against the Zeppelin threat. The site then developed into a training aerodrome, supporting No. 60 Training Squadron, followed by No. 81 and No. 11 Training Squadrons, flying the Sopwith Camel, Pup and Dolphin. The station was renamed as Scampton in 1917 following which it was designated as 34 Training Depot Station and continued with its operational programme until it was closed in April 1919.

All of the buildings on the airfield were temporary, even the hedgerows and trees which existed around the field boundaries were retained, so that between the wars the area was returned to its previous form. By 1920 all the buildings, including the hangars, had been removed.

Inter-war period

By 1936 the RAF Expansion Scheme had overseen a period of rapid increases both in terms of new squadrons and the development of new stations. The former Brattleby site was one of many earmarked under the expansion programme, situated between three villages; Aisthorpe, Brattleby and Scampton with its main entrance situated on the A15 road (Ermine Street) heading north from Lincoln. The site was to be constructed to the latest specifications and on completion would form a fully equipped Bomber Station. From its reopening in October 1936, the station was to be known as Royal Air Force Station Scampton.

The station consisted of four large C Type hangars with

permanent brick-built technical and domestic buildings. The remaining aerodrome buildings (for technical activities and accommodation) were built in a compact layout behind the hangars, in an arrangement replicated across all of the Expansion Period airfields: Technical Area, Station Offices, Officers' Mess, Sergeants' Mess, Airmen's' Quarters, Married Quarters, and Officers' Married Quarters. Roads were arranged either parallel or perpendicular to Ermine Street with the Guardroom at 90-degrees to the main entrance and the Station Headquarters facing Ermine Street. This resulted in the base occupying an area of 360 acres.

As it developed, RAF Scampton made an increasingly dramatic imposition on the surrounding rural landscape, such as to the Lincolnshire Edge, a Jurassic limestone ridge, which forms the distinctive backbone of the county from Whitton on the Humber Estuary in the north, down to Grantham in the south. Along the top of the Edge a series of airfields were developed, including RAF Waddington, RAF Cranwell and RAF Scampton.

Upon opening IX(B) Squadron and 214 Squadron were the first residents of the station, arriving in October 1936, operating the Handley Page Heyford and Vickers Virginia. IX(B) Squadron stayed at Scampton until March 1938, 214 Squadron having departed for RAF Feltwell in April 1937. Another squadron which was stationed at the base was 148 Squadron formed from C Flt of IX(B) Sqn operating the Hawker Audax and later the Vickers Wellesley. The term of residence of 148 Squadron was brief being replaced by 49 Squadron and 83 Squadron in March 1938. At this time both 49 Squadron and 83 Squadron were operating the Hawker Hind before re-equipping with the Handley Page Hampden.

Second World War

1939-1942

At the outbreak of the Second World War Scampton transferred to No. 5 Group RAF in Bomber Command, playing host to the Hampdens of 49 Squadron and 83 Squadron. On 3 September 1939, six hours after the declaration of war, RAF Scampton launched the first offensive by the Royal Air Force when six Hampdens of 83 Squadron, led by (the then) Flying Officer Guy Gibson and three 49 Squadron Hampdens, one piloted by Flying Officer Roderick Learoyd, were despatched to conduct a sweep off Wilhelmshaven. Further operations involving Scampton's squadrons concerned them with the hazardous task of low level minelaying,

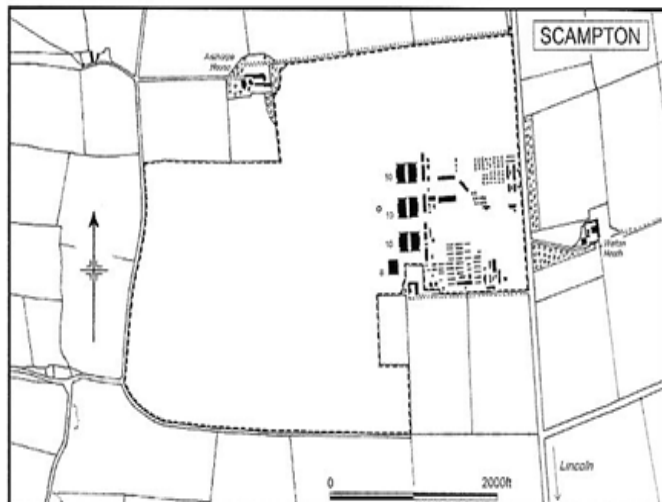
SCAMPTON (BRATTLEBY)

5.5 miles from Lincoln railway station

104/121: SK 957789: Lincolnshire : 287 acres : 1450 yards by 1 000 yards : 200 feet amsl

HD Flight Station RFC/RAF Oct 16-Jun 19: training Squadron Station and training Depot Station RFC/RAF Nov 16-Apr 19.
Relinquishment confirmed 4 Mar 20.

Six 1917 pattern GS Sheds (timber), 170 x 80 feet, plus two HD pattern aeroplane sheds, 140 x 60 feet, as a coupled unit.
33 (HD) Sqn A Flt 3 Oct 16, from Bramham Moor (Tadcaster) until disbanded 13 Jun 19



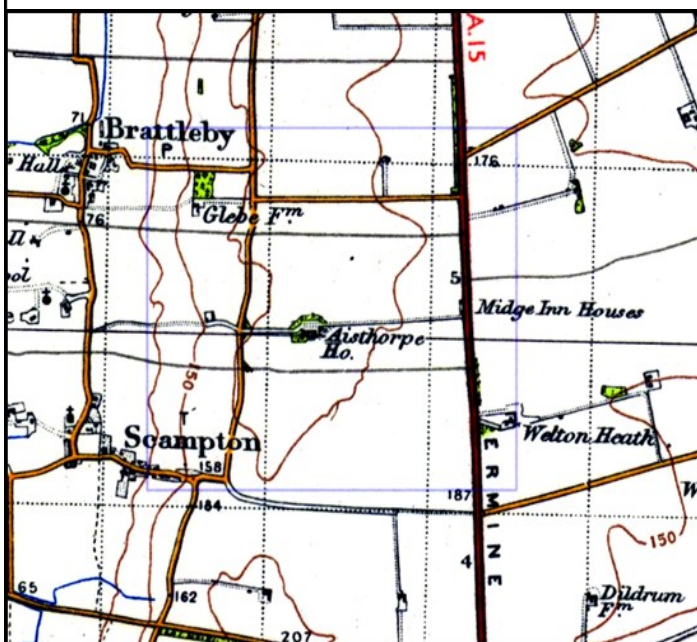
SCAMPTON

This was one of a number of Lincolnshire aerodromes lying alongside the old Roman road, Ermine Street. The main landing area was to the west of the aeroplane sheds and was marked with a landing circle, laid out in chalk.

SCAMPTON

This 1918 view, taken looking north-east across the aerodrome, showing the standard layout for 1917 pattern timber GS sheds, set out as three pairs. The HD sheds can be seen toward the right hand side of the photograph and Ermine Street runs across the background.

:CCI Archive.



33 (HD) Sqn detachment	3.10.1916	Coal Aston	3.10.1916	absorbed into 33 (HD) Sqn A Flt
37 RS/TS	13.11.1916	Catterick	15.9.1917	Spittlegate
49 RS	13.11.1916	Norwich (Household Heath)	14.11.1916	Spittlegate
81 Sqn	15.1.1917	Gosport	4.7.1918	disbanded
60 RS/TS	14.4.1917	Beverley	15.8.1918	disbanded into 34 TDS
11 TS	15.8.1917	Spittlegate	15.8.1918	disbanded into 34 TDS
4 Training Depot Station C Flt nucleus	1.9.1917	formed, attached to 81 Sqn	19.9.1917	Hooton Park
135th Aero Sqn USAS flt*	1.1918	Waddington	27.2.1918	Waddington
34 Training Depot Station	15.8.1918	formed ex 11 TS and 60 TS	5.3.1919	South Carlton and disbanded into 46 TDS
Storage Detachment*	3.1919	formed	1919	disbanded
Care & Maintenance Party*	1919	formed	3.1920	disbanded

Note - the station name was changed from Brattleby to Scampton in 1.1917. The site was re-activated as a bomber station in 1936 and remains open today.

48th Wing (HD), 24 Group, NE Area, VI Brigade 1918 : 23rd Wing, 16 (Training) Group, NE Area 1918

135th Aero Squadron was organised at Rockwell Field, San Diego, California on 1 Aug 17. Towards the end of their training it was alerted for overseas service. In Nov 17 it moved across country to New York and sailed to Britain on 1 Dec, arrived Glasgow 31 Dec, and went by train to Winchester 1 Jan 18. In Winchester Flts were attached to the RFC and sent to Waddington, Scampton and South Carlton. The Flts trained with the RFC from 8 Jan to 24 Jun, reassembled in Winchester on 24 Jun and deployed to France 28 Jun 18. 135th Aero Squadron flew its first combat mission on 7 Aug 18 and its first combat with enemy aircraft took place on 16 Aug 18.

code named 'Gardening', and the bombing of ships. Scampton squadrons were also involved during the critical stages of the late summer and early autumn of 1940, attacking barges in the channel ports which were being assembled as part of the invasion fleet.

For a short time the station was home to the Avro Manchester with 49 Squadron and 83 Squadron operating the type. This was a brief liaison, with the squadrons subsequently converting to the Avro Lancaster. Forming 83 Conversion Flight (CF) on 11 April 1942, which in turn was followed by 49 CF on 16 May, both squadrons were fully equipped with the Lancaster by the end of June. It was during this period that 83 Squadron took delivery of Lancaster MkI R5868 which would one day become the Station's gate guardian.

In turn both resident squadrons were then replaced at Scampton by 57 Squadron. The first departure was that of 83 Squadron which left in August 1942, transferring to RAF Wyton in order to become part of the fledgling Pathfinder Force. This departure resulted in 83 CF moving to RAF Wigsley where it was disbanded into 1654 Heavy Conversion Unit. On 2 January 1943, 49 Squadron departed for RAF Fiskerton with 49 CU disbanding, subsequently becoming 'C' Flight of 1661 Heavy Conversion Unit at RAF Waddington. By early January 1943 this left 57 Squadron as the sole occupier of the base.

The Op Chastise raid against the dams in Germany in May 1943 that was carried out by 617 Squadron from Scampton is covered later in the Handbook. In July 1943 617 was again involved in a precision operation, when twelve aircraft of the squadron took off from Scampton to attack targets in Northern Italy, following which the aircraft continued on to North Africa. The operation met little opposition but the targets were obscured by valley haze and they were not destroyed. The 12 crews returned to Scampton on 25 July from North Africa after bombing Leghorn docks on the return journey. Later in the month nine aircraft took off from Scampton to drop leaflets on Milan, Bologna, Genoa and Turin in Italy. All aircraft completed the mission and again continued onwards to North Africa, where they all landed safely. Seven of the aircraft returned to Scampton on 1 August, one on 5 August and the last on 8 August.

At the end of August 1943, 57 Squadron and 617 Squadron moved to RAF East Kirkby and RAF Coningsby respectively, so that Scampton's runways could be upgraded. With the increased all up weight of the Lancaster it was apparent that the load bearing of hardened runways would be required. The airfield closed at the end of August 1943 for the work to take place re-opening in October 1944. Three concrete runways were laid out in a traditional "A" Class

bomber pattern. The three runways available were: 05/23 at 2,000 yd (1,828.8 m), 01/19 at 1,500 yd (1,371.6 m) and 11/29 at 1,400 yd (1,280.2 m). A total of 11 loop hard standings were laid down along the perimeter track to replace those lost or isolated by the construction. The work also saw new bomb stores constructed on land north of the north-west corner of the airfield. The personnel at Scampton at this time was given as 1,844 males and 268 females. On completion of the required work the area of land which the base occupied had now increased to 580 acres.

Following the work control of the station passed from 5 Group to 1 Group with a new arrival following the upgrade being 1690 Bomber Defence Training Flight (BDTF) which arrived on 13 July 1944. The BDTF consisted of Spitfires, Hurricanes and Martinets, the flight undertaking fighter affiliation against bombers. This unit stayed at the station until September 1944, when it moved to RAF Metheringham. It was replaced by 1687 BDTF which arrived in early December 1944, and departed for RAF Hemswell in April 1945.

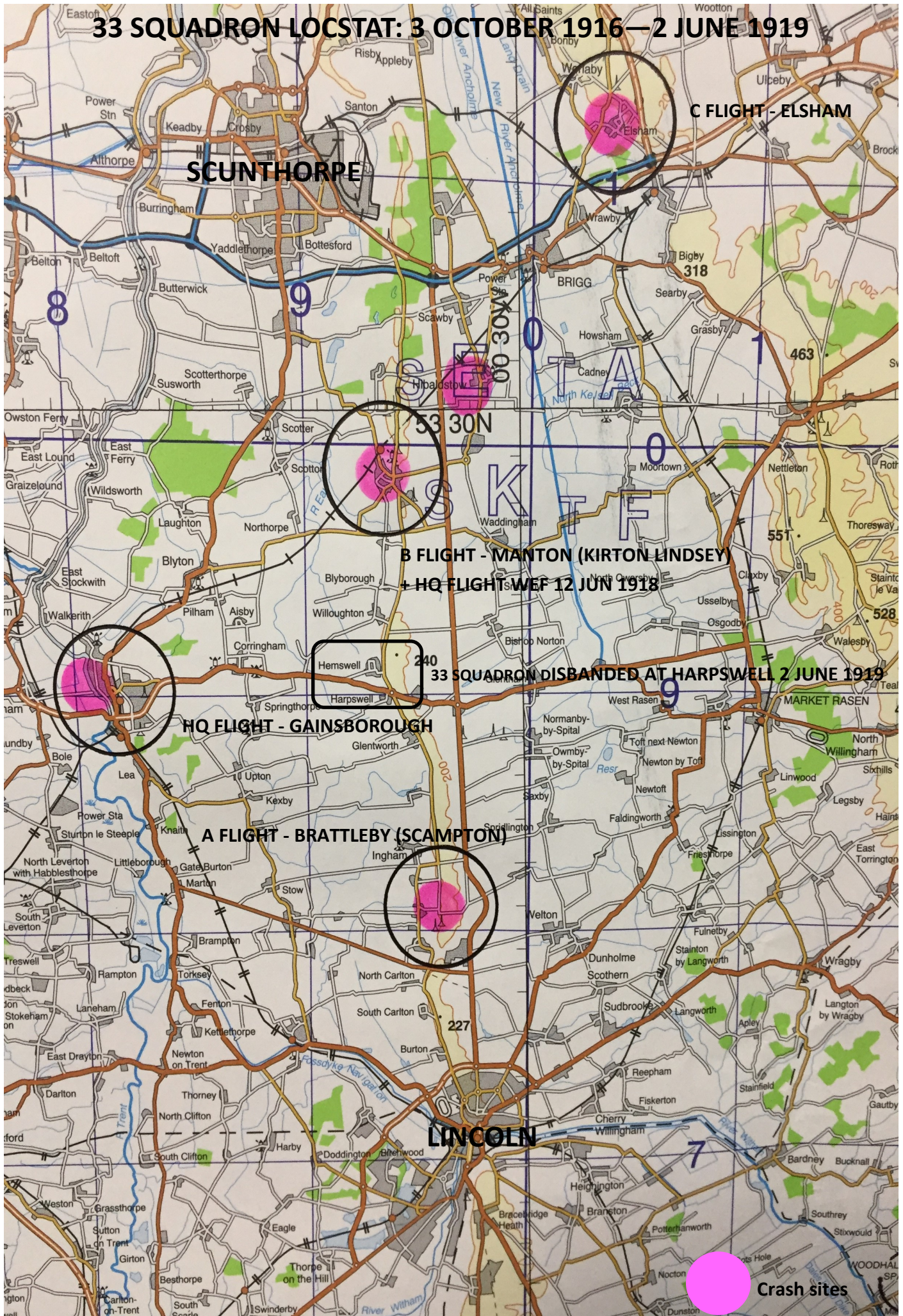
Two Lancaster squadrons, 153 Squadron, and later 625 Squadron, of No. 1 Group RAF also arrived at Scampton following the re-opening of the airfield.

The last bombing mission of the Second World War launched from RAF Scampton was on 25 April 1945, when aircraft from 153 Squadron and 625 Squadron were despatched as part of a raid on the Obersalzberg, the mountainside retreat above Berchtesgaden where Hitler's 'Eagle's Nest' stood.

During the war RAF Scampton lost a total of 551 aircrew and 266 aircraft. Of these 155 were Hampdens and 15 Manchesters. Some 96 Lancasters were lost on operations and accidents from April 1942 to May 1945. The highest losses were those of 57 Squadron, which lost 53 aircraft with 284 aircrew killed, 12 injured and 19 taken prisoner of war. In percentage terms, Operation Chastise was the costliest single raid.

Following the end of hostilities 153 Squadron disbanded on 28 September 1945, followed by 625 Squadron on 7 October. The station continued to operate the Avro Lancaster when 100 Squadron arrived in December 1945. They were to be the last Lancaster squadron on the station, departing for RAF Lindholme in May 1946. Returning to their former home in December 1945, 57 Squadron introduced the Avro Lincoln to the station. In time 57 Squadron also joined 100 Squadron at RAF Lindholme.

33 SQUADRON LOCSTAT: 3 OCTOBER 1916—2 JUNE 1919



C FLIGHT - ELSHAM

SCUNTHORPE

33 30N

**B FLIGHT - MANTON (KIRTON LINDSEY)
+ HQ FLIGHT WEF 12 JUN 1918**

HQ FLIGHT - GAINSBOROUGH

A FLIGHT - BRATTLEBY (SCAMPTON)

33 SQUADRON DISBANDED AT HARPSWELL 2 JUNE 1919

LINCOLN

Crash sites

Day Two/Stand Three: RFC Manton (RAF Kirton in Lindsey)

From the historical point of view, there is some uncertainty about the correct name of the location. Kirton Lindsey or Kirton-in-Lindsey?

It appears to have been an RAF habit (inherited from the RFC) to name its bases after the nearest railway station, possibly to simplify the process of issuing Rail Warrants to personnel posted there. By that token, the site should be RAF Kirton Lindsey, Kirton Lindsey being the name of the nearby railway station constructed in 1849. No.255 Squadron's Operations Record Book (ORB) consistently uses that version of the name. So does the airfield's separate ORB, from the date of the site's WWII creation (15 May 1940) through to May 1941. After mid-1941 and the departure of No.255 Squadron, use of RAF Kirton-in-Lindsey begins to appear in the site's own records – eventually dominating.

First World War

The Royal Flying Corps and later Royal Air Force airfield at Kirton in Lindsey was used during the First World War from December 1916 to June 1919. The airfield was used by detachments of 33 Squadron from nearby Gainsborough, equipped with Bristol Fighters and Avro 504s. With the end of the war, the airfield was returned to agricultural use.

Second World War

The airfield was built on a new site by John Laing & Son in the late 1930s. It opened in May 1940 as a Fighter Command Station covering the NE of England during World War II. Many Defiant and Spitfire Squadrons rested here for a short time during the Battle of Britain.

The airfield was home of Number 71 Squadron of the RAF's Fighter Command. 71 Squadron was composed of mostly Americans and was one of the "Eagle Squadrons" of American volunteers who fought in World War II prior to the American entry into the war. 71 Squadron was assigned the squadron code XR. The squadron arrived at the station in November 1940. By January the squadron was declared combat ready and began flying convoy escort over the North Sea. On 9 April No. 71 was moved to RAF Martlesham Heath.

One of those American volunteers was Bob Mannix, who flew with 71 Sqn between June and September 41. Bob Mannix was posted in as CO 33 Sqn on 31 October 1942 but was killed on 18 November 1942 when his Hurricane II.C (HM154) was shot down by Bf 109s as the squadron was attacking MT south of Benghazi.

Kirton in Lindsey was allocated to the United States Army Air Forces Eighth Air Force in 1942. It was assigned USAAF Station number 349, code "KL".

Beginning in June 1942, the 94th Fighter Squadron of the 1st Fighter Group at RAF Goxhill used the station for training with Lockheed P-38 Lightnings. The squadron remained until October. In October 1942, the 91st Fighter Squadron of the 81st Fighter Group used the station for training. The squadron arrived in Europe from Muroc AAF California flying Bell P-39 Airacobras. The squadron remained until December then departed for French Morocco as part of Twelfth Air Force.

In May 1943, the station was transferred back to RAF control for use as a Fighter Operational Training Unit with Spitfires of 53 OTU from Llandow, Caistor and Hibaldstow used as satellite airfields.

Post War

Kirton in Lindsey remained a front-line RAF base during the Cold War but control of Kirton in Lindsey was transferred to the British Army in 1966. In 2004, the station was returned to RAF control and became the home of No. 1 Air Control Centre (No 1 ACC), a deployable Air Surveillance and Control System, which relocated from RAF Boulmer. In 2012, the technical site was vacated when No 1 ACC moved to RAF Scampton and on 25 March 2013 it was announced the MOD planned to dispose of the airfield and technical facilities with only accommodation remaining, which was emptied later that year. Service Families Accommodation were retained until 2014 when the final occupants vacated and the houses were handed back to Annington Homes who put them on the open market. The technical site was also sold by the MOD in 2014.

KIRTON LINDSEY (MANTON)

1 mile from Kirton Lindsey railway station

104/112: SE 945025: Lincolnshire (Humberside): 119 acres: 1000 x 600 yards: 200 feet amsl.

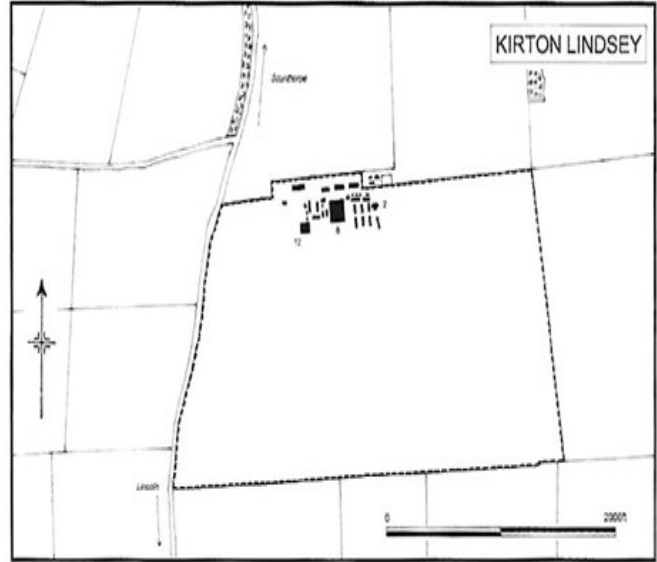
HD Flight Station for 33 (HD) Sqn RFC/RAF Oct 16-Jun 19. Relinquishment notified 6 Nov 19 and confirmed 22 Jan 20.

Two HD pattern aeroplane sheds, 140 x 65 feet, as a coupled unit.



KIRTON LINDSEY

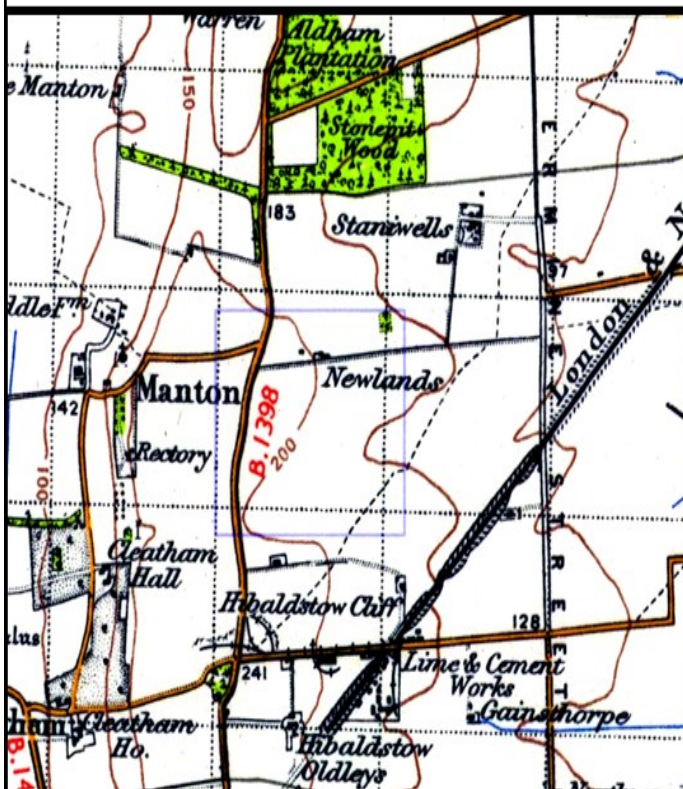
The subject of this photograph was 33 Sqn Avro 504K E3364, with E3366 behind, but it also shows the internal wooden structure of the station's coupled HD pattern flight shed.
:FAAM JMB/GSL 00954



KIRTON LINDSEY

This 33 Sqn Flight Station had typically basic facilities that included a 1912 pattern canvas hangar to house MT. Its site was not that of the WWII fighter aerodrome named RAF Kirton in Lindsey.

33 (HD) Sqn B Flt	3.10.1916	from	Braham Moor	13.6.1919	to	disbanded
33 (HD) Sqn HQ	4.1918		Gainsborough*	13.6.1919		disbanded
33 (HD) Sqn A Flt	13.6.1919		Scampton	13.6.1919		disbanded
33 (HD) Sqn B Flt	13.6.1919		Elsham	13.6.1919		disbanded
48th Wing, 24 Group, NE Area, VI Brigade 1918						



Day Two/Stand Four: RAF Elsham

RAF Elsham is a former Royal Air Force station in Lincolnshire which operated in the First World War and the Second World War. It is located just to the north east of the village of Elsham in north Lincolnshire.

An airfield was established at Elsham as early as December 1916 and used by C Flight of No. 33 Squadron of the Royal Flying Corps, initially operating F.E.2 and later Avro 504 and Bristol F.2 Fighter biplanes. From June 1918 to June 1919 it was also the squadron's headquarters taking over from Gainsborough.

The site was the most northerly of three airfields, along with RAF Kirton in Lindsey (B Flight) and RAF Scampton (A Flight), equally spaced between the cities of Hull and Lincoln for countering Zeppelin night raids. C Flight also acted as observers for the artillery batteries located at Spurn Head and Kilnsea.

Whilst at Elsham 33 Sqn C Flight undertook a number of sorties against the Zeppelins with their FE2 aircraft without success. This was largely due to the height at which the Zeppelins flew, the low rate of climb of fighters at that time plus the absence of radio communications and any sort of ground control. 33 Sqn C Flight sustained 2 fatal crashes flying from Elsham that are known, both in the vicinity of the airfield. "C" Flight departed Elsham in June 1918 and the flying field returned to agriculture. The hanger and most of the wooden huts were demolished in 1919.



**33 Squadron C Flight at Elsham Wolds.
Captain Albert Fanstone AFC seated middle.**

Second World War

In the late 1930s with a new war on the horizon, extra airfields were again needed to accommodate an expansion of the RAF. Former First World War stations were surveyed for suitability, and an area just to the west of the original Elsham site was deemed to be better suited.

Work began in the winter of 1939-1940, and the station opened with the arrival in July 1941 of 103 Squadron. The station was equipped with a main runway 2,000 yards (1,829 m) long, and two subsidiaries of 1,600 yards (1,463 m) and 1,400 yards (1,280 m). Three hangars (two T-2's and one J-Type) and 27 aircraft hardstands (later increased to 36) were built. Three more T-2 hangars were built in 1944. Accommodation for around 2,500 personnel was dispersed in the nearby farmland.

No. 103 is credited with more operational sorties than any other 1 Group squadron, and consequently suffered the group's highest losses. Of the 248 bombers lost on operations flying from Elsham Wolds, 198 were from No. 103 Squadron. By type, losses were 28 Vickers Wellingtons, 12 Halifaxes and 208 Lancasters. One Elsham Wolds Lancaster, Lancaster III ED888 M2 (Mike Squared) which served with both Nos. 103 and 576, held the Bomber Command record for operational sorties, having completed 140 between May 1943 and December 1944. A total of 974 operational hours.

Australian Don Charlwood was a navigator operating out of Elsham Wolds. In his highly regarded memoir, "No Moon Tonight", he writes movingly about his many comrades who died, those that did not (a much smaller number), and about the feelings of aircrews facing such high loss rates. Describing his arrival at Elsham Wolds with a group of 20 other young men, he wrote: ". . . of our twenty only eight were destined to depart . . . a few months later."

Post War

RAF Elsham Wolds closed in 1947 and shortly afterwards DP's (Displaced Persons), Poles and Ukrainians were temporarily housed in the buildings whilst working at the Scunthorpe Steelworks. Some contemplated transit to the US or Canada, others to set roots, mostly in Scunthorpe. Colloquially, it started to be known as "Warsaw Hamlet" and the Post Office delivered letters using that address. By the late 1952 early '53 the DP's had moved on and once again the site reverted to first agricultural, then industrial, use.

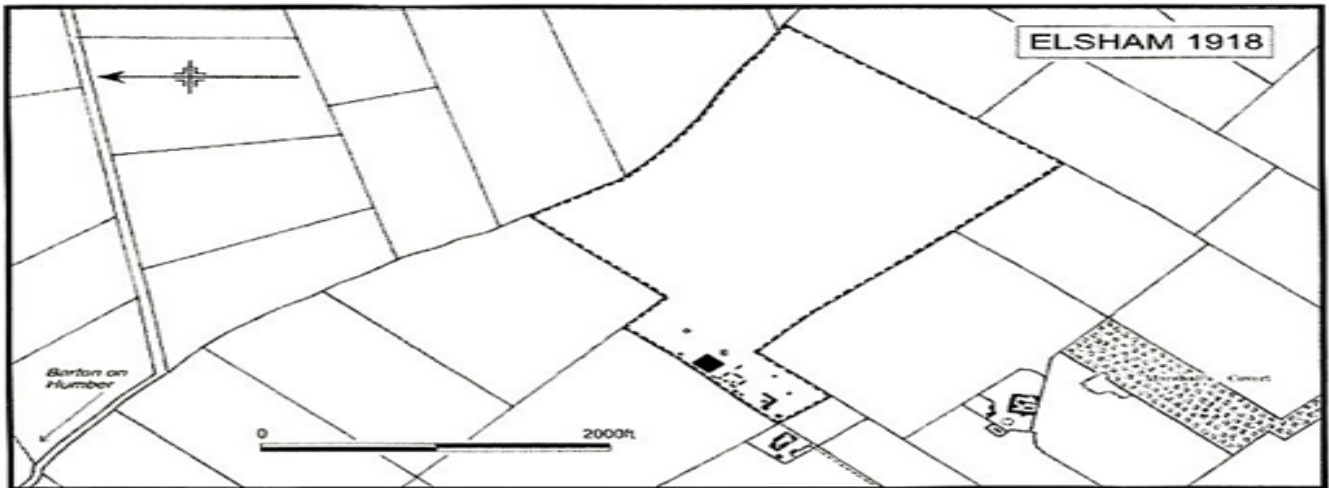
ELSHAM

2.75 miles from Barnetby railway station and 3 miles from Elsham railway station

104/112: TA 056138: Lincolnshire (Humberside): 120 acres: 800 x 600 yards: 210 feet amsl.

HD Flight Station RFC/RAF Oct 16-Jun 19. Relinquishment notified 6 Nov 19 and confirmed 22 Jan 20.

Two HD pattern aeroplane sheds, 130 x 60 feet, as a coupled unit.



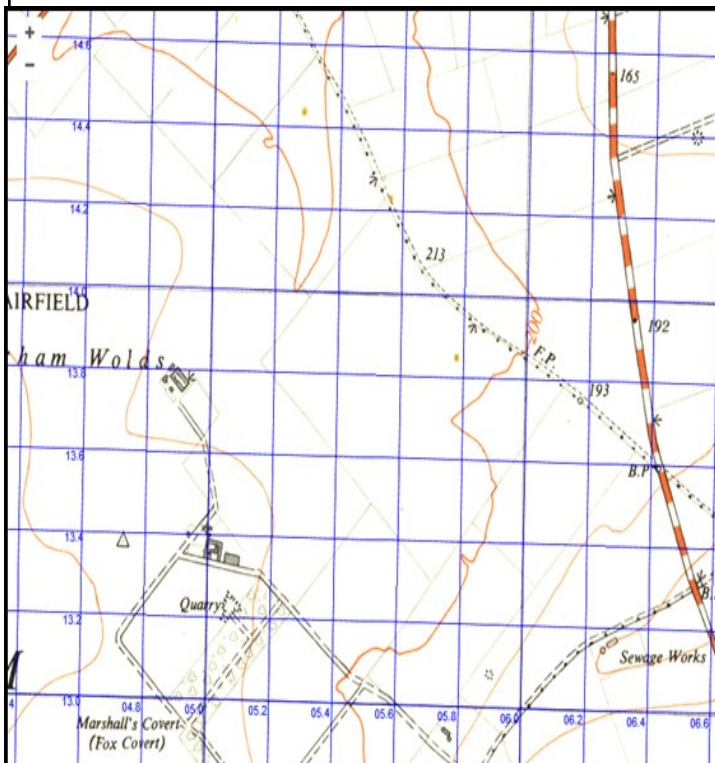
ELSHAM

As with Elmswell, Elsham's facilities were spartan; a small collection of wooden huts that served as offices and workshops. Although the site was not re-activated during WWII, adjacent land was taken up for use as RAF Elsham Wolds, a bomber station.

33 (HD) Sqn C Flt	3.10.1916	from	Beverley	2.6.1919	to	Harpwell
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Note – the site lay outside the boundary of the WW2 aerodrome named Elsham Wolds.

48th Wing, 24 Group, NE Area, VI Brigade 1918 : 16 Group, NE Area 11.1918



Day Two / Stand Five: International Bomber Command Centre

The International Bomber Command Centre (IBCC) is an interpretation centre and memorial relating the historical impact of and on Bomber Command during the Second World War.

Located on Canwick Hill, overlooking the City of Lincoln, the doors opened to the public at the end of January 2018. The official ceremonial opening of the centre was held on the 12th April 2018, as part of RAF100 celebrations

The aim of the IBCC is to tell the personal stories of members of the RAF Bomber Command, ground crew and civilians impacted by the bombing campaigns during the Second World War. The centre also provides a comprehensive record of the role of Bomber Command's squadrons and to digitally display historical documentation and photographs relating to the activity of Bomber Command.

Location

The city of Lincoln was selected for the location of the IBCC because 27 RAF Bomber Command stations (over a third of all Bomber Command stations) were based in the county during World War II. The large amount of airfields led to Lincolnshire being nicknamed the "Bomber County".

The IBCC is just under two and half miles from RAF Waddington, which suffered the greatest losses of any Bomber Command station, and close to the former Avro aircraft production facility at Bracebridge Heath. A view of Lincoln Cathedral, a prominent landmark for aircrews, forms an important part of the vista from the centre of the Memorial Spire.

The Spire Memorial

Within the grounds of the International Bomber Command Centre the Spire Memorial was erected on 10 May 2015 and reflects the connection to Lincoln Cathedral. Created out of Corten, a weathering steel, it is based on the dimensions of the wingspan of a Lancaster bomber, being 102 ft (31.09 m) high and 16 ft (5 m) at the base. The Spire was officially unveiled in October 2015 to an audience of 3,600 guests including 312 Bomber veterans.

The spire is encircled by walls carrying the names of all 57,871 men and women who gave their lives whilst serving in or supporting Bomber Command. This is the only place in the world where all these losses are memorialised.

The Chadwick Centre

Named after Roy Chadwick, the designer of the

Lancaster Bomber, the IBCC includes an education suite, an interactive and immersive exhibition across three galleries, reference library, visitor facilities and a research room. The centre will relate the experiences of service personnel in Bomber Command and the effects of bombing on civilian populations. The centre will also cover both the war time and post-war review of the bombing campaigns undertaken during the Second World War.

The centre has already collected over 800 personal experiences of Bomber Command veterans from around the world, as well as from civilians impacted by the bombing campaigns and civilians recording the impact on Lincolnshire of having so many RAF personnel arrive.

The Peace Gardens

These include a Memorial Avenue as part of the Lincolnshire Peace Garden, with geo-located trees for each of the 27 Lincolnshire stations, an International Garden with planting beds representing the 5 continents and 62 nations involved with the Command, an amphitheatre for outdoor education and areas of sensory planting. The Peace Gardens incorporate a Ribbon of Remembrance which enables families, Associations and nations to mark those who served. Created out of laser cut Yorkshire Scoutmoor stone, the Ribbon will provide a moving and personal tribute to those involved.

Day Two/ Stand Six: Petwood Hotel, Woodhall Spa



In his book 'Enemy Coast Ahead', written in early 1944, Guy Gibson offers the reader his recollections of the outbreak of World War Two. On 31 August 1939, the day that Poland supposedly rejected Germany's ultimatum regarding Danzig and the Polish Corridor to East Prussia, Guy Gibson was sat at Monkstone Beach in Pembrokeshire. He was enjoying a hot summer's day when he received an urgent telegram that said simply, "Return to Unit immediately." Two hours later, with a friend from Oxford, they were in a 1928 Alvis heading back to Oxford via Carmarthen, Brecon, Hereford and Stratford on Avon, passing great queues for petrol outside filling-up stations and cars packed with luggage and families. Gibson had joined the RAF in 1936; by 1939 he was a Flying Officer and a Handley Page Hampden pilot with No.83 (Bomber) Squadron, based at RAF Scampton.

Although he is probably one of the best known RAF pilots from World War Two, Gibson wrote: " I was no serviceman: I joined the Air Force in 1936 purely to learn to fly. I was due to leave the RAF to become a test-pilot – a good job with plenty of money in it, but Mussolini put paid to that when he invaded Albania. Now Hitler had ruined my summer leave...That England was unprepared there was no doubt. Although the Navy talked about the big blockade which would bring Germany to her knees in six months, although the lion had wings, what were the facts? We had very few bombers, mostly Wellingtons, Hampdens and, perhaps best of all, the good old Whitleys. None of these could find carry many bombs and only a few could even find

their targets. Navigation was at a very low ebb. Our fighters were mostly Gladiators and Mark I Hurricanes and a squadron of Spitfires. Typhoons and Lancasters were but twinkles in their designer's eyes.... My thoughts were interrupted as we rumbled down Woodstock Road, past my old school, St.Edward's, into Oxford. Freddy drew up in front of a pub and we went in to have a quick one. We left after the twelfth can, feeling much better, and went to have dinner. It was fairly late and we were pretty hungry, and fed like kings with some excellent 1928 burgundy. Then, after a few more drinks I was literally poured into the train.

What a journey! The train had been blacked out. It was completely packed with soldiers and civilians. After many stops, with my hangover getting steadily worse, we arrived at Lincoln at 4.00 am. After much trouble and signing of a couple of forms, I was taken by transport to Scampton. Sunny Scampton we call it because it is in Lincolnshire and doesn't see much sun up there. It's a fine old Bomber base dating from the last war, but as we drove in through the gates I saw that the windows had been blacked out and that the street lighting had been switched off. In the Officers' Mess there was a dim sinister blue light. As I was having my breakfast and about to go to bed all the boys came in. Normally there is no one about in an RAF Officers' Mess at 6 o'clock in the morning, but this was different. They had been standing by since dawn. They had not changed; they were cheerful in their greetings. But a little later there was silence when we heard that Germany at dawn that morning had invaded Poland,

and I went to bed.” On 3 September Gibson was one of the pilots selected to attack the German fleet near Wilhelmshaven. The aircraft took off at 18.15 but the operation was aborted due to bad weather and he landed back at Scampton around 23.00.

Further in the book there is an interesting story that highlights the level of RAF navigational awareness in 1940 in contrast to the level of accurate night navigation and flying that would be required three years later in order to carry out the daring Op Chastise raid:

“There is an entry in my log book which reads: “June 13, 1940 – Hampden L.4070 – pilot: self and crew – duty: bombing Ghent and England (nearly): time 7.15 hours.”

This was one of those occasions when you nearly put your foot in it, but not quite. We were returning from a mission which involved the bombing of a German military headquarters at Ghent at dawn. Usually in these cases we used to set course from a target in a south-westerly direction, so as to arrive over Unoccupied France in daylight where there wouldn't be any air opposition. Often on these trips you could see the confusion of the refugees packing the roads, trudging their lonely way towards the south coast. When we had arrived at a safe spot in this unoccupied area we would then set course direct to England.

On this occasion, however, we arrived a little early and Watty thought he could make it direct with the hours of darkness available. So we set course straight to base i.e. north-west. Soon we ran into low cloud and after a while passed over a concentration of heavy guns and searchlights. We thought that this must have been Dunkirk and we then turned due west. As daylight came we got closer and closer to the ground, every eye looking in all directions for enemy fighters. We thought we were still over France and there was still no sign of the French coast coming up. When it was quite light we began to distrust our compass and turned north-west, steering as far as we could judge by the sun. By now we were flying right down amongst the trees, everyone on board completely scared stiff. Suddenly an aerodrome loomed up in front, and I opened my bomb doors in desperation. If I was to be forced down amongst the Hun the last thing I could do whilst still flying was to bomb a hangar, and we still had one bomb left. Just as my finger was playing with the button I thought I recognized the field. Yes, no doubt about it now. This was Harwell and this was England. I slammed the bomb doors shut and quickly turned on to a new course. After an hour we arrived at base to find that we were exactly three hours overdue. Most people thought we had had it.”

The Petwood Hotel

The hotel building served as a military hospital for injured soldiers during the Great War, but it is best known as the home of the legendary RAF's 617 'Dambusters' Squadron in World War Two. Occupied from 1942, it was originally home to officers of No. 97 and No. 619 squadrons, but with nearby Woodhall Airfield chosen as the operational base, 619 moved away and the officers of 617 moved in.

Composed of Canadian, New Zealand and Australian as well as British Air Force personnel, 617 was entrusted with the task of crippling. Carried out on 16-17 May 1943, Operation CHASTISE utilised the ingenious 'Upkeep' bomb designed by Barnes Wallis to breach the Sorpe, Eder and Möhne German dams in the Ruhr. The Squadron's badge, picturing a breached wall, and motto, "Après moi, le deluge" ("After me, the flood") paid homage to the deadly effectiveness of the mission.

Today, the Squadron Bar hosts a range of memorabilia and tributes to Guy Gibson VC, Leonard Cheshire VC and their officers. Petwood was a scene of some jubilant celebrations with the breakthroughs made by 617, as well as tragic losses. Of the 19 Lancasters that left Scampton, eight failed to return. Of the 133 aircrew who went on the raid, 53 were killed and three bailed out to be made POWs. After the raid, on 22 June 1943, thirty-three of the surviving aircrew were decorated at Buckingham Palace. Wing Commander Gibson was awarded the Victoria Cross, becoming Scampton's third recipient of the award, and in total there was one VC, five DSOs, ten DFCs and four bars, twelve DFMs and two CGMs presented to Dambusters that day.

The Squadron's feats live on at the Petwood, which remains a fascinating testament to the Dambusters. Besides the attacks that destroyed two key dams in the Ruhr area of Germany, the Squadron also used cutting edge 'Earthquake' bombs to score critical hits on the warship *Tirpitz*, and various other key targets including bridges, shelters and canals. In 2010 it was also uncovered that they were being considered for a special mission to target Mussolini himself.

The Squadron Bar is open to the public most of the time and, although not an operational bar, guests are welcome to raise a glass and dine in there, being available for private dining for up to 16 guests. If anyone wishes to make a special visit to see the Squadron Bar and view the memorabilia, call ahead to check that it is available for viewing.

Day Three / Stand One: Newark Air Museum

Background

Newark Air Museum secured its first airframe in 1963 and after going through the formalities of Company and Charity registration the Museum officially opened to the public on Saturday 14 April 1973 on the site of a former World War II training base, RAF Winthorpe.

The museum opened its first Aircraft Display Hall to the public at Easter 1990, with 1,860 square metres of space. With an eye on the museum's long-term future trustees instigated negotiations to buy farmland on the museum's southern boundary in 1994, and completed the purchase of 5.01 hectares of farmland by Christmas 1995.

In November 2004 the Museum opened its second Aircraft Display Hall to the public, having run an extremely successful project in conjunction with the Heritage Lottery Fund. Newark Air Museum is one of the largest volunteer managed aviation museums in Great Britain and is open 361 days a year, except for Christmas Eve, Christmas Day, Boxing Day and New Year's Day.

Collection

The Museum website lists 86 aircraft on its inventory, and will climb to 88 with the addition of its latest purchases - an Aerospatiale Puma and a Boeing Chinook. The Puma, known to many of us as XW 208 or 'CE', arrived at the museum on Wednesday 7 February 2018 from nearby RAF Cranwell, Lincolnshire. Although the airframe was incomplete it represented a starting point for what is believed to be one of the first RAF examples of the type to go on display at an air museum on the UK mainland; XW 222 is on display at the Ulster Aviation Society's site at Maze Long Kesh, outside Lisburn. based museum. The Museum first made an attempt to secure a Puma for its collection back in 2011.

My first flight in XW 208 was on 28 Oct 1982, a month after I joined 33 Squadron over at 'RAF Long Sutton'. It was a 5 minute 'TACEVAL deployment' deployment from Odiham over to the Gurkhas for a 'baat' at the Queen Elizabeth Barracks at Church Crookham, where we would sit for the day while the TACEVAL team evaluated the rest of the station. Another 138 sorties

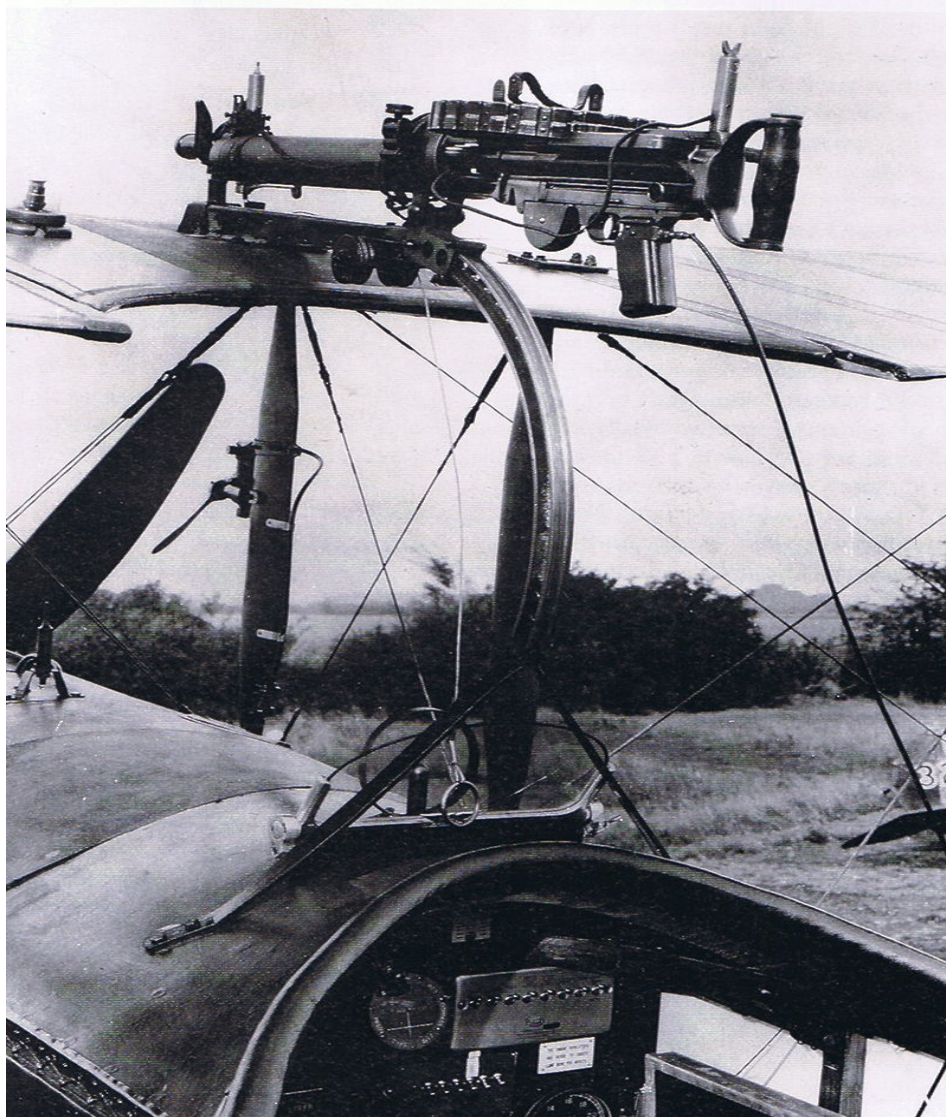
in CE appear in my logbooks, the last being a flight on 24 Feb 00 during my Puma refresher course on the Puma OCF at Benson, a 1hr 20 min trip to Luton and back. I flew a total of 247hrs 35 in CE, about 10% of those hours were at night, and only once was a task cut short due to technical problems, that was a Freefall Para task in Belize in Aug 84 when, just after one jump had taken place, we had a No.2 Engine problem and had to abort the sortie. I flew in CE with 55 different pilots, on 33 Sqn and 230 Sqn, in Norway with the AMF and in Belize. Apart from the usual BSE, TST, IFE and NFE training, and a number of air tests, we did JATE trials and Abseil Instructor training at Brize Norton, Abseiling Displays and troop moves around Bardufoss; deployments to Belmopan, the weekly BGS runs to Rideau, Ex MAYAN SWORD and the San Pedro / Cay Chapel 'standby' in Belize; MEDEVAC, Op MONOCLE, Ex GOLDEN BLADE, RHINOS CHARGE and several 6 Brigade moves and Puma air displays in Germany. We even flew a number of S&D tasks in her in 1994.

The Museum raised £2,500 to move the fuselage of the Chinook HC.1 from RAF Cranwell to Newark. Due to the size of the 'cab' a specialist company was employed to load and complete the move whilst complying with various transport regulations; and then off-load the 'cab' at the museum site. This unique exhibit is ZA717 'BV', which was written-off in a non-fatal incident at RAF Mount Pleasant, Falkland Islands on 25 July 1989. The Chinook fuselage was delivered to the museum on Thursday 22 February 2018 and I think we can expect a short brief from our guide, Chris Perkins, who ran the Air Loadmaster Training School at Cranwell and arranged for these aircraft to be delivered to his inventory in order to provide realistic Loadmaster training to budding helicopter crewmen before they progressed to their front line OCU's and squadrons.

Appendices



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Foster-mounted Lewis machine gun on Avro 504K

Appendix 1: No. 33 (Home Defence) Squadron, Royal Flying Corps

From the National Archives, Kew

On the 31st December 1915 instructions were issued that the nucleus of No. 33 Squadron should be formed immediately to take over the training duties of No. 20 Squadron.

The squadron was formed in the 4th Wing of the V Brigade, at Filton, Bristol on the 12th of January 1916 from the surplus personnel of No.20 Squadron which was proceeding overseas on the 16th January.

It was first commanded by Major P.B. Joubert de la Ferté who was posted to the squadron from the date of its formation, and by the 21st January the following officers had been posted to the squadron:-

2nd Lieutenant J.E.Evans

2nd Lieutenant P.B. Prothero

2nd Lieutenant E.R.N. Hyde

2nd Lieutenant C.I. Carryer

2nd Lieutenant L.W. Hall

2nd Lieutenant J.S.D.H. Jones

In addition there were twelve officers with the squadron who were undergoing instruction in flying and observation.

At this period the reorganisation of the anti-aircraft defences of Great Britain was under discussion which resulted in the following decisions as regards to the responsibility for anti-aircraft defence being given to the War Committee in February 1916.

(a) The Navy to undertake to deal with all hostile aircraft attempting to reach this country, whilst the Army undertake to deal with such aircraft which reach these shores.

(b) All defence arrangements on land to be undertaken by the Army, which will also provide the aeroplanes required to work with Home Defence troops and to protect garrisons and vulnerable areas, and the Flying Stations required to enable their aircraft to undertake these duties.

(c) The Navy to provide aircraft required to co-operate with and assist their Fleets and Coast Patrol flotillas and to patrol the coast and to organise and maintain such Flying Stations as are required to undertake these duties.

The two Services were to co-operate so as to prevent unnecessary duplication.

As a result of the foregoing decisions the defence of London was taken over by the Army on the 16th February, and soon after the rest of the country.

In March, the aircraft establishment for Home Defence was laid down as ten squadrons and No.33 Squadron which was formed originally as a Service squadron was amongst the first squadrons to be specially allotted for this duty under the new scheme, becoming No. 33 Home Defence Squadron on the 18th March 1916.

On the 6th April the defence of Leeds and Sheffield, two important munition producing areas, was allocated to the squadron, which for this purpose moved a few days later from Bristol to Knavesmire, York, where it came under the administration of the 8th Wing. By the 20th April, the Headquarters of the Squadron had moved to Headley Bar, Tadcaster, and the squadron had opened up a new Station at Bramham Moor.

Owing to the shortage of trained night-flying pilots it was not possible to complete the establishment of the squadron in personnel which at the time of the move consisted of :-

Major P.B. Joubert de la Ferté (Squadron Commander)

Captain H.S. Walker (Flight Commander)

Lieutenant J.S. Beatty

2nd Second Lieutenant A.M. Lowery

2nd Lieutenant C.I. Carryer

Captain W. Wade (Assistant Equipment Officer).

There were in addition twelve officers, one flight sergeant and one air mechanic undergoing instruction.

Furthermore the establishment of aeroplanes was limited to four B.E.2.c's (R.A.F.1 engines), of which one could be used for the final qualification of advanced pupils. Pilots who were specially earmarked for home defence work were given as much flying practice as possible on the home defence aeroplanes so long as the serviceable aeroplanes did not fall below two. Bomb and dart dropping practice was also carried out under local arrangements.

The scale of armament and equipment to be carried by a B.E.2.c. was laid down as:-

No passenger.

Either four H.E. bombs with disc nose-pieces or one box of Ranken darts.

Lewis guns fitted so that the pilot could fire upwards through the middle bay.

Wing flares.

Navigation lights.

On arrival at their new station the squadron was allotted one B.E.2.c (90H.P. R.A.F.1 engine) from No.36 (H.D.) Squadron at Cramlington, and three of the same type from No.34 (H.D.) Squadron at Castle Bromwich. Pending the receipt of these aeroplane the squadron used B.E.2.c's with the 80 H.P. Renault engine.

The principle governing the action of these defence machines was that on receipt of warning that an attack was definitely expected, one machine from each station should be sent up to patrol over its own landing ground at a height of from 8,000 to 10,000 feet. The patrol was normally for two hours duration; a second machine being sent up after one and half hours to ensure continuity of the patrol.

The squadron was soon called upon to take action against enemy air raiders. On the night of 2nd/3rd May 1916 five hostile Airships crossed the coast between Saltburn-by-the-Sea and Scarborough between 9.15 p.m. and 10.50 p.m. One, the L.21 came inland at Cloughton, north of Scarborough at 9.40 p.m., and steered a direct course for York. After releasing eighteen bombs on Dringhouses, she reached and began to bomb York at 10.40 p.m. In a ten minute attack, sixteen bombs were dropped along a line across the southern and eastern part of the city. Eighteen dwelling houses were destroyed and many others considerably damaged. One incendiary bomb fell on the squadron's landing ground at the Knavesmire, but did no damage. However, after the raid the inhabitants raised such a protest against the night landing lights being in such close proximity to York that Knavesmire landing ground was closed. Copmanthorpe, some five miles south-west of York, was taken up in its place.

At 6 p.m. on the 2nd No.33 Squadron received the general warning that hostile aircraft were approaching the Yorkshire coast. At 8.45 p.m. information was received from the Anti-aircraft Defence Commander Leeds that Zeppelins were about 30 miles away. At 10.30 p.m. further information from Leeds stated that a Zeppelin was reported a short distance north of Ripon. Thereupon, after some slight delay due to difficulty starting the engine, the Squadron Commander Major Joubert de la Ferté ascended from Bramham Moor at 10.40 p.m., followed by Captain T.W.P.L. Challoner at 10.45 p.m. Both officers patrolled round the north of Leeds from Dunkeswick to Seacroft, as an attack was expected from this direction. Major Joubert de la Ferté landed at 11.45 p.m. and Captain Challoner some 20 minutes later. The Squadron Commander ascended again at 12.10 a.m. but owing to low clouds after a

patrol of half an hour. Neither officer saw a raider.

A general scheme for the defence of Great Britain, which had been prepared by General Headquarters, Home Forces, was issued during May. Under this scheme the squadrons allotted for home defence were reduced from ten to eight. No.33 (H.D.) Squadron became responsible for the defence of the Humber in addition to Leeds and Sheffield, and in order to carry out this additional duty the following establishment and distribution of the squadron was decided upon. (see Table 1).

Table 1. No.33 (H.D.) Squadron Establishment

Location	Aeroplanes	Mobile Searchlights	Defending
HQ Flight Beverley	10 - includes 2 scouts	4	Humber
1 x Flight Bramham Moor	4	2	Leeds
1 x Flight Coal Aston	4	2	Sheffield

Footnote: Searchlights. Experience had proven that the employment of aeroplanes at night unassisted by searchlights was impracticable and that the provision of searchlights for co-operation with the defending machines was essential. The searchlight detachments were at the disposal of the Officer Commanding, Royal Flying Corps, at their particular station, who issued instructions to the Officer Commanding Searchlights as to their tactical disposition and employment.

Of the establishment shown in Table 1. there were actually with the squadron at this time the aircraft listed in Table 2. This increase in establishment was to be gradually made up as and when machines became available, but owing to the demands for aeroplanes for overseas and the consequent shortage of machines for home defence, the establishment to which the squadron was to be increased, was on the 31st May temporarily limited to:-

Beverley	6 B.E.'s and 2 Bristol Scouts.
Bramham Moor	4 B.E.'s
Coal Aston	2 B.E.'s

	Aeroplanes	Mobile
Bramham Moor	4 B.E.2.c's	2
Beverley	1 B.E.12	2
Doncaster	1 B.E.12	2

Table 2. No.33 (H.D.) Squadron Strength.

On the revision of the allotment of defended areas, No.47 (H.D.) Squadron which had hitherto been responsible for the defence of the Humber, handed over to No.33 (H.D.) Squadron in the middle of June, two half-flights stationed at Beverley and Doncaster, and by the 24th June No.33 (H.D.) Squadron had flights at Beverley, Bramham Moor and Coal Aston, and had on charge six B.E.2.c's and three B.E.12's.

The following Night Landing Grounds had been allotted to the flights:-

Flight Station	Defended Area	Landing Ground
Beverley	Humber	Atwick Pocklington Bellasize South Cave Winterton Goxhill Hedon North Coat Fitties
Bramham Moor	Leeds	Dunkeswick Seacroft Pontefract Cullingworth Farsley Middleton Helperby
Coal Aston	Sheffield	East Retford Brampton Redmires Ecclesfield Thorne

Authority for the issue of information, instructions and operation orders was vested in the Garrison Commander, Humber, and the Anti-Aircraft Defence Commanders of Leeds and Sheffield, but as it was impossible for anyone except an officer on the spot to judge the local meteorological conditions, the senior R.F.C. Officer at each station was solely responsible for ordering machines into the air, and was empowered to

use his full discretion as to the likelihood of the weather rendering offensive action not only unsuccessful but unduly costly in life and material.

In addition to defence duties the squadron was to be utilised during the day for the advanced training of personnel for overseas, and it was decided that 50% of the Home Defence aeroplanes could be used for this purpose provided that at least half the defence machines were always in a fit condition for night flying.

This scheme of combining home defence duties with advanced training did not prove successful however, mainly due to the fact that aeroplanes which had been used for training during the day although serviceable at night could not be maintained at that standard of efficiency which was so essential to night flying. As a result a scheme was drawn up and approved on the 24th June for the immediate placing of Home Defence Squadrons on a basis separate from training.

A new Defence Wing, at first known as the 16th Wing and later as the Home Defence Wing was formed under the command of Lieutenant-Colonel F.V. Holt to administer all the Home Defence Squadrons, which were now temporarily reduced from eight to six, owing to urgent demands from overseas and the fact that a 'close' season for airship raids might be expected during the short summer nights. This Wing although formed with effect from the 25th June did not actually come into being until the 7th July; between that date and the 14th July, No. 33 (H.D.) Squadron together with Nos. 36, 38, 39, 50 and 51 Home Defence Squadrons were transferred to the new Wing, No. 33 (H.D.) Squadron handing over its training aeroplanes to No. 57 Squadron, for the formation of which it had supplied the nucleus in May.

Generally, for all tactical operations the Wing came under the orders of General Headquarters, Home Forces, to whom the Wing Commander was responsible for the tactical efficiency of his squadrons. The squadrons came under the immediate orders of their local Defence Commanders, subject to any temporary redistribution or changes in stations for tactical reasons which might be decided upon by General Headquarters, Home Forces.

During the period of this re-organisation the squadron experienced various changes in Commanding Officers. Major F.B. Joubert de la Ferté was posted away from the squadron to the command of No.14 Squadron in Egypt on the 2nd June and the squadron was then temporarily taken over by Captain J.A. Cunningham who had joined as a Flight Commander on the 31st May. Captain Cunningham was succeeded by Captain W.C.K. Birch who was posted to the squadron as Acting Squadron Commander on the 13th June.

By the 7th July the squadron had received the two

Bristol Scouts which had been allotted to it. The squadron then had on strength:-

Beverley	1 B.E. 12.
	2 B.E. 2. c's (one experimental)
	2 Bristol Scouts
Bramham Moor	3 B.E. 2. c's
Coal Aston	2 B.E. 2. c's
	1 B.E. 12.

There was also a B.E.12 (experimental) which was being overhauled at the Royal Aircraft Factory.

The armament of the Bristol Scouts, which were for day use only, consisted of a Lewis gun and at least seven drums of ammunition. For the B.E.12 which was for both day and night work the following scale of armament and equipment was laid down:-

BY DAY

1 Lewis gun firing upwards, and from three to five drums of ammunition.

1 Ranken Dart Box.

BY NIGHT

1 Lewis gun firing upwards, and from three to five drums of ammunition.

1 Ranken Dart Box.

10 French Rockets.

Navigation Lights.

Wing Flares.

1 R.L. Tube.

1 Accumulator.

Instrument Lights.

Instruments, Radium painted.

Although the position with regard to aeroplanes had by this time improved, there was not a corresponding increase in personnel, which on the 18th July comprised the following officers:-

Capt W.C.K. Birch	Squadron Commander
Capt M.F.G. Richardson	Acting Flight Cdr
Lt E.N. Clifton	Acting Flight Cdr
2nd Lt R.C.L.Holme	Acting Flight Cdr
Lt A. Somervail	Acting Adjutant
2nd Lt J.W. Lockhart	Flying Officer
Captain W. Wade	Assistant Equipment Officer

The next occasion on which the squadron were called upon to take an active part during an air raid was on the night of 28th/29th July 1916.

At about 11.20 pm information was received by the squadron from the Humber Garrison Commander that a hostile airship had been sighted some forty miles east of the mouth of the Humber proceeding due west. At this time however a thick fog in the vicinity of the aerodrome precluded any attempt being made to despatch aeroplanes. At two a.m. a further report was received of a Zeppelin proceeding from Driffield towards Hull. The weather being slightly clearer Lieutenant R.C.L. Holme ascended from Bramham Moor, but at 3, 500 feet above his aerodrome could barely see the landing flares and as the fog was becoming thicker he was forced to descend.

Of ten German naval airships which had set out on this raid, six only reached England, two of which the L.17 and L.24 had slightly penetrated the mouth of the Humber, dropping bombs without effect in the neighbourhood of Killingholme and Immingham.

On the night of the 2nd/3rd August, six Zeppelins raided England. Although the raiders confined their activities to the eastern counties of Norfolk and Suffolk, No.33 Squadron sent out a protective patrol over Hull and the Humber. Captain Holme ascended at 2.25 a.m. and patrolled towards Driffield, then turning south he circled round Hull at 10,000 feet. Visibility was bad and he could see nothing on his own level, so descending to 8,000 feet he went out over Hedon to the coast and followed it north to Atwick, whence Captain Holme states, "I now saw the searchlight at Beverley giving me the prearranged signal that all was over, accordingly I throttled down to come down. My lights had gone out and wishing to keep my hand lamp until near the ground I came down without it to 4,000 feet. When trying my engine I got into a mild nose dive but came out of it alright and landed without damage at 3.55 a.m."

The next raid on Hull took place on the night of the 8th/9th August when the L.24, one of eight Zeppelins which came in between Berwick and the Humber, dropped forty four bombs on the town, killing ten people and injuring eleven others as well as destroying a number of houses and shops.

A thick ground mist which was general all over England prevented aeroplanes from ascending. The mist effectively blinded the Hull anti-aircraft gunners, who were able to get off eight rounds only.

On the afternoon of the 2nd September, sixteen hostile airships, twelve naval and four military, set out for a combined raid on London. One, the L.22, crossed the coast at Skegness, turned north and carried out a devious flight over Lincolnshire and Yorkshire without

any apparent objective, evidently having abandoned any intention of making for London. Captain R.C.L. Holme, in a B.E.2c, in attempting to rise from Beverley to intercept the raider, crashed on getting off. The Zeppelin, after dropping three H.E. bombs in open fields in the parish of Flinton, went out over the sea at Aldbrough.

It was during this raid that Lieutenant W. Leefe of No.39 Squadron brought down in flames the S.L. 11 at Cuffley. This was the first occasion on which a hostile airship had been brought down in England, and for this exploit he was awarded the Victoria Cross.

On the night of the 23rd September information was received that hostile aircraft were approaching Spurn Head. Captain G.F. Richardson, ascending from Beverley at 10.45 p.m., kept up a continuous patrol from Beverley to south of the Humber until midnight without sighting the enemy. He was then compelled to land on account of fog and clouds. The Zeppelin L.22 had crossed the Spurn Lighthouse at about 10.35 p.m., and crossing the estuary to the Lincolnshire coast she came in at Donna Nook at 10.40p.m., where he went out one hour later after dropping several incendiary bombs inland.

The Midland and Northern Counties were again visited by four Zeppelins on the night of the 25th/26th September, when bombs were dropped on Sheffield, York and Bolton. The L.14 which had made York her objective, in passing dropped 4 H.E. bombs on the squadrons' night landing ground at Dunkeswick, without, however, causing any material damage.

Fog again greatly hampered effective action being taken by the squadron. At Beverley it was impossible for aeroplanes to ascend. Captain Clifton rising from Coal Aston at 10.55 p.m. was compelled by fog to descend after a patrol of twenty minutes, without having sighted the enemy. Captain W.C.K. Birch ascended from Bramham Moor at 10.50 p.m. and patrolled from Copmanthorpe to Pontefract. At a quarter to twelve eight searchlights came into action near Goole, but clouds encountered at 8,000 feet obscured the pilot's vision and on coming out of the clouds the searchlights had closed down. Shortly after midnight the searchlight at Collingham opened out and A.A. Guns came into action but no Zeppelin was visible. Weather conditions becoming worse Captain Birch was forced to descend at a few minutes to one, after having been in the air for two hours and twenty minutes.

Following the successes of the Home Defence Wing against the raids on the Capital (*No.39 Sqn destroyed 3 airships and forced one down between 3 Sep-1 Oct 16. Ed.*) the raiders gave the city of London a wide berth and concentrated their efforts on the Northern, Midland and Eastern counties.

On the formation of the Home Defence Wing, the broader question of the tactical employment of the home defence air units and their location again came under consideration. A scheme involving an entire change of policy as regards the distribution of air defence units was approved on the 26th July 1916. This scheme proposed that the system of defence by aircraft should be changed from one of individual and immediate protection of defined vulnerable areas, to defence by a barrage through which hostile aircraft would have to penetrate in order to reach the vulnerable areas. Hitherto the stationing of flights in the immediate vicinity of the area to be defended formed no definite line and left gaps through which the enemy could pass.

It was suggested that flights in the neighbourhood of such places as Birmingham, Sheffield and Leeds, should be moved further east with the idea of ultimately establishing a barrage of aeroplanes with accompanying searchlights across the east of England. The barrage line was to be formed about 30 miles inside the 'outer observer cordon' so as to allow of reliable information reaching the flight stations and of aeroplanes being up at 5,000 feet over the barrage line in time to intercept the hostile aircraft. Squadrons were stationed about 20 miles apart.

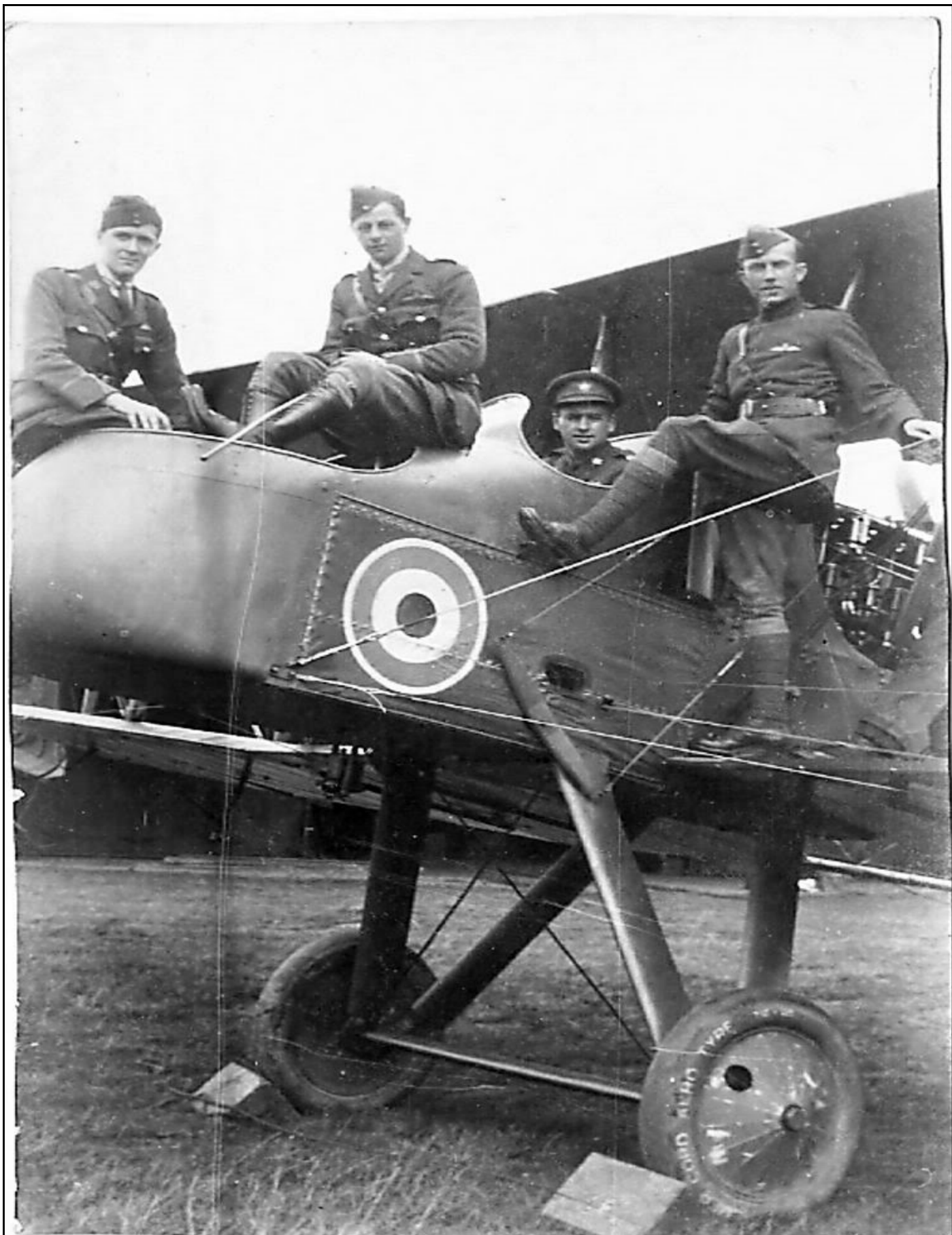
In accordance with this scheme the following redistribution of No.33 Squadron took place in October 1916. Squadron Headquarters moved from Tadcaster to Gainsborough, 'A' Flight from Coal Aston to Brattleby, (Scampton), 'B' Flight from Bramham Moor to Kirton-in-Lindsey and 'C' Flight from Beverley to Elsham. It was intended originally to station 'C' Flight at Hedon which was situated two miles east of Hull, but meteorological observations had revealed that on nearly every occasion on which Zeppelins had visited the district, all ground north and east, and all low-flying ground near the river was fog covered. Elsham which was seven miles south of the city, on high ground and fairly clear from fog was therefore decided upon.

Prior to these moves, No.33 Squadron, on the 1st October provided a nucleus for No.75 (H.D.) Squadron which then commenced to form at Goldington, Bedfordshire.

On the 5th October, Captain W.C.K. Birch handed over the command of the squadron to Major R.M. Vaughan, who at the beginning of November changed commands with Major A.A.B. Thomson of No.56 Squadron.

In November the squadron began to replace its B.E.2c's and B.E.12's with F.E.2b's and F.E.2d's with which type of aeroplane it continued to work until June 1918 when it commenced to receive Bristol Fighters.

The next raid occurred on the night of the 27th/28th



An F.E.2b plane with officers believed to be from 33 Squadron. Lt Harman was flying F.E.2b plane B416, a plane very similar to this, when he crashed. This plane is A5654 and was being flown by Lieutenant Thomas H. Coupe (from Blackburn) when it crashed at Scampton on 26th July 1917. He is one of six members of 33 Squadron killed in 1917 and 1918 who were not buried at Gainsborough, instead they were taken to their home towns in England and Scotland for burial. The officer in the pilot's seat looks remarkably like Lt. James Menzies (see following pages). (Photo courtesy of Mark Parker, Australia.)

November when seven naval airships crossed the coast. Five made their landfalls between Scarborough and the Humber at times varying between 9.10 p.m. and 10.50 p.m., and two in the vicinity of Hartlepool at about 11.30 p.m. Of the five, two were driven off by aeroplanes and gun fire. The remaining three confined their attacks to York, the Barnsley-Wakefield district and Hanley, doing little damage, however. One, the L.21 after dropping bombs in the vicinity of Hanley hovered over the eastern counties, emerging at Lowestoft at about 6.30 a.m. the following morning where she was brought down in flames by Flight Sub-Lieutenant E.L. Pulling of the Yarmouth Air Station.

On receipt of the warning that Zeppelins were approaching, Lieutenant J.B. Brophy of No.33 Squadron ascended from Kirton-Lindsey in a B.E.12 at 9.10 p.m. Patrolling north towards Winterton he saw bombs exploding near Beverley and two searchlights focussing on a Zeppelin ahead and about 3,000-4,000 feet above him. He climbed to 13,000 feet and gave chase which he continued for fifty minutes, driving into a headwind of considerable strength. By this time the Zeppelin had passed out to sea just north of Flamborough Head and Brophy finding he could not outdistance the airship abandoned the chase. On his return he saw bombs exploding in the vicinity of York and patrolled the district but could not sight the Zeppelin. He then continued his patrol between Winterton and Blyborough returning to his aerodrome at 12.30 a.m.

Lieutenant G.T. Willcox ascended from Elsham at 9.45 p.m. in a B.E.12 patrolled the Hull, Hedon and Spurn Head districts, returning to his aerodrome at 1.45 a.m. Captain G. Richardson also went up from Elsham in an B.E.2c at 10.10 p.m. and patrolled over Kirton-in-Lindsey, Elsham, Hedon and Grimsby. He sighted a Zeppelin held by searchlights over Hornsea at 12,000 to 13,000 feet and in his report states "I opened all out and headed for the coast just south of Hornsea, but when I got there the lights were out and the airship had proceeded seven to eight miles out to sea". On his return, he saw to the north what he thought to be a Zeppelin falling in flames. This proved to be the L.34 brought down by Lieutenant I.V. Pyott of No.36 Squadron at Hartlepool.

Three aeroplanes piloted by Captain C.H.R. Johnston and Lieutenants L.H. Jull and F. Egerton, which had endeavoured to ascend from Elsham, Kirton-in-Lindsey and Brattlebury, were wrecked in attempting to take off. The pilots, however, escaped without injury. The squadron sent up two further aeroplanes at 1.45 a.m. but by that time all the raiders had made off.

This was the last enemy raid on England during 1916 and the north of England was not again molested until the August of the following year.

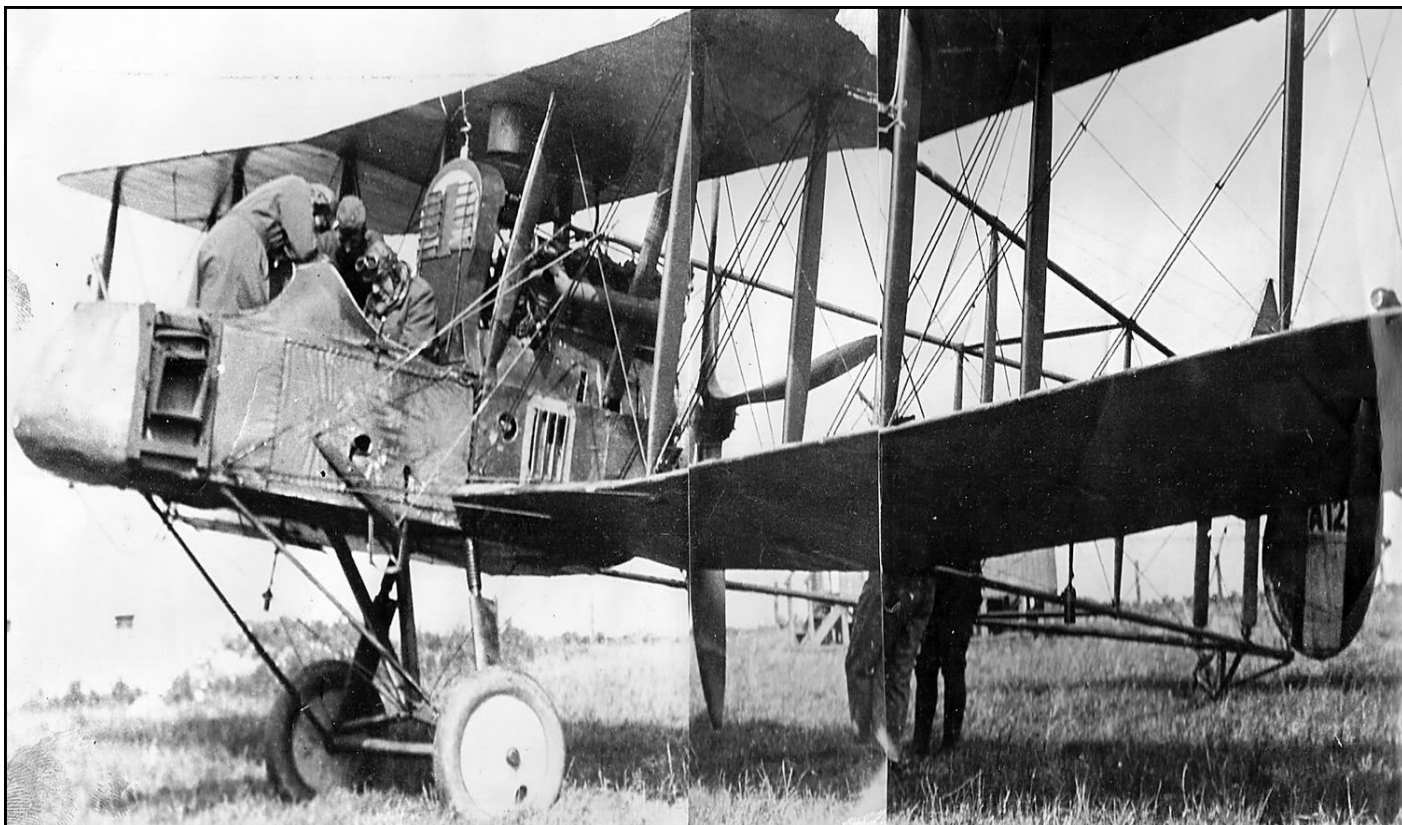
A conference on the question of aerial observation for Coastal Defence Batteries was held on the 8th November 1916 at which it was decided that the Home Defence Wing was to provide one aeroplane and one receiving station for each 9.2 inch Battery on the east coast and Portsmouth. In December, 'C' Flight at Elsham was detailed to co-operate with the Humber Garrison in addition to its home defence duties.

Records show that John Brophy was the first No.33 Squadron pilot to be killed in a flying accident following its formation in January 1916. He died on 24th December 1916 near Hibaldstow, Kirton-in-Lindsey, when his B.E. 12 failed to recover from a loop. He was 23. The Squadron's first fatality was Corporal Ernest Butcher RFC, who was killed in a motorcycle accident in Tadworth, Yorkshire on 13th May 1916. Corporal Butcher was 21 and came from Bishopsworth, Bristol and is buried in Fulford, Yorkshire.

By the beginning of 1917, the number of Home Defence Squadrons had grown to twelve and it was found that decentralization of control had become necessary. Accordingly in March 1917, these squadrons were divided into two wings, the Southern Home Defence Wing and the Northern Home Defence Wing. No.33 Squadron was allotted to the latter wing. Under this new organisation the Home Defence Wing became the Home Defence Group with headquarters in London. In August approval was given for the formation of an additional wing to be designated the Eastern Home Defence Wing. In September the Home Defence Group became the Home Defence Brigade.

A further reorganisation took place in October. In consequence of the large area covered by the Northern Home Defence Wing, various difficulties in administration became manifest, and approval was obtained in September for the creation of an additional wing known as the Midland Home Defence Wing. This wing was formed with headquarters at Stamford on 1st October 1917, by the transfer from the Northern Home Defence Wing of No.33 H.D. Squadron at Gainsborough, No.38 H.D. Squadron at Melton Mowbray, and No.51 H.D. Squadron at Marham. No. 192 Squadron in process of formation was also allotted to this wing. A fifth wing, the North Midland Home Defence Wing with Headquarters at Gainsborough was formed with effect from the 17th October, by the transfer of No.33 H.D. Squadron from the Midland Home Defence Wing and Nos. 199 and 200 Depot Squadrons from the Northern Home Defence Wing. These wings were then given numbers as follows:

Northern HD Wing	- No.46 (H.D.) Wing
Midland HD Wing	- No.47 (H.D.) Wing
North Midland HD Wing	- No.48 (H.D.) Wing
Eastern HD Wing	- No.49 (H.D.) Wing



F.E.2d A12 This plane was being flown on 24 September 1917 by 2nd Lt. Carey Pinnock when it crashed into trees in a wood near Elsham at 3.30 am. It was being flown on Zeppelin patrol "during air raid action." Lt. Pinnock survived the crash but his observer, Lt. James Arthur Menzies, was killed. Lt. Pinnock was killed in another F.E.2d crash at Elsham two months later, on 30 November 1917. Both are buried in Gainsborough Cemetery. (Photo courtesy of Mark Parker, Australia.)



Southern HD Wing

- No.50 (H.D.) Wing

Towards the end of October the Home Defence Brigade was redesignated VI Brigade and the qualification 'Home Defence' was dropped from the titles of Wings and squadrons.

To return to the activities of the squadron. On the afternoon of 21st August 1917 eight naval airships left the North German Sheds and made for the Yorkshire coast, apparently bound for a raid on Hull. Arriving about fifty or sixty miles from the mouth of the Humber they remained out at sea until midnight when one essayed an attack on Hull. The airship came in at Tunstall but failed to penetrate further inland than Hedon on which she dropped five H.E. bombs, injuring one man. A Primitive Methodist Chapel was destroyed and eleven cottages damaged. She was eventually driven off by A.A. fire and aeroplanes went out north of Withernsea at 1.40 a.m.

'A' Flight despatched three aeroplanes from Scampton between 10.44 p.m. and 12.50 p.m., 'B' Flight three from Kirton-in-Lindsey between 10.20 p.m. and 12.55 p.m., and 'C' Flight three from Elsham between 10.40 p.m. and 12.55 p.m., and three aeroplanes ascended from the landing ground at Gainsborough at about 1.30 p.m. Continuous patrols were maintained on the line Hedon - New Holland - Elsham - Kirton-in-Lindsey - Brattleby - Market Rasen - Stallingborough, the last machine descended at 5.15 a.m. Only two pilots, however, sighted the Zeppelin. This was no doubt due to the height at which she was flying, viz: 16,000 - 18,000 feet. Second Lieutenant H.P. Solomon flying a B.E.12 ascended from Kirton-in-Lindsey at 11.25 p.m. with orders to patrol from Scampton to Bellasize and Hull. At about 12.30 a.m. whilst patrolling at 15,000 feet in the vicinity of Beverley he sighted the airship north-east of Beverley steering east at what he estimated to be at 20,000 feet, and being heavily engaged by A.A. fire. He gave chase but could not climb and keep pace at the same time. He then fired three bursts at it from his Vickers' gun but was too far below to make effective shooting, he continued the pursuit twenty miles out to sea but could not catch up with the raider. He was then forced to abandon the chase owing to lack of petrol.

At about midnight on the 24th September ten hostile airships approached the coasts of Yorkshire and Lincolnshire, of these, six came inland, three of which (L.35, L.41, L.52) attacked the areas defended by No.33 Squadron.

The L.41 came in at Hornsea at 1.27 a.m. on the 25th, and made for Hull on which she dropped seven H.E. and nine Incendiary bombs which did surprisingly little damage and slightly injured three women. The airship then turned and went out to sea north of Tunstall at

2.50 a.m. The L.52 came in over the Lincolnshire coast at Theddlethorpe at 1.20 a.m. At 2.35 a.m. she dropped six H.E. and three incendiary bombs on Beelsby Top, followed at 2.40 a.m. by sixteen H.E. bombs east of the village of Cuxwold. These were intended for the R.F.C. landing ground which was lit up, but they fell well to the south of the lights and did no damage. She went out to sea near Tetney at about 3 a.m. The L.35 crossed the Lincolnshire coast at Anderby at 12.50 a.m. After a devious flight north to Winterton, she turned west and at 2.30 a.m. was heard midway between Barnsley and Doncaster. She then made straight for the brilliant lights of the Parkgate Iron and Steel Works and the Silverwood Colliery, north of Rotherham, but the lights were promptly extinguished and the bombs dropped missed their mark, and the only damage effected was the breakage of a few windows. The airship was eventually driven off by A.A. fire, searchlights and the presence of aeroplanes and went out to sea near Aldbrough at 4.50 a.m.

'A' Flight sent up three aeroplanes from Scampton between 11.20 p.m. and 3.35 a.m., 'C' Flight five from Elsham between 11.40 p.m. and 3.30 a.m. Continuous patrols were maintained between Elsham and Hedon and from Scampton to Blyborough. The Squadron Commander Major A.A.B. Thompson ascended from Gainsborough at 3.15 a.m. and patrolled on the line Gainsborough - Elsham - Hedon - Grimsby until 5.30 a.m. The sky was exceedingly cloudy during the raid and although it hampered the activities of the airships it afforded them protection against the aeroplanes, the pilots of which were unable to locate the raiders.

It was during this raid that the squadron suffered its first casualty. Second Lieutenant C. Pinnock who ascended in a F.E.2.d., struck a tree on landing and his observer Lieutenant J.A. Menzies was killed.

Although aeroplanes could not always locate and engage the raiders, their appearance exerted a major influence on the airship's commander who at times gave up all thought of continuing on a straight course and avoided dropping bombs in the hope of concealing his whereabouts. He was also compelled to operate at such heights as to preclude any certainty of aim when dropping bombs.

One of the most ambitious raids on the industrial towns of the Midlands and North Midlands was attempted on the 19th/20th October when eleven naval airships crossed the North Sea heading for a rendezvous to the east of Flamborough Head. The weather on this night is of great interest, as the peculiar meteorological conditions exercised a dominating influence on the raid and were the direct cause of the downfall of four of the enemy ships. While conditions on the land surface and at low altitudes

over England and the North Sea were quiet, with light north-westerly winds (15-20 MPH) up to 10,000 feet, above that height the wind suddenly increased to 35 - 40 m.p.h. and progressively increased at higher altitudes, till at 20,000 feet it was blowing a gale from north and north-west. The airships, after rising above 16,000 feet in order to avoid A.A. fire and aeroplane attack, were caught in this wind. In spite of their endeavours to work westward in order to attack the North Midlands, they were carried over the south-eastern counties and eventually over France, whence four of them were unable to regain their own territory. Two airships only were able to make their landfalls in the vicinity of Hull. The L.41 came inland at Cleethorpes at 7.15 a.m., steering south and at 7.40 dropped two H.E. bombs at North Carlton, north of Lincoln, killing two sheep. She then continued her journey south. The L.45 made her landfall over the Yorkshire coast near Withernsea at 8.20 p.m. Her course seems to have been considerably interfered with by the presence of aeroplanes which had gone up in pursuit of the L.41 an hour previously. She was able to avoid them by rising to a height of approximately 19,000 feet, at which height she navigated most of the time she was over England. After hovering in the vicinity of the mouth of the Humber until 9.10 p.m. she also turned south, dropping no bombs until she arrived over Northampton at 10.50 p.m.

A' Flight despatched five aeroplanes from Scampton between 7.55 p.m. and 1 a.m., 'B' Flight, six from Kirton-in-Lindsey between 7.10 p.m. and 1 a.m., 'C' Flight five from Elsham between 7.10 p.m. and 10.30 p.m. Two aeroplanes ascended from Squadron Headquarters at Gainsborough, one of which, piloted by Second Lieutenant H.P. Solomon, who distinguished himself in pursuit of L.42 on August 22nd/23rd, caught fire just after taking off and crashed, the pilot being killed.

Patrols were kept up between Scampton and Hedon until 1.45 a.m. on the 20th, but pilots had nothing to report. They were again frustrated by the great altitudes to which the airships ascended. The greatest height reached by any of the aeroplanes was 13,000 feet, which was some five or six thousand feet below that at which the airships were operating. This raid proved to be the last airship raid on England during 1917.

On the 21st November 1917 Major A.A.B. Thompson handed over the command of the squadron to Major C.G. Burge.

The next raid on the Hull district occurred on the night of the 12th March 1918, when three airships crossed the coast between Flamborough Head and just south of Hornsea between 9.25 p.m. and 10.05 p.m. Although bombs dropped on Hull and villages of Sutton, Swine, Seaton Ross and Melbourne, they mostly fell in open spaces and the only casualty was one woman who died from shock in Hull.

Attempts were made to despatch aeroplanes from Kirton-in-Lindsey and Scampton, but in each case the pilot was forced to descend after few minutes' flight on account of thick mist and drizzle.

On the 12th April, five airships crossed the coast between Withernsea and Cromer at varying times from 9.30 p.m. to 10 p.m. One which entered at the Spurn reached Wigan, and another which came in at Cromer found Birmingham. Each dropped about two and a half tons of bombs. Of the other three, one flew about the Humber and dropped her bombs harmlessly on the south side of the river. Another raided Lincoln with little result; while the fifth flew about the Wash and dropped bombs which fell for the most part where they could do no harm.

Aeroplanes were unable to ascend from Kirton-in-Lindsey on account of thick fog; one which rose from Elsham at 9.10 p.m. was forced down by thick mist and low clouds twenty minutes later. Scampton was able to despatch two; one, piloted by Lieutenant J. Heyes, observer Second Lieutenant E.H. Canning left the ground at 9.10 p.m. at 1,000 feet the pilot was unable to see the landing flares. He climbed to 5,000 feet but could go no higher as the weather was becoming worse. After patrolling from Scampton to Kirton-in-Lindsey approximately, until 11.16 p.m. without sighting the enemy, the pilot was compelled to descend through engine trouble. On coming down he could not locate any landing flares and decided to undertake a forced landing which he carried out successfully. The second aeroplane, piloted by Lieutenant L. Murphy, observer No.87832 AM W. Taylor, left Scampton at 10 p.m. and climbed over the aerodrome through mist and clouds to 4,000 feet and then heading towards Hedon climbed to 8,000 feet when, the pilot states "I saw an object in a break in the clouds against the stars which I took to be a Zeppelin. I judged it to be about 12,000 feet or 15,000 feet from the ground, and about 2½ to 3 miles east of my position. I turned towards it and climbed hard but could only reach 9,200 feet, owing to getting into thick clouds. At this height I was constantly running into banks of cloud or mist. I lost my object for about 4 minutes but picked it up again and found that it had gained distance from me. I held him in sight for about two minutes, during which time I was steering S.W. I did not open fire owing to long distance, hoping to get a more favourable opportunity, but suddenly my

object disappeared and I was unable to pick it up again". Lieutenant Murphy descended at Scampton at 12.25 after spending nearly two hours and a half in the air.

The General Officer Commanding the VI Brigade in his report on this raid stated that in his view of the weather he considered the performance of these two pilots to be exceptionally good.

The Northern Defence Area* was formed on the 21st May 1918 and comprised the four squadrons north of the Wash i.e. No.33 Squadron, Gainsborough, No.36 Squadron, Newcastle-on-Tyne, No.77 Squadron, Turnhouse, and No. 76 Squadron, Ripon. The authority for the issue of operation orders was now vested in the G.O.C. of this area in place of the Garrison Commanders. This Defence Area also took in No.38 Squadron. Melton Mowbray which had previously been directly under the orders of the VI Brigade.

With effect from the 1st June the VI Brigade was re-organised into two groups, Northern and Southern. The Northern Group, which on the 22nd June became No. 24 Group comprised the 46th and 48th Wings. For the purpose of operations this group came under the G.O.C. Northern Aircraft Defence Area. At this time No.33 Squadron was still in the 48th Wing.

On the 5th June 1918 Captain G.M. Turnbull assumed command of the squadron vice Major C.G. Burge. During the month Squadron Headquarters moved from Gainsborough and joined 'B' Flight at Kirton-in-Lindsey, and the squadron commenced to re-equip with Bristol Fighters.

The last German airship raid on Great Britain occurred on the 5th August 1918. Five airships arrived off the Norfolk coast between 8.30 and 9.30 in the evening, four of which dropped bombs harmlessly into the sea. These bombs were heard at Bedford (ninety-five miles away), and Weedon (115 miles). Weedon reported these bombs as sixteen miles away, which caused the alarm to be given to central England. The same bombs would appear to have been heard at Langwith near Sheffield (about 120 miles), but were reported as north-east of the post, either owing to some acoustic trick of the atmosphere, or owing to a mistake for south east in transmission.

The Officer Commanding No.33 Squadron received the warning just after half-past nine, but owing to adverse weather conditions, (a pilot who tested the conditions in the air at Kirton-in-Lindsey reported clouds at 600 feet, and although he climbed to 3,000 feet failed to get through), and the absence of reliable information, he decided to wait until the weather was clearer before taking action.

The first aeroplane was despatched from Elsham at

10.30 p.m. and patrolled over Hull and Hedon until 12.30 a.m. Lieutenant F.A. Benitz, observer Second Lieutenant H.L. Williams, took off from Scampton in a Bristol Fighter at about the same time but descended at Atwick twenty minutes later with engine trouble. This was rectified and a second ascent was made at ten minutes past eleven and a patrol lasting one hour and three-quarters was carried out between Scampton and Waddington. On landing at Atwick the aeroplane crashed and Lieutenant Benitz was killed and his observer seriously injured.

In all two machines ascended from Elsham, one from Scampton and three from Kirton-in-Lindsey. On this occasion the raiding airships did not reach the line of the Squadron's patrol. It was during this raid that L.70 was brought down in flames, in the sea, about eight miles north of Wells-next-the-sea at 10.15 p.m. by Major E. Cadbury D.S.O., observer Captain R. Leckie D.S.O. from the Yarmouth Air Station.

The duties of the squadron from now onwards consisted for the most part in the training of night-flying pilots and observers. It will be remembered that the system of combining training with Home Defence duties had been found unsatisfactory in 1916 and had resulted in the formation of the Home Defence Wing. In the spring of 1917, however, owing to the fact that there was only one 'Depot' Squadron i.e. No.98, to supply the needs of the whole of the Home Defence Group, it became necessary for Home Defence Squadrons to take in pupils in order to cope with the increasing demands for pilots created by the rapid expansion of the Home Defence Group.

At the beginning of 1918 the position in the North was that squadrons equipped with F.E. aeroplanes, of which No. 33 Squadron was one, received partly trained pilots from Night Training Squadrons, for passing out in their advanced tests, which consisted of: 100 miles night reconnaissance, a written examination on night flying armament and equipment, and work required of night flying pilots overseas, all aerial navigation tests, and ten hours night flying. On completion of these tests pilots were considered qualified night pilots and were posted to light night bombing squadrons overseas or were retained as operation pilots on F.E.s in the Service Squadrons. Night-flying observers were also under training in these squadrons and similar tests were laid down for these observers to pass before qualifying.

In June 1918 the first night fighting squadron was formed in the VI brigade and sent overseas. After this the Southern Service Squadrons fell a good deal below strength in Pilots, and it became evident that in order to maintain the supply of Pilots for these Squadrons, and the additional Night Fighting Squadrons contemplated for overseas it would be necessary to

find a fresh source for Scout Pilots.

It had been obvious for some time that F.E.s in the North were useless for operational purposes owing to their low ceiling. It was therefore decided to re-equip the Northern Service Squadrons with 110 H.P. Le Rhone Avros. When fitted with a Lewis gun and used as a single-seater these aeroplanes were found to possess a ceiling of approximately 18,000 feet. It was hoped that Pilots for the Southern Service Squadrons and for the Night Flying Squadrons could then be obtained by withdrawing from the Northern Service Squadron Pilots who had been flying these aircraft for some time and who could easily proceed to 'Camels' after a short course.

The pilots in the VI Brigade had now automatically fallen into three principal classes:-

Day and Night Fighting Pilots i.e. Pilots available for defence purposes in the three Southern Wings, or for posting to Night Fighting Squadrons overseas.

Northern Defence Pilots for defence purposes in the North, and ultimate conversion to Day and Night Pilots.

Light Night Bombing Pilots for training in the F.E. Night Training Squadrons, and despatch to the Light Night Bombing Squadrons overseas.

In August 1918 it was decided to divide the training of these pilots into three stages, called tests for Categories 'A', 'B' and 'C'. No.33 Squadron which was being re-equipped with 110 H.P. le Rhone Avros, received pupils from an Elementary Night Training Squadron where they had passed the tests for graduation to Category 'A' which comprised:- day and night ground gunnery, elementary aerial navigation and fifteen hours solo flying. No.33 Squadron then passed them out in the test for graduation to Categories 'B' and 'C', which included advanced gunnery, advanced aerial navigation, day aerial fighting, day cross country flying, sixty and 100 miles night reconnaissances, bomb dropping by day and by night, wireless tests and ceiling tests (17, 000 feet) repeated monthly.

On passing these tests the Pilot became a Northern Defence Operation Pilot and after three months service in a Northern Defence Squadron was posted to an F.E. Training Squadron for a short course on F.E.s prior to proceeding overseas as a Light Night Bombing Pilot or to a 'Camel' Training Squadron for conversion into a Day or Night Fighting Pilot on 'Camels'.

The squadron took over a further duty in August when arrangements were made with the Anti-Aircraft Defence Commander Leeds for aeroplanes to fly over the Sheffield A.A. Defences on occasions when the weather was suitable, to afford practice to the A.A. Gunners and searchlights.

One more duty which the squadron might have been called upon to perform was in the event of an attempted Enemy Invasion, in which case No.33 Squadron together with No.75 Squadron was to be allotted to the G.H.Q. Home Forces as a Reserve Squadron.

Little remains to be said. Squadron Headquarters and the Flights remained at their respective stations until 13th June 1919 on which date the Squadron was disbanded. The Squadron would reform at Netheravon on the 1st March 1929 as No.33 (Bomber) Squadron and was equipped with Hawker Horsley Bombers. Its first Commanding Officer, Squadron Commander F. P. Don was posted to the squadron on 10th April 1929.

*The London Air Defence Area, comprising all H.D. squadrons south of the Wash with the exception of No.38 Squadron, had been organised in August 1917.



2nd Lieutenant Francis Percival Don (above) joined the Scottish Horse Yeomanry in 1911 and transferred as a Captain to the RFC in 1916, initially as an Observer before gaining his flying certificate on 5 October 1916. He joined No.22 Squadron, flying F.E.2b's in November 1916 and by 1 January 1917 he was a flight commander. He was shot down on 5 June 1917 by Leutnant Werner Voss and became the 33rd of Voss' 44 victories. Don was wounded, lost his arm, and spent the remainder of the war as a POW. He remained in the RAF after the war and after reforming No. 33 Squadron he moved to command No. 502 Squadron at Aldergrove, flying Vickers Vimy and Handley Page Hyderabad in the heavy night bomber role. Following a tour as the Air Attaché in Berlin from October 1934 to November 1937 Group Captain Don returned to the Air Staff at HQ Bomber Command and, after promotion to Air Commodore on 1 July 1938, he became SASO, HQ No. 2 (Bomber) Group.

SUMMARY

No.33 (Home Defence) Squadron RFC (12 Jan 1916-31 Mar 1918)

No.33 Squadron RAF (1 Apr 1918—2 Jun 1919)

Formed: 12 Jan 1916, Bristol Filton Aerodrome, nucleus from No.20 Squadron*

Jan 1916 B.E. 2.c (until Jun 1917)

29 Mar 1916 to Tadcaster, dets York (The Knavesmire - A Flt), Headley Bar, Tadcaster (HQ Apr –Oct 1916), Coal Aston (A Flt) Bramham Moor (B Flt) Beverley (C Flt)

Jun 1916 BE12 (until Jun 1917)

Jul 1916 Bristol Scout (until Nov 1916)

1st Oct 1916 Prior to the move to Gainsborough, No.33 Squadron provided a nucleus for No.75 (H.D.) Squadron** which formed at Goldington, Bedfordshire 3 Oct 1916 to Gainsborough (HQ) dets Scampton (A Flt), Kirton Lindsey (B Flt) , Elsham (C Flt)

Jan 1917 BE2e (until Sep 1917)

Jun 1917 BE12a (until Sep 1917)

Jun 1917 FE2b (until Aug 1918)

Jun 17 FE2d (until Aug 1918)

12 Jun 1918 HQ co-located at Kirton Lindsey (B Flt), dets Scampton (A Flt), Elsham (C Flt)

Jun 1918 Bristol F2b Fighter (until Aug 1918)

Aug 1918 Avro 504K (NF) until Jun 1919

2 Jun 1919 to Harpswell

13 Jun 1919 disbanded

* No.20 Squadron was formed on 1 September 1915, as an RFC fighter-reconnaissance unit, and became arguably the highest scoring and possibly most decorated British squadron on the Western Front with 613 combat victories, a posthumous Victoria Cross won by Thomas Mottershead, four Distinguished Conduct Medals, and over sixty Military Crosses and Military Medals awarded to its members. Its ranks included over forty flying aces. The squadron transferred from the RFC to the newly formed RAF in April 1918. Post World War I, unlike most of its contemporaries, the squadron was not disbanded and was transferred in Jun 1919 to the North-West Frontier Province, India for policing duties, in the Army Co-operation role, equipped with Bristol Fighters, then Wapitis and Audaxes for the whole of the inter-war period. At the outbreak of WW2, the squadron was still equipped with Audaxes, which were replaced with Lysanders in December 1941, re-equipping with Hurricanes in March 1943. During the Second World War the squadron's Hawker Hurricane IIDs and IVs saw action against the Japanese. After the war, the squadron re-equipped with Spitfires in September 1945, and Tempest FBIs in May 1946, retaining these until it disbanded on 1 August 1947, whilst based in India.

** No. 75 Squadron disbanded North Weald 13 Jun 1919, reformed as No.75 (Bomber) Squadron 15 Mar 1937 at Driffield Yorkshire, with four Vickers Virginias and two Avro Ansons. Handley Page Harrows replaced the Virginias, and in 1939 the Squadron re-equipped with Vickers Wellingtons. It became No. 75 (NZ) Squadron 4 Apr 1940, the first Commonwealth squadron created in World War Two. No. 75 (NZ) Squadron was engaged constantly against Germany from 1940 to VE day. Operating Wellingtons, Stirlings, Lancasters and Lincolns, the squadron flew more sorties than any other Allied heavy bomber squadron, suffered the second most casualties of all Allied squadrons, and dropped the second largest weight of bombs of any Allied squadron. The highest Commonwealth award for valour - the Victoria Cross - was awarded to Sgt J A Ward for climbing out onto the wing of a Wellington he was second pilot of, when on an operation over Europe, in an attempt to put out an engine fire. Although badly damaged by enemy fighters' canon shells, the aircraft managed to return to its base.

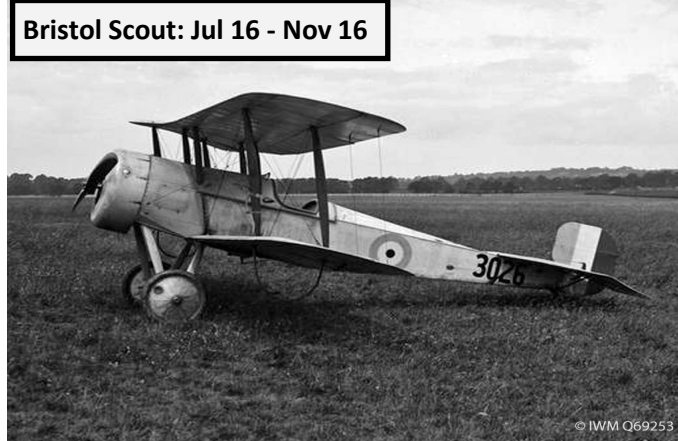
B.E. 2c : Jan 16-Jun 17



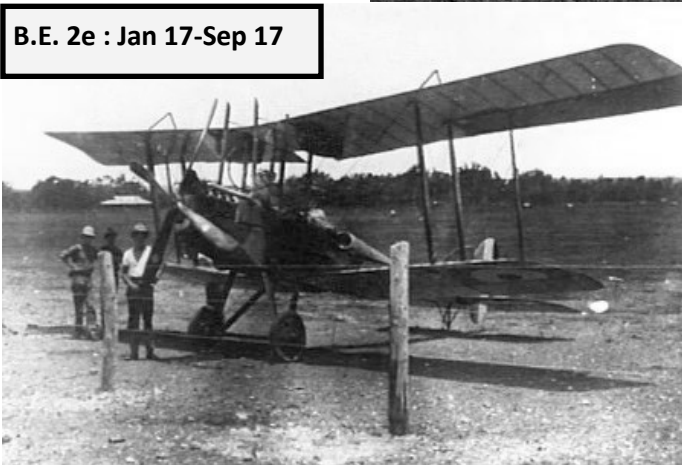
B.E. 12: Jun 16-Jun 17



Bristol Scout: Jul 16 - Nov 16



B.E. 2e : Jan 17-Sep 17

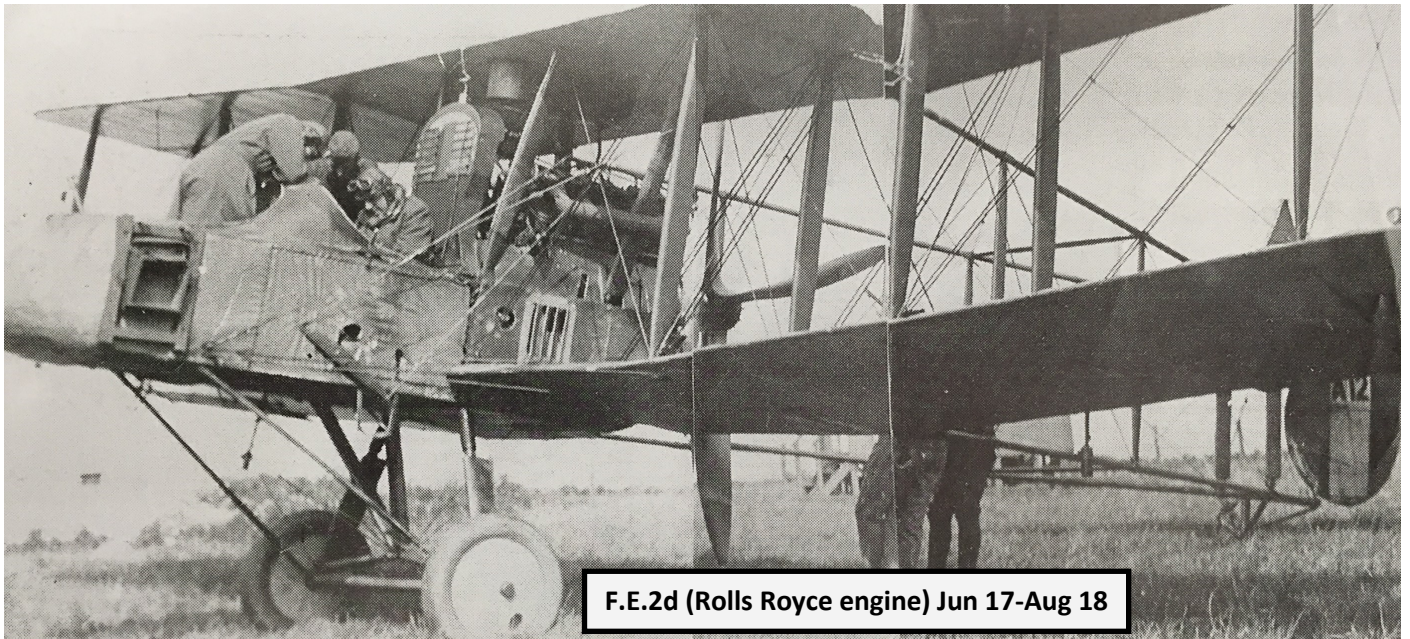


B.E. 12a: Jun 17-Sep 17



F.E.2b (Beardmore engine) Jun 17-Aug 18





F.E.2d (Rolls Royce engine) Jun 17-Aug 18



Bristol Fighter F.2b Jun 18-Aug 18.

Lt Benitz's Bristol F.2.b crash, Atwick , 5 August 1918



**The AVRO 504K of the Shuttleworth Collection.
Photo by Andy Fogg.**

Appendix 2: Major Cyril Gordon Burge

CO 33 Squadron 21 Jun 1917 - 5 June 1918



Cyril Gordon Burge originally was commissioned into the York & Lancaster Regiment, seeing service in India during 1913. He transferred to the Royal Flying Corps in 1915. Qualifying as an Observer he returned to France to join No. 12 Squadron, which had formed in February 1915 from a flight of No. 1 Squadron RFC based at Netheravon. The squadron moved to France in September 1915 and operated a variety of aircraft on operations over the Western Front. At the time that Burge joined they were operating B.E. .2b, B.E. 2c, R.E. 5, R.E. 7 and Bristol Scout aircraft.

A hairy moment for Burge occurred when, on the 5th December 1915 with his pilot Captain Lawrence, they were attacked by two Albatross German aircraft, whilst making for friendly lines. The enemy aircraft continued the attack, were joined by two further aircraft and later by a fifth enemy aircraft. Lawrence and Burge managed to crash behind friendly lines after being hit 30 or more times. Burge was sent back to the UK for pilot training and was awarded his Aviator's Certificate, No.2652, on 1 April 1916.

Cyril Burge was interviewed by the Imperial War Museum in 1972 (IWM 17) and recounted his time as a pilot with No. 36 Squadron, stationed at Ashington in 1916-17. No 36 Squadron was formed on 18 March 1916 at Cramlington, Northumberland as a Home Defence squadron, defending the coastline between Newcastle upon Tyne and Whitby against German Zeppelin attacks. On 27 November 1916, 2nd Lieutenant Ian Vernon Pyott, flying a Royal Aircraft Factory B.E.2c destroyed Zeppelin L.34 over Hartlepool, for which he was awarded the Distinguished Service Order (DSO). Burge recounted the instructions given to the pilots when sent up on patrol:

"If we were told to get one aeroplane up to patrol a definite area...he would go up and he'd usually climb as high as he possibly could and just look around and hope

that he might come into contact with a Zeppelin. He always used to know where the Zeppelin was because of (the) searchlights. Searchlights used to guide him...and if you've got a searchlight and a Zeppelin in a searchlight then you were home and dry, you could fly to it straight away and see it.

Then the thing was to know how to attack it and that depended on what equipment you'(d) got. If you'(d) got a machine -gun you used to try and get under its tail. If you'(d) got a rocket then you'(d) try to get above it so that the rocket used to fall down on top of it. If you'(d) got a bomb, similarly you get above it.

It wasn't until we got the machine gun and the explosive bullets and the bullets which not only exploded but fire bullets as well, that you could set a Zeppelin alight."

Once Zeppelin attacks on the North of England stopped, No.36 Squadron, like No. 33 Squadron, switched to training duties, becoming part of the Royal Air Force on 1 April 1918 before disbanding in June 1919.

Cyril Burge moved from No.33 Squadron to France in June 1918, and took over command of No. 100 Squadron from Major W J Tempest DSO MC on 13 June 1918, the man who had shot down Zeppelin L.31 in a B.E.2c over Potters Bar on 1 Oct 1916. No. 100 was established on 23 February 1917 at Hingham in Norfolk as the Royal Flying Corps' first squadron formed specifically as a night bombing unit and comprised elements of the Home Defence Wing. The unit was mobilised and crossed from Portsmouth on 21 March 1917 to France and was first based at St Andre-aux-Bois, where it received twelve Royal Aircraft Factory F.E.2b aircraft on complement. These aircraft had been withdrawn from other units where they had operated in daylight, so modifications were required to adapt them for 100 Squadron's operational role.

On 1 April 1917, the unit moved to Izel-le-Hameau and took a further four aircraft on complement, in the form of B.E.2es. The squadron began operations on the night of 5-6 April 1917, when eleven F.E.2b aircraft attacked Douai airfield, where Manfred von Richthofen's 'Flying Circus' was based; Richthofen referred to this raid in his book, *'Der Rote Kampfflieger'* (The Red Fighting Airman), describing the F.E.2Bs as "...old lattice tail.". One hundred and twenty-eight 20 lb (9 kg) and four 40 lb (18 kg) bombs were dropped; four aircraft hangars were reported as having been set on fire and one of the attacking aircraft was lost.

On 4 March 1918, the squadron was sent to Ochey, near Nancy, to form the nucleus of the Independent Air Force under Major General Hugh Trenchard. In August of that year, the unit converted to Handley Page O/400 heavy bombers and therefore longer range sorties over industrial sites in Germany became possible. The squadron conducted these raids throughout the rest of the war; an aircraft from the unit was the last in war-time to return to base (on the night before the Armistice) from a raid. Cyril Burge wrote a book in 1919 called 'The Annals of 100 Squadron', with a Foreword written by Air Marshal Sir Hugh Trenchard, in which he described the Squadron as 'the first complete night flying squadron that was sent to the Western Front' and 'one of the great squadrons of the war'.

In his book Burge described the F.E. 2b as follows:

"The Squadron was equipped with the F.E.2B machine on landing in France, and served with this type up to the end of August, 1918. It can truthfully be stated here that there was no machine that served its country so well as did this type. Perhaps this was due to the fine material which was always available to fly it, and that it was this factor which was largely responsible for the magnificent work it performed. Be all that as it may, it was undoubtedly a most excellent machine for night bombing, and the whole personnel of the squadron made the best of the machine and did it more than credit. The limit of its carrying capacity in bombs was a decided drawback to pilots and observers out for a really good strafe. Especially was this disappointing when over targets, and having just three 112lb. Bombs to drop, without the good fortune to obtain a bull's eye with just one. The machine was far too slow when amongst the enemy's A.A. guns and searchlights. This made it not a little disquieting to its occupants, who under such circumstances were wont to discharge their wrath upon the inventors, for being so inconsiderate and lacking in imagination. As a redeeming influence for overcoming this discomfort pilots were left to trust in the name of the girl they left behind them. To make it more clear, it would be as well to mention that the nose of each machine bore in block letters a girl's Christian name, and in some cases nicknames, which were obviously of importance to the pilot only. So much for

the machine."

In 1919 Burge was granted a permanent commission and was appointed the first Adjutant of the Royal Air Force College at Cranwell on the 5th February 1920, a post he held until 1922. It was here that he introduced his young nephew Douglas Bader to the wonders of flying in 1921, having married Hazel McKenzie, Douglas Bader's aunt on his mother's side. In August 1926 Burge was appointed personal assistant to Chief of the Air Staff, Marshal of the Royal Air Force Sir Hugh Trenchard. He held this position until his retirement on the 1st December 1928.

In 1926 Bader had decided that his future was with the RAF and he approached his uncle for advice and help. With Burge's help Bader was able to give all the right answers to the Commissioning Board. Now retired and living in Aldershot Burge received the tragic news on the 14th December 1931 about Bader's crash and that he was at the Royal Berkshire Hospital. He rushed to Bader's bed side to find that he had had one leg amputated and was in a critical state. Burge was given a camp bed and two occasions was summoned to the bed side. Bader rallied on each occasion and regained consciousness the following morning. On examination Bader's remaining leg showed signs of septicaemia. The surgeon, unable to speak to a distraught mother, turned to Burge and explained if the leg remained Bader would die, if the leg was removed Bader would probably die from operative shock, but it was his only chance. Burge instantly nodded his consent.

Cyril Burge was the editor of 'Air Annual of the British Empire' from 1929 - 1939 and was the founding editor in January 1930 of 'Royal Air force Quarterly'. Details of his WW2 career are sparse, but it would appear that this ex-33 Squadron CO played a part in the instigation of Operation Chastise. Under the 'Reason's heading of the Dambusters.org.uk website, one can read that:

'Squadron Leader C G Burge, representing the Air Targets Sub-Committee of Aerial Intelligence, reported that the amount of water consumed in the whole of Germany was only three times that of the Ruhr and that the bulk of it was obtained from one large reservoir contained by a single large dam known as the Möhne Dam. He added that there were also four or five other reservoirs in Germany which fed the inland waterways. The destruction of which was likely to leave the waterways high and dry which would severely effect the German transportation system. It also seemed reasonable to believe that the damage caused would be extremely difficult to put right.'

(<http://www.dambusters.org.uk/the-dam-raids/the-reasons/>)

Cyril Gordon Burge died in 1975.

Appendix 3: Captain Albert Baird Fanstone

Albert Baird Fanstone, A.F.C. was born in the Azores of British parents in March 1892. His parents were Christian Protestant Medical Missionaries who moved to, and worked extensively in, Brazil for many years.

He was granted Aero Certificate 3031 on 19 May 1916, and graduated from the Central Flying School at Upavon. One month later he was posted to No. 12 Squadron (BE2ds and BE2es), Avesnes-le-Comte in France from June to December 1916. The Be2 was an RFC workhorse and well past its prime. It was used mostly for artillery spotting and photo reconnaissance and these squadrons were kept very busy with this important work in spite of heavy losses as the war progressed. He was involved in a serious crash on the 6 December 1916 whilst flying a dual-control BE2d with Captain L.O. Crowther. Fanstone had hitched a lift to No. 8 Squadron who were stationed at the nearby airfield of La Bellevue to visit an old friend. When it was time to return home no lift was available so he rang his own Squadron to see if anyone was available to fly over and pick him up. His Flight Commander, Captain Crowther, obliged in a dual control machine which had recently been delivered to the Squadron. The dual controls were very primitive, consisting of a rudder bar and detachable joy stick which was clipped to the side of the cockpit when not in use. Crowther had not had the opportunity to try the dual controlled machine and, when Fanstone had taken off, Crowther signalled that he wished to take control from the front seat. Crowther flew the aircraft back to base and commenced a circuit of the airfield when the control column became detached and the aircraft plunged into the ground from 300 ft very close to the Officers' Mess.

Crowther was killed instantly and is buried at Avesnes-Le-Comte; Fanstone was only slightly injured (concussion, facial cuts and bruises and a sprained wrist), and returned to England for convalescence. The incident highlighted a serious defect in the dual control Be2s and, after an enquiry and the recommendations received, the control columns were immediately replaced by metal ones which could be firmly held in place by a locking pin.

Fanstone rejoined No. 12 Squadron, April-May 1917, was promoted to Captain and moved to No. 8 Squadron in France until October 1917. During his extensive service in France he was involved in a

considerable amount of war flying. During his time with No. 12 Squadron he completed 83 artillery cooperation and photographic tasks and also 25 bombing raids over the front line. With No. 8 Squadron he completed 164 artillery cooperation and photographic tasks and also 25 bombing raids over the front line. Fanstone always wanted to fly fighters on the Western Front but this was denied.

Later that year Fanstone was employed in the Air Defence of Great Britain as a night pilot flying BE 12s with No. 39 and No. 78 Squadron, based at Sutton's Farm, Hornchurch. On 1 December 1917 Captain Fanstone commanded 'D' Flight of No. 78 Squadron at Biggin Hill, the first Operational Unit to operate from what was to become one of the most famous R.A.F. airfields.

In early 1918 he transferred to No. 37 Squadron, Stow Maries, and commanded 'B' Flight from 21 January to 31 March, and later moved to No. 33 Squadron at Elsham Wolds where he commanded 'C' Flight from April 1918 to April 1919. Their purpose was to intercept German Gotha and Giant bomber aircraft as well as the infamous Zeppelin and Schutte-Lanz airships.

He was made captain R.A.F on 1 April 1918. At the close of the Great War Fanstone was flying Bristol Fighters with No. 33 Squadron from Elsham and, on the night of 5/6 August 1918, he took part in operations against the last Zeppelin raid of the war.

Captain Fanstone left the RAF in 1920 to take up a place at Cambridge University. He was then Grade III Education Officer at the School of Technical Training (Boys) Halton. He may have served abroad for a spell and Kalafrana at Malta has been mentioned.

On 18 October 1942 he was in the Administrative and Special Duties Branch and it is believed that he finished WW2 as a wing commander.

Albert Fanstone, who was a devout Christian and lifelong teetotaler, lived in Brighton for many years until he passed away in 1985.

Appendix 4: 'Night Raiders of the Air'

2nd Lieutenant A R B Kingsford

The story below is based on a talk by Margaret Kingsford about her father-in-law, Alfred Reginald Bellingham Kingsford, given to the Nelson Historical Society in 2012.

"To the people of Nelson in New Zealand, the name of Reg Kingsford is familiar as a Nelson photographer from Broma Studios. However, Alfred Reginald Bellingham Kingsford was also a World War I fighter pilot with 33 Sqn and 100 Sqn. As a young teenager, 'Reg' Kingsford had taken up a photography apprenticeship and migrated to Australia aged 19 to take up a photographic job in Sydney. A while later he moved to New Zealand to work in Nelson for the Tyree Studio. He was in Nelson when World War I broke out and he volunteered, enlisting in the Medical Corps in the 6th Reinforcements of the 2nd New Zealand Division, New Zealand Expeditionary Force.

Having reached Egypt, Reg was on board the ill-fated *Marquette* troopship when it was torpedoed en route to support the Gallipoli campaign. He encountered the German Zeppelin threat for the first time while in Salonika. German airship operations in the Balkans had started in the autumn of 1915, after an airship base was constructed at Szentandras in Romania. This base was used by LZ 85 to conduct two raids on Salonika in early 1916: a third raid on 4 May ended with it being brought down by anti-aircraft fire from the battleship, *Agamemnon*. The crew survived but were taken prisoner. It was while he was in Egypt that Reg decided that he wanted to fly, after seeing a Maurice Farman Shorthorn operating round Heliopolis. The *Marquette* was not to be Reg's last brush with death at sea; he was also on board a ship that was sunk between England and France with the loss of 189 lives. Reg survived and arrived in France just in time for Christmas 1916 and served on the Western Front.

Around this time the call went out for 200 New Zealand volunteers to join the Royal Flying Corps. Britain was trying to build up an air arm to match Germany's and Reg and a friend decided to give it a go. In May 1917 they transferred from the NZEF to the British Army and into the RFC.

Following flight training Reg's first operational posting was to No.33 (Home Defence) Squadron helping defend Britain against Zeppelin attacks. It was long, monotonous flying punctuated by nail biting moments as pilots negotiated pea soup fogs, avoided being shot down by enemy fire, and endeavoured to make it home without running out of fuel somewhere over the English Channel. Reg was lucky, his only emergency landing was

over land and aided by a farmer who had rigged up a lit landing strip for just such emergencies.

In January 1918, Reg was transferred to No. 100 Squadron, the senior and best operational bombing squadron on the Western Front. Here he dived with death regularly. On one occasion Reg's plane was disabled by gunfire and as he looked for a suitable place to land, his crew member Bourne let go the bombs and threw gear overboard to lessen the load. Still 18 miles on the "wrong side of the (enemy) lines" Reg was losing power and height and flying into a head wind. It became clear they weren't going to make it and as Reg headed towards a clear patch of ground, the wheels touched uneven ground and there was a splintering crash. The plane had hit trenches and although Bourne was thrown clear, Reg was tangled up in the plane wreckage.

Eventually struggling free, both men collapsed in the unoccupied trench, wondering which side of the line they were on - Allied or German? Feeling their way through the trench, "...we found ourselves face to face with the business end of the biggest revolver I have ever seen in my life...'Qui êtes vous? (Who are you?)' came the whispered question. I was never so glad to hear French spoken in my life and almost keeled over with relief."

During another raid one of the plane's bombs would not release. Reg did everything he could to dislodge the bomb just 20 miles from home but it stuck fast. Eventually Bourne took Reg's walking stick and prodded and poked the bomb and when this proved unsuccessful, he climbed out of his seat, swung over the side of the plane. Clinging on for dear life with one hand, he used the other to bat at the bomb. "I was convinced our luck had finally run out, when, all of a sudden, the offending bomb fell away," Reg recalled. "I had never seen anything like it 'til then and have never seen anything like it since." Bourne climbed back inside and they returned home safely though "we were both pretty well done in". Although Reg tried to get recognition for Bourne, his heroism was never formally recognised.

Reg's posting finished in August 1918 and his log book showed he dropped 151 bombs weighing a total of 3.8 tons, and spent 142.5 hours flying in France with No. 100 Squadron.

Upon his and his wife Charlotte's return to New Zealand in 1919, Reg purchased Broma Studios in Nelson and had a successful photographic career, until his



A.R. Kingsford in pilot's uniform.
Photo courtesy Margaret Kingsford



Reg and Charlotte Kingsford in uniform.
Photo courtesy Margaret Kingsford



Reg Kingsford in later life.
Photo courtesy Margaret Kingsford

retirement in 1966 at the age of 75. The studio's photographs can be viewed at the Nelson Provincial Museum. Although his son Peter worked in the studio with his father, he became a pilot in World War II and was killed during a raid on Tobruk. One of Reg's twin sons, Hugh, then joined his father at the studio and carried on the family business until his own retirement in 1983. Hugh's wife Margaret, also worked for the studio. Reg died in 1987.

Having read this report online I bought a copy of Reg Kingsford's book, which is a fascinating account of his short but very varied military career. To summarise his service until he joined 33 Squadron, Corporal Kingsford's application to transfer to the RFC was successful at the third attempt while he was in France. Following interviews with a Major Boyd, an RFC officer, and then at the RFC HQ at St. Pol near Abbeville he was told to report to Farnborough to commence pilot training. Arriving at Farnborough in the winter of 1916-17 he was immediately granted two week's leave. Returning to Farnborough his course was sent to the Flying School at Denham to become officers, under the strict tutelage of a Captain Robertson. After passing out from Denham the course moved to the Advanced School in Oxford, where he was billeted in Queen's College. There were lessons on engines, wireless, rigging, theory of flight, machine guns and many other subjects, involving many hours of study, precluding any opportunity for leave. Four hundred aspiring aircrew sat their final exam in Oxford Town Hall, and all bar one of Alfred's course passed out as 2nd Lieutenants. The day after graduation seven new officers turned up at the Orderly Room of No. 4 Reserve Squadron at Northolt Aerodrome and reported for flying. Alfred recalled that the first aircraft he flew in, taking off on a cold, misty morning at 0630, was a Maurice Farman Shorthorn, airframe 7066. For his first week he logged 1 hr 40 min dual. He went solo after 13 days.

The next phase of his training was with No. 19 Squadron at Hounslow, flying Airco DH.1s and F.E.2Bs and practising air photography and how to use machine guns and wireless. On one of his sorties to London Colney he was ordered to stay on the ground by the Squadron as there was a twenty two-strong Gotha raid in process over London. After ten hours solo on F.E.s the final hurdle was attempted - night flying and landings. Although none of the course were very keen, the incentive was to pass and be awarded pilots' wings, and they all pinned on their wings the following day.

From Hounslow the course moved to the Aerial Fighting and Gunnery School at Turnberry in Scotland and were billeted in the Great Western Hotel. Despite the views, the golf and the chambermaids they were made to work hard: "...parade at six-thirty and machine guns till dark." From Turnberry four of the course were sent to York,

being informed that they would be concentrating on night flying, which caused them great disappointment. After arriving at York, Alfred and his colleagues were sent over to 33 Squadron near Lincoln. Chapter V of his book, 'Night Raiders of the Air' is entitled Night Flying and covers his experience of life with 33 Squadron in Lincolnshire:

Night Flying

Our new aerodrome was a good one and a decided change after Hounslow. It was about three-quarters of a mile long, with good width. In addition to the Home defence Flight, there were two training squadrons flying Avros, B.E.'s and an odd Spad or two. There was plenty of activity.

Our machines were F.E.2Bs, equipped with one hundred and sixty Beardmore engine. A machine gun was fixed to the front seat, to be used by the observer. There were three machines, with the same number of pilots and observers for operation. Emergency landing flares, which could be ignited by pressing a button in the cockpit, were fixed under each of the lower planes. A parachute flare could also be dropped from the back seat. This would hang in the air and light up the ground for about three minutes. There were also three other machines, used for training purposes.

Ours was A Flight, while B and C were thirty miles north and west. Our patrol was north of the Humber and ten miles south of Lincoln. After a few flights, we realised that these buses were totally unfit for the job. They were not capable of climbing higher than about twelve thousand feet, while the Zepps seldom came over at less than eighteen to twenty thousand. We expressed our views and were granted permission to do anything with the machines to enable them to get higher. This caused tremendous competition between the three of us. Ceiling test were frequent, without producing anything startling until the engine was taken out of my bus and three hundreds Rolls Royce put in. With this extra power we expected something great but, even then, old 1884 would not go higher than sixteen thousand, and it took nearly an hour to get there. I did away with the observer, put the machine gun on to a mounting to enable the pilot to use it, placed a cowling over the front seat and streamlined it, and then de-rigged her. But I only got another hundred feet, so we took the cowling off again. It seemed pretty hopeless trying to get Zepps in these antiquated machines.

England's aerial defence at this time was pretty rotten, and the Hun could have done what he liked with us had he known. That's what makes me think that his secret service couldn't have been what it was cracked up to be, or he would have known just how weak our defence was. However, we did our best in the circum-

stances. I think Robinson, Brandon, Tempest and those chaps must have got their Zepps at lower altitudes, probably when they came down to do their bombing. They were in B.E.'s and perhaps got a bit more out of them than we did out of our old FEs.

The Huns' Zepp base was at Heligoland, due east of Spurn head. His course was due west until he struck Spurn head, where he would pick up the lights of Hull, invariably turning south and passing right over the aerodrome, then picking up Lincoln and apparently following the Northern Railway down to London. He always came in what we called the dark period, when there was no moon, and during the is time we were not allowed to leave the aerodrome after dark, operation pilots standing by the whole time, with machines ready and ears pricked up every time the telephone bell rang. We always hoped that it would be orders to take to the air, our first intimation usually being from the Navy. "Zepps sighted forty miles east Spurn Head, proceeding west," later, "Zepps still proceeding west, now twenty miles from coast." At this stage, the first operational pilot would be ordered up with certain instructions, the remaining two at ten minute intervals. Our patrol was for three hours, and we took our turn in being first.

Owing chiefly to the fog, England was not the best of countries for flying, particularly at night. The fog was our worst foe, and being near the coast, we had to be extra careful not to go wandering out over the sea, a matter very easily accomplished at night in a fog. Two or three of our chaps went west that way, and we never heard of them again. We could only conclude that the North Sea claimed them as victims.

On the twenty-first of August, 1917, I took to the air in quest of Zepps for the first time. We received our first news of them at ten-thirty p.m., and at eleven o'clock, Robiers and I taxied out, having been given a great send-off. All the pupils from the training squadrons used to turn out to see our show and would hang about all night for our return.

We circled the aerodrome for some time to gain height and then turned north, registering five thousand. The night was beautifully clear and starlit, but cold, and we tootled along past the blast furnaces at Scunthorpe, where the reflection could be seen for miles. No doubt the Hun knew the position of this furnace and it would help him to get his bearings. Why they didn't try to lessen the flare we could never understand, and it was some considerable time before they thought to do so.

By the time we reached the Humber, our height was ten thousand, and again we circled round and round to get higher, both piercing the darkness with bulging eyes in the endeavour to glimpse a target. Seeing a searchlight pop up over Hull, we set our nose in that direction, and soon there were about half a dozen, lighting up the sky.

This show promised well. We were now over the Humber, just about where the ZR2 broke her back some time later. We were hoping to break the back of a Zepp before long.

I don't know what Robie's eyes were like, but mine seemed to be nearly out of my head by this time. Shells were bursting all over the place, although there was no sign of the Zepp as far as I could see. Our altimeter showed twelve thousand. Gee! This old bus was slow but I had a feeling that our luck was going to be in. We were now off our patrol, but hwat did that matter so long as there was something doing. The gunfire stopped and the searchlights were scanning to and fro, an almost certain sign that they'd lost him. Our hopes went down correspondingly, as one by one the searchlights lowered, until all was darkness again, and the Zepp went gaily on her errand of destruction.

We groped around for another two hours, realising that we'd been pretty near, and still not wishing to give up all hope, saw the remaining hours out and then, benzine being low, were obliged to land. We longed for the next raid and began to feel that after all there was a certain amount of fun in Zepp hunting, never knowing when you might spot one, even if he was five thousand feet above you.

Brooky and Watson were both down when we arrived. Like us, they had seen the gunfire and sat with bulging eyes. No one got a Zepp that night.

The next dark period was a disappointing one; the Huns left us alone and we were peeved. All kinds of new gadgets had been invented and adorned the cockpits. Reid, my new observer, was itching to hunt the skies, and we did a good deal of night flying without incidents or crashes, save for one fatality, for which I was responsible.

We were carrying out forced landings one night and I pushed the parachute flare through the tube, but it failed to ignite. A few days later, a bill for twenty-five pounds was presented to me by a farmer, who called at the aerodrome with the complaint that the flare had hit his pet horse on the head. The following morning, Tony did not answer the roll call.

About this time, the Americans sent over two hundred of their picked men for the Flying Corps. The heads didn't know what to do with them, as the training squadrons were all going hard with our own pupils. Eventually they sent a few to each Home Defence Flight and in our spare time we were told we could teach them something.

Eight of them turned up at our Flight, good chaps too, and we enjoyed their company. Big Jeff was full of good humour, stood six feet odd and weighed about fifteen stone. I pictured him trying to get into the cock-

pit of a Spad or Sopwith Pup, but anyway, our Jeff turned out a good flyer and flew in the Dole Race.

Ned was a great boy too, full of Yankee stories, and he used to have competitions with Sid to see who could yarn the most. They introduced all sorts of new drinks into the mess, port flips, egg flips, all sorts of flips. One of their number would get up and act as shaker, mixing the concoction, then shaking at considerable length in a metal tumbler with a lid. After it was shaken into what appeared to all froth, he would triumphantly hand you the mixture, and if you blew the froth off, you blew the drink away. Nevertheless, the port flip was quite a decent thirst quencher.

These chaps were the keenest mob for flying I ever struck. They were willing to go up any time, in any weather, and with anyone, irrespective of their ability as a pilot. Jeff loved speed and I used to take him up in the F.E.2.D. which I used for operations. The machine did about ninety full out, which in those days wasn't bad. On one occasion we were up about five hundred feet, when he yelled over from the front seat:

"Won't she go any faster?"

"Yes," I called back, "you watch her." I accordingly stick her nose down, with the engine full on, and lowered to about fifty feet off the ground and one hundred and forty miles per hour, holding her there until I thought the wings might buckle, and watching Jeff all the time. He never grabbed hold of the sides until he thought I'd gone mad and was going to fly straight into the earth, then I pulled her up in a great zoom, finishing up in a climbing turn. He turned round as I flattened out again and at first his face was a blank, then it suddenly lit up and he yelled:

"Gee! Boy that was great." He'd had his first real thrill in the air, he said. The next time I took him up, we reached twelve thousand and his nose started to bleed all over the show. He was in some pickle by the time we got down and I told him it was due to too many port flips. Jeff was annoyed and asked me not to let any of the boys know. He was afraid it might be looked upon as a physical effect and be the result of his getting chucked out. I believe that would have sent him potty, he was so keen.

We did lots of bombing practice and machine gunning for these chaps, and now and then a little visiting to the other Flights. C Flight over at Kelstern was a favourite flip for Jeff and myself.

Our next Zepp raid did not take place until October eighteen. Something must have gone wrong that night. We had a warning and were up at the hangars, machine ready and flares alight, with the usual crowd to see the fun. We were standing by our machines and I was booked to take the air first, when, without any warning,

there was a terrific explosion on the far side of the landing ground, followed by another at not half a minute's interval.

Even then we did not realise what it was until Reid, my observer, who was standing by, grabbed my arm and said:

"Listen, can't you hear it?" There was no doubt about it now, a Zepp was right overhead and there we were, still on the ground, waiting for orders to go up. The Zepp had seen our landing lights. We waited no longer for orders to go up. Reid swung the prop, kicked the chocks away, hopped in and off we went, realising that it was a golden opportunity lost. A Zepp and right over our aerodrome; how on earth it had got so far without our receiving orders, puzzled us. Someone had been lax of course, and by the time we reached any height worth mentioning, the Zepp was probably fifty to a hundred miles away.

We patrolled to and from the Humber to south of Lincoln, and two hours passed. Having nothing to do, we were frozen, and I gazed overboard to see the landing lights of an aerodrome burning. We turned north again, noticing the beauty of the starlit night, although, as we neared the river once we more, things appeared rather hazy, and by the time we had reached our most northerly point and turned south, nothing could be seen at all. The familiar ground lights had disappeared and we seemed to have run into a cloud, so we continued south for a bit, thinking we were somewhere near our own aerodrome. We came lower to see what it was like – at fourteen thousand everything was thick fog everywhere. Pulling the throttle back, we dived down a couple of thousand feet, but it was still so thick that I couldn't see Reid's head in the front seat. I was obliged to fly the bubble to keep her on an even keel and came down to three thousand. Trying a few miles in every direction in hopes of finding a clear patch, proved without avail, dense fog enveloped everything. We couldn't even find our way down at a few hundred feet, our three hours was up and I knew that our benzene supply must be pretty low. Anyhow, we had to land somewhere, but where? We were in a rotten hole. Reid called over:

"What are you going to do?"

"Land as soon as I can see where to," I replied, then turned her north and decided to give it another ten minutes. My altitude was showing three hundred feet. Fortunately it was flat country and I knew we were pretty safe, my only fear being that we might be out to see, as the coast was only twenty miles from our aerodrome, and in such dense fog it was easily done.

After proceeding north for a short time, Reid yelled excitedly:

“Lights, slightly to the port side.”

We made for them right away, came down to one hundred feet and flew round a few times. “What do you make of them?” I yelled to Reid.

“Looks like an emergency landing,” he said.

It certainly did, too, for there was the long and short arm of the letter L dimly discernible through the fog. The parachute flare lit all right when I pushed it through, but it seemed to make matters worse and increase the haze near the ground. Waiting for it to burn out, I decided I’d have to land without lights. We couldn’t have been fifty feet up now and I turned into position, and throttling back in the fog, misjudged the distance. Before either of us knew anything, we had hit the ground. Reid was thrown clear, turning a complete somersault as he left the bus, while I managed to knock out some teeth on the dashboard. The machine presented a good picture, with crushed undercarriage and tail up in the air.

Two mechanics who were posted at these emergency stations came rushing out.

“All right, Sir?” one enquired.

“Yes, and damned glad to get down,” said Reid, “Give us a cigarette.”

“Gosh, you weren’t half lucky, Sir,” the mechanic said, “we heard you for some time up in that fog, wonder you didn’t knock the top off something flying around here.”

Next morning, we realised just how true his words were. We had landed at an emergency ground just south of the Humber, and our O.C. had rung up, hoping to get news of us. They had tried to recall us with rockets owing to the bad weather coming. With the aid of these rockets, Brooky and Watson got down all right and we wished we had done the same. Still, we were safe, although I felt annoyed that the old bus was damaged.

We arrived back at our aerodrome the following afternoon, and found them relieved beyond measure to know of our safety. One of C Flight’s had forced landed the same as ourselves, and one of B Flight’s had not been heard of. The worst was feared, and our suspicions were verified a few days later when some wreckage of a plane was found by a trawler in the North Sea. This Zepp strafing job wasn’t much good, so Brooky and I decided to put in a request to be transferred overseas.

That night, the Zepps had a bad spin too, five being brought down one way and another. One surprised a sector in the southern part of the line in France, by looming out of the fog just over their heads in the early hours of the morning, giving them good target practice.

A week after this incident, Brooky and I were sent down

to Lympe, near Folkestone, to ferry two new buses back to Scampton. We left Lympe about three o’clock in the afternoon of a winter’s day and reckoned on reaching Hounslow in order to spend the night there. On arriving at dusk, the OC seemed like a bear with a sore head, must have had a night out, we thought. At any rate, he told us we couldn’t stay there, his hangers were full up.

“And you can’t leave new machines out all night,” he said, “you’ll have to go to Hendon.”

There was a bit of mist about too, and we knew we had valuable planes with us. It had been impressed on us before leaving that we could not, on any account, take risks with them. We were keen to land the machines safely at Scampton, so there was nothing for it but to push on, more especially as the OC ordered us to leave. We arranged to keep together, both knowing the country pretty well, and providing we could pick up the Welsh Harp, we would be all right. It was quite near Hendon aerodrome, but the landing ground in those days was not good, just a three-cornered place, with the railway running along one side.

Immediately we got up, we lost sight of one another, and the increasing darkness gave us no time to look round. Luckier than Brooky, I eventually picked up the Welsh Harp, and was set. Landing in the dark, however, I very narrowly escaped disaster, for my wheels touched ground not two yards away from a large hole in the middle of the aerodrome, made by the Huns in their last raid. I could just see a flag sticking up as I passed over, and wondered why the dickens it hadn’t been filled in before. I went and had a look at it, and realised how near a smash I’d been.

Brooky and I had previously arranged, in the event of being parted, to meet at the Strand Palace, and I waited for him, but he failed to put in an appearance until just after nine o’clock. He had landed down at Northolt and was obliged to wait for a train to town.

The following three or four days proved impossible for flying, thick fog predominating everywhere. We went to our respective aerodromes each morning, hanging around all day for nearly a week, until one morning I rang our OC at Scampton, to learn that the weather was all right there and received orders to try and get through. By ringing aerodromes on the way north, we found that the fog was only in a fifteen mile radius, so I decided to give it a go and rang Brooky at Northolt to that effect. He was agreeable, so I left Hendon and stuck to the Great northern Railway track, flying no higher than one hundred feet, until, a little north of Hatfield, the fog disappeared and we ran into perfect weather conditions. We eventually landed at Scampton just after lunch, with everything OK. The new buses were the centre of great attraction, being absolutely

the latest, and we handed them over with feelings of relief.

Less than eight hours after our return, we were in the air again looking for Zepps. Our disappointment was great when we discovered that the new machines were not equipped for operations, for we had hoped to have accomplished something with them. Our chances with the old machines was pretty remote and nothing happened worth recording.

There was one more fatality, Solomon, a New Zealander, went west.

Christmas was approaching and the days were spent mostly in flying our American pupils, practising bomb dropping and machine gunnery. At night it was the same thing, with a bit of searchlight dodging thrown in. There was another casualty too, Livingstone, another New Zealander, side-slipping coming in and crashed, the machine catching fire. Livingstone was a live wire, great on the ivories, and we missed him very much.

C Flight had a nasty accident the same night, a machine landed at one of the emergency grounds, and when taking off, flew straight into a farmhouse, knocking half of it down and giving the poor old farmer and his wife, who were in bed, a rude awakening, in addition to having to dig their way out of the debris in the dark. Fortunately, nothing caught fire, although the pilot was injured beyond recognition.

There was an occasional raid, but our luck was out and we got disheartened, more and more anxious to be off overseas. Christmas passed and still nothing exciting beyond the fact that everyone was blotto and suffered with heads for days afterwards. Boxing Night, things were pretty willing, Brooky and Pad announced just after midnight that they wanted to fly. We all went up to the hangars and got the machines out into the moonlit night without needing the flares. Why someone didn't break his neck is hard to say, for we did all sorts of mad things, and in the end lost Brooky and Pad. We thought they must have forced landed somewhere and carried on until four in the morning. They hadn't turned up then, so we returned to the Mess and saw the break of day whilst sipping cocktails.

About eleven o'clock in the morning, when we were all peacefully sleeping, Brooky and Pad had just awakened and found themselves at Retford aerodrome, where they had gone to see the boys and have a spot. They had been put to bed and knew no more until the morning saw them in fresh surroundings and they thought they'd better let us know. The OC was away when they left, but had a few words to say on their return, and told Brooky, when he did turn up, that the sooner he went overseas the better, to which Brooky heartily agreed.

The funny part of it was that the following morning, orders came through for Brooky and I to report to Adastral House at once. Just what we wanted, and we couldn't pack quickly enough, for we knew it meant overseas for us. This loafing on Home Defence was no good at all; all very well for chaps who had been flying overseas, but not for us. A tender was ordered, and with several rounds of drinks, we said Cheerio to 33 Squadron.

At Adastral House we were given our tickets and told to embark on the seven o'clock train from Victoria the following morning.

We set to and enjoyed our last night in dear old London, and it was some night too. I went over to Portland Place and rounded up some of my nurse friends. Brooky dropped into Selfridge's and picked up a couple of his pals, and we all met back at the Strand Palace, where we fell in with three more chaps we'd been through Oxford with. They were also for overseas duty, so we persuaded them to join our party and bring their lady friends. In the end, we mustered fourteen all told.

Three hours later, we were on the platform at Victoria, no farewells to make, we'd had them all the night before. We staggered into seats aboard the train, made ourselves as comfortable as possible, and as the train pulled out on its way to Folkestone, tried to secure some of the sleep we'd lost the night before. No one spoke, but we all wondered when, if ever, we'd see dear old London again.

Editor's Note: There are a number of inaccuracies and omissions in Reg Kingford's chapter regarding the Squadron losses. He implies that the Squadron lost people in the North Sea, but all fourteen of 33's aircrew, and two groundcrew, fatalities are well documented and all took place on land. 2nd Lt Solomon's crash at Gainsborough occurred on 20 Oct 1917, after which Lt Harman crashed on 17 Nov 1917 at Hibaldstow and 2nd Lt Pinnock crashed on 30 Nov 1917 at Elsham, neither of which are mentioned. One is also led to believe that 2nd Lt Livingstone's crash took place as Christmas was approaching, but Livingstone crashed at Scampton on 12 Jan 1918. Kingford then goes on to say that C Flt suffered an incident the same night, when a machine hit a farmhouse. That crash actually occurred on 15 Aug 1917 up at New Holland and claimed the life of Lt Rowlands. As Kingford remembered the Livingstone crash, yet does not mention the crash at the end of January 1918 that claimed two lives, one can assume that he left for France between 13 and 31 January, which ties in with his daughter-in-law's comment in the report that said that he left for France in January 1918.

APPENDIX 5: OPERATION CHASTISE_16-17 MAY 1943

As OC 106 Squadron, returning from his 173rd sortie and looking forward to leave, Wing Commander Gibson explains in 'Enemy Coast Ahead' explained how Operation Chastise, was revealed to him. SASO had informed him that the AOC wanted Gibson to write a book 'for the benefit of the would-be bomber pilot' and was to report to No.5 Group Headquarters at Grantham the next day. After two days at Grantham, drafting ideas for a book at Grantham Gibson was finally summoned to see Air Vice-Marshal Ralph Cochrane, who congratulated Gibson on the bar to his D.S.O, and then: "...he suddenly said: "How would you like the idea of doing one more trip...a pretty important one, perhaps one of the most devastating of all time. I can't tell you anymore now. Do you want to do it? "

As anyone in an RAF uniform, and the vast majority of the public will tell you, the rest is history. This is how Wikipedia tells the story of the Dambusters Raid.

Background

Before the Second World War, the British Air Ministry had identified the industrialized Ruhr Valley, and especially its dams, as important strategic targets. In addition to providing hydroelectric power and pure water for steel-making, they supplied drinking water and water for the canal transport system. Calculations indicated that attacks with large bombs could be effective but required a degree of accuracy which RAF Bomber Command had been unable to attain when attacking a well defended target. A one-off surprise attack might succeed but the RAF lacked a weapon suitable to the task.

Concept

The mission grew out of a concept for a bomb designed by Barnes Wallis, assistant chief designer at Vickers. Wallis had worked on the Vickers Wellesley and Vickers Wellington bombers and while working on the Vickers Windsor, he had also begun work, with Admiralty support, on an anti-shipping bomb, although dam destruction was soon considered.

At first, Wallis wanted to drop a 10 long ton (22,000 lb, 10.2 tonne) bomb from an altitude of about 40,000 ft (12,200 m), part of the earthquake bomb concept. No bomber aircraft was capable of flying at such an altitude or of carrying such a heavy bomb. A much smaller explosive charge would suffice, if it exploded against the dam wall under the water but German reservoir dams were protected by heavy torpedo nets to prevent a horizontal approach.

Wallis devised a drum-shaped bomb, equivalent to a heavy depth charge armed with a hydrostatic fuse, that

would be spun backwards at over 500 rpm. If dropped at the right low altitude at the correct speed and from the release point, the bomb would skip across the surface of the water before hitting the dam wall. The residual spin would submerge the bomb, running it down the side of the dam toward its base.

The first trials were at Chesil Beach in January 1943, which demonstrated that a bomb of sufficient size could be carried by an Avro Lancaster, rather than waiting for a larger bomber such as the Windsor to come into service. Air Vice-Marshal Francis Linnell at the Ministry of Aircraft Production thought the work was diverting Wallis from the development of the Windsor. Pressure from Linnell via the chairman of Vickers, Sir Charles Worthington Craven, caused Wallis to resign. Sir Arthur Harris, head of Bomber Command, after a briefing by Linnell also opposed the allocation of his bombers. Wallis had written to an influential intelligence officer, Group Captain Frederick Winterbotham, who ensured that the Chief of the Air Staff, Air Chief Marshal Charles Portal, heard of the project. Portal saw the film of the Chesil Beach trials and was convinced. On 26 February 1943, Portal overruled Harris and ordered that thirty Lancasters were to be allocated to the mission and the target date was set for May, when water levels would be at their highest and breaches in the dams would cause the most damage. With eight weeks to go, the larger Upkeep bomb that was needed for the mission and the modifications to the Lancasters had yet to be designed.

Assignment

The operation was given to No. 5 Group RAF, which formed a new squadron to undertake the dams mission. It was initially called Squadron X, as the speed of its formation outstripped the RAF process for naming squadrons. Led by 24-year-old Wing Commander Guy Gibson, a veteran of more than 170 bombing and night-fighter missions, twenty-one bomber crews were selected from 5 Group squadrons. The crews included RAF personnel of several nationalities, members of the Royal Australian Air Force (RAAF), Royal Canadian Air Force (RCAF) and Royal New Zealand Air Force (RNZAF), who were frequently attached to RAF squadrons under the British Commonwealth Air Training Plan. The squadron was based at RAF Scampton.

The targets selected were the Möhne Dam and the Sorpe Dam, upstream from the Ruhr industrial area, with the Eder Dam on the Eder River, which feeds into the Weser, as a secondary target. The loss of hydroelectric power was important but the loss of water to industry, cities and canals would have greater effect and



there was potential for devastating flooding if the dams broke.

The aircraft were modified Avro Lancaster Mk IIIs, known as B Mark III Special (Type 464 Provisioning). To reduce weight, much of the internal armour was removed, as was the mid-upper turret. The dimensions of the bomb and its unusual shape meant that the bomb-bay doors had to be removed and the bomb hung partly below the fuselage. It was mounted on two crutches and before dropping it was spun up to speed by an auxiliary motor.

Preparations

Bombing from an altitude of 60 ft (18 m), at an air speed of 240 mph (390 km/h) and at set distance from the target called for expert crews. Intensive night-time and low-altitude flight training began. There were also technical problems to solve, the first one being to determine when the aircraft was at optimum distance from its target. Both the Möhne and Eder Dams had towers at each end. A special targeting device with two prongs, making the same angle as the two towers at the correct distance from the dam, showed when to release the bomb. (The BBC documentary *Dambusters Declassified* (2010) stated that the pronged device was not used, owing to problems related to vibration, and that other methods were employed, including a length of string tied in a loop and pulled back centrally to a fixed point in the manner of a catapult.)

The second problem was determining the aircraft's altitude, as the barometric altimeters then in use lacked sufficient accuracy. Two spotlights were mounted, one under the aircraft's nose and the other under the fuselage, so that at the correct height their light beams would converge on the surface of the water. The crews practised at the Eyebrook Reservoir, near Uppingham, Rutland; Abberton Reservoir near Colchester; Derwent Reservoir; and Fleet Lagoon on Chesil Beach. Wallis's bomb itself was first tested at the Elan Valley Reservoirs.

The squadron took delivery of the bombs on 13 May, after the final tests on 29 April. At 1800 on 15 May, at a meeting in the house of RAF Scampton's Station Commander, Air Commodore Charles Whitworth, Gibson and Wallis briefed four key officers: the squadron's two flight commanders, Squadron Leader Henry Maudslay and Sqn Ldr H. M. 'Dinghy' Young; Gibson's deputy for the Möhne attack, Flt Lt John V. Hopgood; and the squadron bombing leader, Flight Lieutenant Bob Hay. The rest of the crews were told at a series of briefings the following day, which began with a briefing of pilots, navigators and bomb-aimers at about midday.

Organisation

The squadron was divided into three formations:

Formation No. 1 was composed of nine aircraft in three groups (listed by pilot): Gibson, Hopgood and Flt Lt H. B. 'Micky' Martin (an Australian serving in the RAF); Young, Flt Lt David Maltby and Flt Lt Dave Shannon (RAAF); and Maudslay, Flt Lt Bill Astell and Pilot Officer Les Knight (RAAF). Its mission was to attack the Möhne; any aircraft with bombs remaining would then attack the Eder.

Formation No. 2, numbering five aircraft, piloted by Flt Lt Joe McCarthy (an American serving in the RCAF), P/O Vernon Byers (RCAF), Flt Lt Norman Barlow (RAAF), P/O Geoff Rice and Flt Lt Les Munro (RNZAF), was to attack the Sorpe.

Formation No. 3 was a mobile reserve consisting of aircraft piloted by Flight Sergeant Cyril Anderson, Flt Sgt Bill Townsend, Flt Sgt Ken Brown (RCAF), P/O Warner Ottley and P/O Lewis Burpee (RCAF), taking off two hours later on 17 May, either to bomb the main dams or to attack three smaller secondary target dams: the Lister, the Ennepe and the Diemel.

Two crews were unable to make the mission owing to illness.

The Operations Room for the mission was at 5 Group Headquarters in St Vincents Hall, Grantham. The mission codes (transmitted in morse) were: Goner, meaning "bomb dropped"; Nigger, meaning that the Möhne was breached; and Dinghy, meaning that the Eder was breached. "Nigger" was the name of Gibson's dog, a black labrador retriever that had been run over and killed on the morning of the attack. "Dinghy" was Young's nickname, a reference to the fact that he had twice survived crash landings at sea where he and his crew were rescued from the aircraft's inflatable rubber dinghy

Outbound

The aircraft used two routes, carefully avoiding known concentrations of flak, and were timed to cross the enemy coast simultaneously. The first aircraft, those of Formation No. 2 and heading for the longer, northern route, took off at 21:28 on 16 May. McCarthy's bomber developed a coolant leak and he took off in the reserve aircraft 34 minutes late.

Formation No. 1 took off in groups of three at 10-minute intervals beginning at 21:39.[9] The reserve formation did not begin taking off until 00:09 on 17 May.

Formation No. 1 entered continental Europe between Walcheren and Schouwen, flew over the Netherlands, skirted the airbases at Gilze-Rijen and Eindhoven, curved around the Ruhr defences, and turned north to avoid Hamm before turning south to head for the Möhne River. Formation No. 2 flew further north, cutting over Vlieland and crossing the IJsselmeer before joining the first route near Wesel and then flying south

beyond the Möhne to the Sorpe River.

The bombers flew low, at about 100 ft (30 m) altitude, to avoid radar detection. Flight Sergeant George Chalmers, radio operator on 'O for Orange', looked out through the astrodome and was astonished to see that his pilot was flying towards the target along a forest's firebreak, below treetop level.

First casualties

The first casualties were suffered soon after reaching the Dutch coast. Formation No. 2 did not fare well: Munro's aircraft lost its radio to flak and turned back over the IJsselmeer, while Rice flew too low and struck the sea, losing his bomb in the water; he recovered and returned to base. Barlow and Byers crossed the coast around the island of Texel. Byers was shot down by flak shortly afterwards, crashing into the Waddenzee. Barlow's aircraft hit electricity pylons and crashed 5 km east of Rees, near Haldern. The bomb was thrown clear of the crash and was examined intact by Heinz Schweizer. Only the delayed bomber piloted by McCarthy survived to cross the Netherlands. Formation No. 1 lost Astell's bomber near the German hamlet of Marbeck when he flew his Lancaster into high voltage electrical cables and crashed into a field.

Attack on the Möhne Dam

Formation No. 1 arrived over the Möhne lake and Gibson's aircraft ('G for George') made the first run, followed by Hopgood ('M for Mother'). Hopgood's aircraft was hit by flak as it made its low-level run and was caught in the blast of its own bomb, crashing shortly afterwards when a wing disintegrated. Three crew members successfully abandoned the aircraft, but only two survived. Subsequently, Gibson flew his aircraft across the dam to draw the flak away from Martin's run. Martin ('P for Popsie') bombed third; his aircraft was damaged, but made a successful attack. Next, Young ('A for Apple') made a successful run, and after him Maltby ('J for Johnny'), when finally the dam was breached. Gibson, with Young accompanying, led Shannon, Maudslay and Knight to the Eder. In the attack on the Möhne, one of the bombers made a running commentary on the attack, relayed to base by an airborne TR 1142 (Transmitter Receiver) manufactured by GEC, the distance being too great for direct VHF transmission.

Attack on the Eder Dam

The Eder Valley was covered by heavy fog but not defended. The tricky topography of the surrounding hills made the approach difficult and the first aircraft, Shannon's, made six runs before taking a break. Maudslay ('Z for Zebra') then attempted a run but the bomb struck the top of the dam and the aircraft was severely damaged in the blast. Shannon made another run and successfully dropped his bomb. The final bomb

of the formation, from Knight's aircraft ('N for Nut'), breached the dam.

Attacks on the Sorpe and Ennepe Dams

The Sorpe dam was the one least likely to be breached. It was a huge earthen dam, unlike the two concrete-and-steel gravity dams that were attacked successfully. Due to various problems, only three Lancasters reached the Sorpe Dam: Joe McCarthy (in 'T for Tommy', a delayed aircraft from the second wave) and later Brown ('F for Freddie') and Anderson ('Y for York'), both from the third formation. This attack differed from the previous ones in two ways: the 'Upkeep' bomb was not spun, and due to the topography of the valley the approach was made along the length of the dam, not at right angles over the reservoir.

McCarthy's plane was on its own when it arrived over the Sorpe Dam at 00:15 hours, and realised the approach was even more difficult than expected: the flight path led over a church steeple in the village of Langscheid, located on the hillcrest overlooking the dam. With only seconds to go before the bomber had to pull up, to avoid hitting the hillside at the other end of the dam, the bomb aimer George Johnson had no time to correct the bomb's height and heading.

McCarthy made nine attempted bombing runs before Johnson was satisfied. The 'Upkeep' bomb was dropped on the tenth run. The bomb exploded but when he turned his Lancaster to assess the damage, it turned out that only a section of the crest of the dam had been blown off; the main body of the dam remained.

Three of the reserve aircraft had been directed to the Sorpe Dam. Burpee ('S for Sugar') never arrived, and it was later determined that the plane had been shot down while skirting the Gilze-Rijen airfield. Brown ('F for Freddie') reached the Sorpe Dam: in the increasingly dense fog, after 7 runs, Brown conferenced with his bomb aimer and dropped incendiary devices on either side of the valley, which ignited a fire which subsequently lifted the fog enough to drop a direct hit on the eighth run. The bomb cracked but failed to breach the dam. Anderson ('Y for York') never arrived having been delayed by damage to his rear turret and dense fog which made his attempts to find the target impossible. The remaining two bombers were then sent to secondary targets, with Ottley ('C for Charlie') being shot down en route to the Lister Dam. Townsend ('O for Orange') eventually dropped his bomb at the Ennepe Dam without harming it.

Bomb damage assessment

Bomber Command wanted a bomb damage assessment as soon as possible and the CO of 542 Squadron was informed of the estimated time of the attacks. A photo-reconnaissance Spitfire, piloted by Flying Officer Frank "Jerry" Fray, took off from RAF Benson at 07:30 hours and arrived over the Ruhr River immediately after first



© Hulton-Deutsch Collection/CORBIS



light. Photos were taken of the breached dams and the huge floods. The pilot later described the experience:

“When I was about 150 miles from the Möhne Dam, I could see the industrial haze over the Ruhr area and what appeared to be a cloud to the east. On flying closer, I saw that what had seemed to be cloud was the sun shining on the floodwaters. I looked down into the deep valley which had seemed so peaceful three days before but now it was a wide torrent. The whole valley of the river was inundated with only patches of high ground and the tops of trees and church steeples showing above the flood. I was overcome by the immensity of it.” (Jerry Frey)

After the raid

Three aircrew from Hopgood's aircraft parachuted but one later died from wounds and the others were captured. A crewman in Ottley's aircraft survived its crash. In total, therefore, 53 of the 133 aircrew who participated in the attack were killed, a casualty rate of almost 40 percent. Thirteen of those killed were members of the RCAF and two belonged to the RAAF.

Of the survivors, 34 were decorated at Buckingham Palace on 22 June, with Gibson awarded the Victoria Cross. There were five Distinguished Service Orders, 10 Distinguished Flying Crosses and four bars, two Conspicuous Gallantry Medals, eleven Distinguished Flying Medals and one bar.

Initial German casualty estimates from the floods were 1,294 killed, including 749 French, Belgian, Dutch and Ukrainian prisoners of war and labourers. Later estimates put the death toll in the Möhne Valley at about 1,600, including people who drowned in the flood wave downstream from the dam. After a public relations tour of America, and time spent working in the Air Ministry in London writing the book published as *Enemy Coast Ahead*, Gibson returned to operations and was killed on a Mosquito operation in 1944.

Following the Dams Raid, 617 Squadron was kept together as a specialist unit. A motto, ‘Après moi le déluge’ (‘After me the flood’) and a squadron badge were chosen. According to Brickhill there was some controversy over the motto, with the original version *Après nous le déluge* (“After us the flood”) being rejected by the Heralds as having inappropriate provenance (having been coined, reportedly, by Madame de Pompadour) and *après moi le déluge* having been said by Louis XV in an “irresponsible” context. The motto having been chosen by King George VI, the latter was finally deemed acceptable. The squadron went on to drop the Tallboy and Grand Slam bombs and attacked the German battleship *Tirpitz*, using an advanced bomb sight, which enabled the bombing of small targets with far greater accuracy than conventional bomb aiming techniques.

In 1977, Article 56 of the Protocol I amendment to the Geneva Conventions, outlawed attacks on dams “if such attack may cause the release of dangerous forces from the works or installations and consequent severe losses among the civilian population”. There is however an exception if “it is used for other than its normal function and in regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support”.

Tactical view

The two direct mine hits on the Möhnesee dam resulted in a breach around 250 feet (76 metres) wide and 292 feet (89 metres) deep. The destroyed dam poured around 330 million tons of water into the western Ruhr region. A torrent of water around 32.5 feet (10 metres) high and travelling at around 15 mph (24 km/h) swept through the valleys of the Möhne and Ruhr rivers. A few mines were flooded; 11 small factories and 92 houses were destroyed and 114 factories and 971 houses were damaged. The floods washed away about 25 roads, railways and bridges as the flood waters spread for around 50 miles (80 km) from the source. Estimates show that before 15 May 1943 water production on the Ruhr was 1 million tonnes; this dropped to a quarter of that level after the raid.

The Eder drains towards the east into the Fulda which runs into the Weser to the North Sea. The main purpose of the Edersee was then, as it is now, to act as a reservoir to keep the Weser and the Mittellandkanal navigable during the summer months. The wave from the breach was not strong enough to result in significant damage by the time it hit Kassel (approx. 35 km downstream).

The greatest impact on the Ruhr armaments production was the loss of hydroelectric power. Two power stations (producing 5,100 kilowatts) associated with the dam were destroyed and seven others were damaged. This resulted in a loss of electrical power in the factories and many households in the region for two weeks. In May 1943 coal production dropped by 400,000 tons which German sources attribute to the effects of the raid.

According to an article by German historian Ralf Blank, at least 1,650 people were killed: around 70 of these were in the Eder Valley, and at least 1,579 bodies were found along the Möhne and Ruhr rivers, with hundreds missing. 1,026 of the bodies found downriver of the Möhne Dam were foreign prisoners of war and forced labourers in different camps, mainly from the Soviet Union. Worst hit was the city of Neheim (now part of Neheim-Hüsten) at the confluence of the Möhne and Ruhr rivers, where over 800 people perished, among them at least 493 female forced labourers



Waterspouts shot 1,000 ft. up as Lancasters swooped with sea mines on giant dams.

Escaping torrents devastate vast war producing area, wreck railways and bridges.

FLOODS ROAR DOWN RUHR VALLEY

THE BREACH: R.A.F. took this amazing picture yesterday

Fliers see 30ft. wave LIKE A NEW INLAND SEA—AND STILL SPREADING FAST

Express Air Reporter BASIL CARDEW

RECONNAISSANCE planes which flew over Germany yesterday brought back photographic proof that rail and road bridges in the Ruhr had been washed away and that floods were spreading fast in the Dortmund area following the destruction by the R.A.F. of the Mohne and Eder Dams and the attack on the Sorpe Dam early in the morning.

DAM BUSTER-IN-CHIEF



WING COMMANDER GUY PENNINGTON, leader of the raid on the dams, is seen in his command plane yesterday.

Hydro-electric power stations are destroyed or damaged. A railway marshalling yard is under the water which is sweeping down the Ruhr valley.

The floods from the Eder Dam, bearing down on Kassel and its 180,000 people, are already as great as those in the Ruhr valley, but the country there is flatter, and they are likely to cover a wider area.

The attack was one of the most devastating of the war. Lancasters dropped sea mines in Germany's two greatest reservoirs, smashing great breaches in the dams and washing torrents of flood water into the lowest industrial area of Europe. Dortmund, with a population of about 440,000, is only 20 miles from the Mohne Dam; another 40 miles, Eder 67.

Boats blasted a lane 100 yards wide in the thick and jagged, dark on the Continent, and a volume of water deeper than the height of Lake Wundereg was poured out on to the sea and villages.

TRAINED IN SECRET

The men who did the job had been trained for weeks for this new type of raid. They had been secretly practising with dummy dams, and the attack was planned as such, after dropping false reports, would be taken towards the mouth of the Ruhr by the following night.

Led by Wing Commander Guy Pennington, O.B.E., D.F.C., and led—on one of the Bomber Command—they arrived over the Mohne and Eder reservoirs an hour or two after midnight. Their object was to cause as much wreckage as could be done by thousands of tons of bombs dropped in a series of ordinary-looking night raids.

The Lancaster then made the attack from 100 feet, and the water spouted 1,000 feet into the air. One wave, 30 ft. high, roared through the valley where the Eder Dam gate was.

Wing Commander Pennington personally led the attack on the Mohne Dam. A Right-Handed, and "I was able to watch the whole process. The wing commander's boat was blown 200 feet, and a number of boats were up 100 feet. A second Lancaster crashed with equal success for there was still the job to be done. There was a third attack, and the water was still rising. The dam was completely destroyed, and the water was still rising. The dam was completely destroyed, and the water was still rising.



1,000 water-clogged Mohne Dam. In the R.A.F. picture, it had a capacity of 20,000,000 gallons, was an active one, the water main-line passing through a 300-foot breach. The reservoir on the right side of the dam, in the top half of the picture, has been drained of most of its content, but water is still rising through.

THE DAM BEFORE THE RAID



1,000 FT. HIGH

300 YARDS DEEP, ONE

A German advised the R.A.F. to do it

Industry crippled for months

A FAMOUS German-Jewish medical specialist, exiled to Lienz, Austria, and now practicing in Britain, suggested the great raid to the R.A.F.

Dr. Leo Baeck, who has been advised to suggest the great raid to the R.A.F.

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FIRED BACK

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Commando secrets revealed NAZIS MASSACRED TODT WORKMEN

Express Military Reporter

SECRETS of the Commandos are revealed today—discussing details of actions they have fought and weapons they have won.

These are the official disclosures of their great raids—

1. The Commandos are trained in the most secret places, and their training is the most advanced in the world.

2. The Commandos are trained in the most secret places, and their training is the most advanced in the world.

3. The Commandos are trained in the most secret places, and their training is the most advanced in the world.

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Ciano sees the Pope

MADRID, Monday.—Crown Prince Umberto has taken the place of King Victor Emmanuel at meetings of the Italian Supreme War

4 A.M. LATEST

LONDON BOMBS THIS MORNING

London tonight was again a target for German bombers, which were seen over the city at intervals during the night.

VERBOTEN: NEWS ABOUT DAMS

The British Government has forbidden the publication of news about the results of the dam-raiding operations.

DAVIES IN RUSSIA

Mr. Arthur Davies, a British pilot, is reported to have been seen in the Soviet Union.

No distinction

The British Government has declared that there is no distinction between the Axis powers.

Explosive lipstick

A new type of lipstick, containing explosive material, has been developed by the British.

F.D.R. to Stalin: More successes

President Roosevelt has announced that the Allies have achieved more successes in the war.

10th Army change

The 10th Army has been reorganised to meet the demands of the new campaign.

Mackenzie King goes to U.S.

Prime Minister Mackenzie King has departed for the United States to discuss the war effort.

Prisoners taken

A large number of German prisoners have been taken by the British forces.

Liberators hit Bordeaux

British Liberators have bombed Bordeaux, causing damage to the city.

U-crew surrender

The crew of a German U-boat has surrendered to the British.

7-1 WIN

The British have won a 7-1 victory in a recent match.

Japan gas lie

The Japanese Government has denied reports that it is producing gas.

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from the Soviet Union. (Some non-German sources erroneously cite an earlier total of 749 for all foreigners in all camps in the Möhne and Ruhr valleys as the casualty count at a camp just below the Eder Dam.

After the operation Barnes Wallis wrote, "I feel a blow has been struck at Germany from which she cannot recover for several years", but on closer inspection, Operation Chastise did not have the military effect that was at the time believed. By 27 June, full water output was restored, thanks to an emergency pumping scheme inaugurated the previous year, and the electricity grid was again producing power at full capacity. The raid proved to be costly in lives (more than half the lives lost belonging to Allied POWs and forced-labourers), but was no more than a minor inconvenience to the Ruhr's industrial output. The value of the bombing can perhaps at best be seen as a boost to British morale. Critics believed the raid was oversold, its achievements exaggerated and other Bomber Command raids unfairly ignored.

In his book *Inside the Third Reich*, Albert Speer acknowledged the attempt: "That night, employing just a few bombers, the British came close to a success which would have been greater than anything they had achieved hitherto with a commitment of thousands of bombers." He also expressed puzzlement at the raids: the disruption of temporarily having to shift 7,000 construction workers to the Möhne and Eder repairs was offset by the failure of the Allies to follow up with additional (conventional) raids during the dams' reconstruction, and that represented a major lost opportunity. Barnes Wallis was also of this view; he revealed his deep frustration that Bomber Command never sent a high-level bombing force to hit the Möhne dam while repairs were being carried out. He argued that extreme precision would have been unnecessary and that even a few hits by conventional HE bombs would have prevented the rapid repair of the dam which was undertaken by the Germans.

The effect on food production was more significant, with many square kilometres of arable land being washed away and effectively unusable until the 1950s. There was also a great loss of farm animals bred for food.

Strategic view

The Dams Raid was, like many British air raids, undertaken with a view to the need to keep drawing German defensive effort back into Germany and away from actual and potential theatres of ground war, a policy which culminated in the Berlin raids of the winter of 1943–1944. In May 1943 this meant keeping the Luftwaffe aircraft and anti-aircraft defences away from the Soviet Union; in early 1944, it meant clearing the way for the aerial side of the forthcoming Operation

Overlord. The considerable amount of labour and strategic resources committed to repairing the dams, factories, mines and railways could not be used in other ways, on the construction of the Atlantic Wall, for example. The pictures of the broken dams proved to be a propaganda and morale boost to the Allies, especially to the British, still suffering from the German bombing of the Baedeker Blitz that had peaked roughly a year earlier.

An effect of the dam raids was that Barnes Wallis's ideas on earthquake bombing, which had previously been rejected, came to be accepted by 'Bomber' Harris. Prior to this raid, bombing had used the tactic of area bombardment with many light bombs, in the hope that one would hit the target. Work on the earthquake bombs resulted in the Tallboy and Grand Slam weapons, which caused damage to German infrastructure in the later stages of the war. They rendered the V-2 rocket launch complex at Calais unusable, buried the V-3 guns, and destroyed bridges and other fortified installations, such as the Grand Slam attack on the railway viaduct at Bielefeld. Most notable successes were the partial collapse of 20 ft (6.1 m), reinforced concrete roofs of U-boat pens at Brest, and the sinking of the battleship Tirpitz.

Harris regarded the raid as a failure and a waste of resources.

The Benson Link

After the Raid Bomber Command wanted a complete bomb damage assessment as soon as possible, and CO of 542 PRU Squadron at RAF Benson, Squadron Leader D. Sawley, was informed of the estimated time of the attacks. The pilot of the Spitfire PR IX that captured the iconic pictures of the Möhne, Flying Officer Jerry Fray, later recalled his experience and view from 30,000 feet over the target area:

"When I was about 150 miles from the Möhne Dam, I could see the industrial haze over the Ruhr area and what appeared to be a cloud to the east. On flying closer, I saw that what had seemed to be cloud was the sun shining on the floodwaters. I looked down into the deep valley which had seemed so peaceful three days before [on an earlier reconnaissance mission] but now it was a wide torrent with the sun shining on it. Twenty five miles from the Ruhr the whole valley of the river was inundated with only patches of high ground and church steeples which I had seen as part of the landscape a few days before, showing above the flood water. The even flow was broken as it rushed past these obstacles. As I came nearer the dam I could see that the water was about a mile wide. I was overcome by the immensity of it and when I realized what had happened I just wondered if the powers that be realized just how much damage had been done. The Ruhr was covered

with haze and when I broke clear of this, I began my photography, moving up towards the dam. It was easy to pinpoint because the breach showed up, and I could see the water rushing through. The control house at the foot of the damn, which I had seen two days before had disappeared. The level of the water above the damn had fallen, leaving huge tracks of dark brown mud around the edges. This was eight hours after the bombing.”

Churchill was quick to recognise the immense propaganda value of the photographs taken by Jerry and allowed them to be published in the papers. Two more flights were made by 542 Squadron over the dams after Fray’s flight that day. One of them was flown by Flt Lt Gordon Puttick. By now the Germans were at a high state of alert and wary of follow up attacks and reconnaissance. This added a higher risk element to these PR flights, the pilots relying on the speed and height in their unarmed aircraft over enemy territory to bring them home safely.

Although not one to speak much about his experience Jerry did provide an interview with the Sunday Telegraph in 2001. The PR pilots, often not in the lime light, were a breed apart and should not be forgotten. Flying Spitfires fitted with long range tanks, often sorties lasting several hours in cramped conditions these men endured freezing temperatures and considerable discomfort to bring back much needed target information. Not only were they operating on the margins of performance but also in unarmed aircraft, the hope being that with lighter weight the aircraft could out run and fly higher altitudes than the Luftwaffe could reach by the time the Spitfire was over its intended target.

ACM Sir Neil Wheeler was later to comment about his early PR experiences:

“Frankly, I found the extreme cold most uncomfortable. On my feet I wore a pair of ladies silk stockings, a pair of football stockings, a pair of oiled Scandinavian ski socks and RAF fur lined boots. On my hands I wore two pairs of RAF silk gloves and some special fur backed and lined

gauntlets which I had to buy for myself, it was essential to maintain some fingertip control, particularly for the camera control box.

Jerry’s identity was only revealed in 2001 by the RAF. He was born in Bristol, the eldest of three children, and was educated at the City of London Freeman’s School in Ashted, Surrey. With war imminent in 1938, Jerry’s parents were not enthusiastic about his desire to become a pilot so he volunteered for the army and joined the Royal Engineers. Shortly after the outbreak of war, he was sent to France and attached to the No. 4 Squadron at Mons en Chaussée. Evacuated from Dunkirk in 1940, Jerry was transferred to the RAF for pilot training shortly afterwards. His early flying training was at the No. 4 Elementary Flying Training School in Brough, followed by advanced training at the No. 9 Service Flying Training School in Hullavington, where he gained his pilot wings and was commissioned into the RAF in January 1942.

Electing for special duties, Jerry undertook specialist navigation training before flying unarmed Spitfires at RAF Benson. With his photography of the Möhne dam immortalising the exploits of the Dambusters, Jerry was awarded the Distinguished Flying Cross and later the Belgian Order of Leopold and Belgian Croix de Guerre (with palm) for photographic work to help the Belgian resistance.

After two successful operating tours, and with the war ending, Jerry was posted to India to command No. 34 Squadron at Palam, Delhi. After the partition of India he joined No. 80 Squadron in Germany, still flying Spitfires, but in a tactical role. Then followed a period as a regular officer with No. 613 (City of Manchester) Squadron RAuxAF, and two and a half years in Greece with the RAF Mission. Twelve months at the Staff College at RAF Bracknell preceded various staff appointments at Fighter Command and RAF HQ in Germany. Squadron Leader Jerry Fray DFC retired in 1963 and died on 26 June 2003.



APPENDIX 6: WILLIAM ROSE & SON – FROM TOBACCO TO TURRETS

The Early Days

William Rose owned the house that 33 Squadron made its HQ in October 1916. He was something of a boy prodigy – a riveter's assistant at the age of eleven, he then became a barber's assistant. It was during his time in the barber's shop that William first saw the need to sell tobacco in packets. When a customer called for tobacco, the lather-boy had to dry his hands and run to the counter to weigh it out hand and wrap it and he wondered why it could not be sold in packets instead of loose. He resolved to make a Tobacco packaging machine.

Entirely self-taught – in his bedroom until late into the night and at weekends, he taught himself the rudiments of mechanical drawing, applied mechanics, mathematics and all the other skills required to develop complex mechanisms - he devised a machine that could quickly wrap half-ounces of loose tobacco into neat cylindrical packages. Trained engineers of later generations marvelled at his ambition and tenacity. It was said that he could hardly have started with a commodity more difficult to pack than tobacco. Sweet wrapping machines are much simpler mechanisms than the original tobacco packer with which William Rose "established the basic principles of automatic wrapping of later years". His original wrapping machine, for which he took out a provisional patent in 1881, was looked on as something of a miracle, tobacco being the first commodity to be mechanically wrapped for sale.

After becoming owner of the barber's shop, he continued to work at his models – "with neither equipment or resources, only mechanical problems, financial troubles – and heaps of ridicule". It took seven years of effort before he completed a machine that did what he wanted, and he took it to the old-established tobacco firm of Wills in Bristol. This proved a very wise move as in their joint names, a patent was taken out in 1885 (Wills later renounced all claims to the patent rights).

ENTERING THE EXPORT MARKET

A chance visit to a London tobacconist by an American who was taken aback by the sight of a pile of Rose's neatly wrapped packages, started William on a whirlwind development that involved Richard Harvey Wright (the American visitor), agreeing a contract which gave him exclusive right to sell, manufacture, lease on royalty and otherwise handle the Rose Tobacco Packer in the USA, Canada and Cuba. A clause in the contract required William to adapt his machine to produce rectangular packets for the American

market and soon, William Rose had grown out of the premises formed from two bedrooms knocked into one and had fifty men on his payroll in a new factory built on the banks of the River Trent.

The Company Is Formed

By 1905 he had sold machines to the value of over £36,000, his profits for the year topping £3,000. In 1906, William and his brother incorporated themselves as Rose Brothers (Gainsborough) Ltd. Within a few years, Rose began to apply the principle of this machine to the wrapping of other products. Rose Packaging machines were to be found in chocolate and confectionery, bakery, biscuit and tea factories.

He was able to develop a cigarette packer and was approached by John Mackintosh of Halifax with an experimental twist-wrapping machine for confectionery which he perfected and was then allowed to exploit (The early machines were for toffee sized by hand and fed into the cut and wrap machine). He set aside a special section of his works to manufacture cartons for Reckitt & Sons of Hull. This operation grew rapidly and William formed the National Folding Box Company with his son-in-law as manager.

World War One

As well as receiving a contract for Gun Sights and Breech Blocks for 'Q' ships, and producing large quantities of 12-pounder shells for the Army., Rose was awarded a contract for the Royal Flying Corps for synchronisation equipment, requiring high precision in design and manufacture, that allowed the air gunner to fire through the aircraft's moving propeller blades.

William Rose had a poor impression of those responsible for equipping warplanes in WW1. The Royal Flying Corps were dropping their bombs from the fuselage by guesswork and William had invented a bombsight to increase the chance of hitting the target. He submitted the invention to the authorities whose response was to ask if such gadgets were really necessary. The design was not taken up. It is said that RAF aircrews that looked at the bombsight during WW2 – it was designed for aircraft having an air speed of 130 mph - declared it to be far ahead in technical design to the one that the RAF had been using in 1939.

The justification for William Rose's desire to develop a bomb sight is claimed to be: "A locally-based Royal Flying Corps unit had dropped some water-filled balloons round his home - Highfield House - one of which hit the stable roof dislodging a slate which fell and narrowly missed his gardener".

William Rose had taken the sight to the appropriate

Ministry in London but brought it home and heard nothing more. It was not until some years later that he discovered that the gentleman who had interviewed him had himself invented a bomb sight!

The bomb sight surfaced again during WW2. T.H. Phillipson recalls -

"During the last war (WW2), we used the Red Hall (a very large house in Lord Street, now demolished) as a pattern store. When clearing one of the cellars, my attention was drawn to a small heap of rusted metal which I just could not identify. I took it down to the Works to Alfred Rose who, when he saw it, became very excited and identified it as William Rose's bomb sight.

I had it cleaned up and put in a glass case in Alfred Rose's office until after I retired. I believe it is now in the possession of one of the Rose family".

William Rose died in 1929 and Rose Brothers was left in the very safe hands of his son, Alfred who ran the company successfully for 28 years but very much in his own way.

World War Two

Some of Alfred Rose's finest hours could be said to have come during the dark days of WW2. His father had earned a reputation for accepting orders for machines irrespective of how difficult they might be to execute, and with little worry whether or not they would earn a normal profit. He was much more concerned with retaining his highly skilled craftsmen and achieving high engineering standards and thus he was able to turn with confidence to the production of war materials.

Augustus Muir's "History of Baker Perkins" states that while the company expended considerable energy and ingenuity towards developing pom-pom directors, gun sights, trench mortar and Stiffkey sights, breech loading mechanisms and many other items, it was in their swift reaction to problems brought to them by a continuous stream of RAF personnel who were made welcome at the Gainsborough factory, including Air Chief Marshal Arthur 'Bomber' Harris, Guy Gibson and Leonard Cheshire, that they excelled.

In the early part of the War, the Hampden twin-engined bomber was a key part of Bomber Command's armoury. However, to quote Air Chief Marshall Harris - "The Hampden was then a most feebly armed aircraft with a single gun on top and a single one underneath, manned by a gunner in a hopelessly cramped position, together with a gun firing forward which, as it was fixed, was of no use at all. The mounts of the two moveable guns were rickety and had a limited traverse with many blind spots".

It took Rose Brothers - in Harris's words - "A typically

English family firm the sort of firm which can do anything without any fuss and with a comparatively minute staff in the design and drawing office" - no more than a fortnight to produce designs for gun mountings that effectively doubled the fire power of the Hampden and eliminated all blind spots. In a few weeks, the mountings were in full production and going into action.

Over a thousand modified gun mountings were made for the rear turret of the Hampden bomber - which transformed its performance. Tom Greatorex of the fitting shop at Gainsborough recalled these early mountings:

"The gun was mounted on a rail with pegs inserted in holes to give the gun five firing positions. This was superseded by the Mk 2 that worked on rollers but moved by hand to cover an arc of 180 degrees. Later a small motor was added to make the gun fully automatic".

Tobin Jones adds - "I have some pictures of the Hampden Rose mount somewhere. It was an "I" section steel track, toothed on the inside and with an electric motor that traversed the gun mount left or right (180 degrees) by the use of a pair of push button Bakelite switches which drove the motor left or right. I believe that these were only fitted to the upper turret. They were produced at the request of a squadron commander and bypassed the normal time consuming official procurement system with the bill going to the squadron commander. When Harris, boss of Bomber Command was asked to approve the payment he did so without demur as he knew Rose Bros."

A Hampden bomber returned to RAF Hemswell with one of its wings half cut away having collided with a barrage balloon cable. How it got home, no-one could understand. The RAF immediately asked Rose to design some means of cutting barrage balloon cables and an attachment which was let into the leading edge of the wing was soon drawn up. It was flared to guide the cable into a slot and trigger off an explosive device that drove a sharp chisel against an anvil and so severed the cable. Rose manufactured a quantity of these and they were said to be very effective. Tobin Jones adds: "The balloon cable cutters were later produced en masse for all the numbers by Boulton and Paul and they take credit for their design! I have one somewhere! I believe that Rose also made the ad hoc modification that allowed a Vickers VGO machine gun to be mounted either side of the mid fuselage of the Hampden. It was a nicely made steel box that spread the shock load across the soft skin via a steel spreader plate. These were fitted to most Hampdens by 1941".

Another very useful item of equipment designed and produced by Rose Brothers was the oxygen economiser. Oxygen was stored under pressure in the

aircraft in metal cylinders and when in use quite a lot went to waste, the only part used being that breathed in by the crew member. The economiser was a rectangular container containing about the amount of oxygen needed for one breath. It filled, then a valve closed off the supply and only opened after the crew member had emptied it by breathing in, via his oxygen mask. Alfred Rose established a number of 'dispersal' factories in local villages to produce this equipment.

The Lancaster and an Introduction to Rod-End Bearings

The Rose Brothers' introduction to the bearings industry also took place in WW2. In 1944-45, many Lancaster bombers were crashing before they could reach their home stations. The courts of enquiry in to these crashes established that most of them crashed owing to shortage of fuel and this, despite the fact that the reserve tanks were full. The RAF found defects in a linkage arrangement governing the changeover from the main petrol tank to the auxiliary tank in the Lancaster bomber. The linkage was fitted with spherical bearing rod ends that failed to stand up to the vibrations in the aircraft. The rod ends then in use were standard aircraft parts, made to Air Ministry specifications, and they comprised an outer housing of steel and a spherical inner of soft self-lubricating material. The failures arose from the wear or collapse in service of the inner member.

Because of its strong relationship with the RAF, Rose Brothers was approached to make something more durable and efficient. Rose selected better materials – an alloy steel for the outer casing and a high quality hardened steel for the inner component – both materials being suitable for precision grinding of the mating surfaces. This combination of better materials and precision engineering proved to be the complete answer and many thousands of Rose rod-ends were supplied to the RAF.

ROSE BROTHERS AND THE DAMBUSTERS

Rose's links with RAF Scampton were almost as close as with RAF Hemswell and Guy Gibson, Leonard Cheshire and others were frequent visitors to the Albion Works. Gainsborough was also said to have made parts for the Lancasters that carried out the Dam Buster raid. The story of this is told in length by Augustus Muir in his chapter on "Equipping the Services".

"After this," said a Rose executive, "our works in Gainsborough seemed to become an extension of the Air Force workshops in No. 5 Bomber Group. Albion Works and our sportsground were always open house to anyone in the RAF. Time and again, on the urgent call of the Station Engineer at Scampton, the men would work non-stop until the job was completed. When they came to manufacture new 'details' for the

Lancaster Bombers, it was evident that something big was in the wind. 'Finally one morning,' wrote a member of the firm, 'we heard over the BBC's 7 o'clock News Bulletin the report of a mission that became famous as one of the outstanding exploits of the War, the Dambusters raid. About 8 o'clock, the Station Engineer at Scampton phoned through to us. He said simply: 'Tell the lads, that was their job!' We put the news out on our loudspeaker system all over the works, and I will never forget the thrill which it created." To this day it is not known which parts of the Dambuster's 'special' equipment might have been made at Rose Brothers.

Because of the size of the "bouncing bomb", the Lancaster's huge bomb doors were replaced with fairings. Vickers at Burhill, were responsible for the two large attachment arms holding the weapon in the Lancaster's bomb bay and the driving mechanism that imparted the necessary 500 rpm of backspin just prior to release. It was planned that 30 aircraft should be modified but, in the event, 19 Lancasters set out on the raid.

After the raid, Gainsborough was visited by Guy Gibson and a number of the aircrew, complete with their new medals.

THE ROSE TURRET

Sir Arthur 'Bomber' Harris was appointed Commander-in-Chief of RAF Bomber Command in February 1942 and one of his key concerns throughout his tenure was the limited fire-power of the Lancaster's gun-turrets. The .303 guns were usually loaded with 30% incendiary, 60% armour-piercing and 10% tracer bullets that in practice were of little use against armour plate, a



A Rose turret fitted to a Lancaster.

problem not solved by the Air Ministry before 1945.

Sir Arthur Harris was quoted as saying – "Later in the war, Roses, that is Alfred Rose himself, Curtis the designer and Fred the foreman – were again to pull us out of the soup with a beautifully designed and made 0.5inch turret" – this was the famous 'Rose Turret', an example of which can be seen at the Royal Aircraft Museum at Hendon. A slightly different version of the story suggests that Air Vice-Marshal Sir Edward Rice and Alfred Rose collaborated on the design of the new turret. "Despite a lack of official interest", Rice went ahead and helped Rose with the winning design, the Air Ministry placing an initial production order for the turret in June 1943. Work had started on the design and development of the turret on late 1943/early 1944. Production began in 1944 after a few prototypes had been tested and modified, mainly to eliminate vibration. Two turrets were fitted to No. 101 Squadron Lancasters in May 1944 at Ludford Magna; and ten turrets were produced by June 1944 after which production was steadily improved. Although over seven thousand Lancaster bombers were built during the war, most were equipped with Frazer-Nash hydraulically operated tail turrets, fitted with four .303 calibre machine guns. Only 227 Lancasters, according to the RAF Museum, Hendon (see below), were fitted with Rose turrets. This might not seem many but it was a fantastic achievement in such a short time, especially by a firm that, prior to the war, had not been involved in this type of work. Rose Brothers developed a strong relationship with the personnel of RAF Hemswell (just east of Gainsborough and 14.5 miles north of Lincoln) and it was here that the Rose turret was fitted to the Lancasters of No. 150 Squadron, No 1 Group, Bomber Command, in November 1944. It is understood that Rose Turrets were also fitted to Lancasters of No. 83 Squadron (a Pathfinder squadron), No. 170 Squadron and No. 1662 Heavy Conversion Unit. It is claimed that a Lancaster fitted with a Rose Turret was the first to shoot down an armoured German night-fighter.

The Rose Turret was designed to a very exacting specification with, as quoted in the June 1980 issue of 'Air International', "The fundamental principle of the Rose turret was to keep down to a minimum the length of time between spotting the target and bringing the guns to bear on it. Instead of a gunner having to search the sky and then swing his guns onto the target with the Rose turret he searched for his target by looking directly through his reflector sight. The reflector sight was strengthened so that the gunner held the sight itself and used it to control the turret. As a result, the gunner was able to press the firing button immediately he spotted the target through the sight.

The turret cupola was specially designed to give a clearer view - it was even possible to see vertically

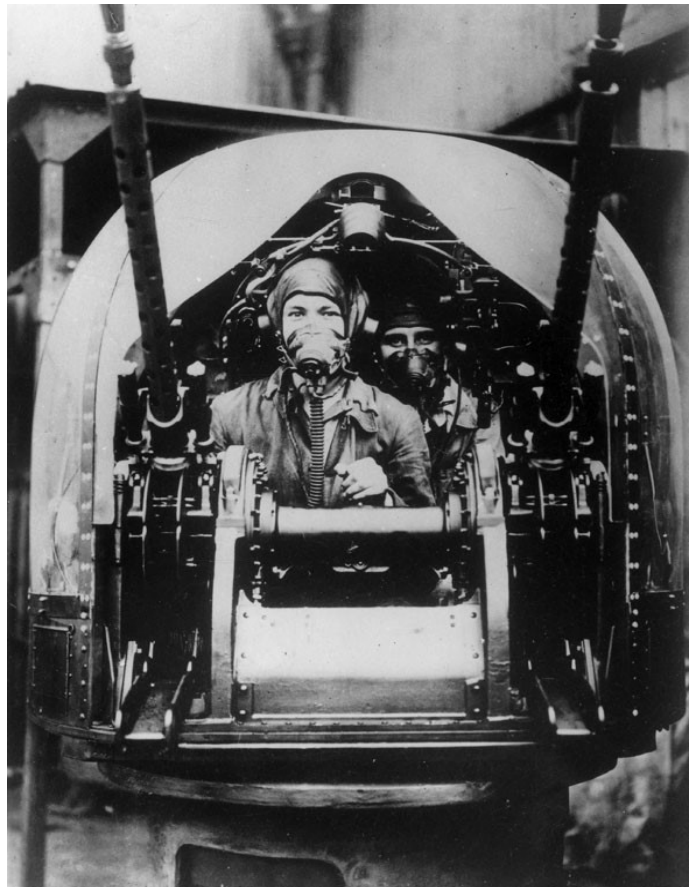
downwards and, with the turret dead astern, to see both wingtips of the aircraft. As the outward end of the turret was open, a gunner was able to 'bale out' by diving directly between the guns which were spaced widely apart to allow this. A great deal of space inside the turret was included in the design to give the gunner more room. There was, in fact, enough room for two people inside the turret at the same time".

Such was the simplicity of the controls that little additional training was needed and the new turrets proved popular with the gunners. Another radical design feature - the open front - overcame frosting which was a severe problem, especially on night operations. It is perhaps surprising to learn that the difference in temperature between an open and closed cupola facing to the rear, was only a few degrees.

An assembly line system was used for production, which involved 14 stages of assembly. Time to assemble each turret was about seven working hours. Just over 200 turrets were delivered to the RAF before production ceased at the end of the war. A type 'R' turret could be fitted to a Lancaster without any alteration to the existing mounting within 3½ hours.

The shape of the turret meant that the slipstream was not pulled back into the gunner's face. The Turret was more roomy and it was no longer necessary for the gunner to leave his parachute in the fuselage - wasting precious minutes in the event of having to bale out.

There was even space for two men in the Turret but this was not, of course, an operational requirement.



The spacing of the guns allowed maximum elevation and depression, improved access for servicing and allowed the gunner to bail out through the direct-vision aperture. There was little of the very vulnerable tail area of the Lancaster that the gunner could not cover.

The turret contained twin mounted 0.5" Browning Automatic machine guns, three hundred and fifty rounds per gun, with an effective range of six hundred and fifty yards. The heavy guns were for daylight use, as the limited visibility at night made their longer range ineffective compared to the more rapid fire of the .303 Brownings. It used a Barr & Stroud Mk IIIA reflector sight with a traverse of +/- 94 degrees, elevation 49 degrees and a depression of 59 degrees and allowed for a total firing time of 24 seconds, compared with the 130 seconds firing time for the four-gun Frazer-Nash turret). It was fully hydraulically operated, and therefore easily manoeuvrable. Should the plane be damaged and the order to bale out given, all the rear gunner had to do was to fall through the hole in which his gun manoeuvred. This in itself saved many lives. Ted Beswick of the heavy machine shop at Gainsborough flew in a Rose turret as rear gunner: "It had more room than in other types and it was possible to wear a back type parachute and so bale out of the turret. It was, however, very cold due to the cut-away Perspex, which left the turret completely open. This made for better vision but it was necessary to wear four pairs of gloves. One also had to be careful when entering the turret not to catch one of the control rods with the right foot, causing turret rotation. The turret was controlled by grasping a control box with both hands (this was about four inches square and set at about eye level) and also carried the reflector sight and firing button. By moving the control to the left, the turret swung to the left, and so on. Ammunition was stored in side the rear of the turret in tanks. In other makes of rear turret, the ammunition was stored in the fuselage and fed via the bottom of the turret.

In front of the turret was another knob which could be used to rotate the turret, known as the search lever. It was used when searching for fighters, as this was less tiring than stretching up all the time operating both the guns and the turret. The turret could also be operated by hand if motors or hydraulics failed".

A key part of the Rose turret mechanism was the valve chest. This facilitated a rapid change in the direction that the guns pointed by instantly altering the flow of oil in the hydraulic system. The turret and guns were lined up instantly wherever the sights were pointed. The gun turrets were tested at the Rose factory and some of the men who worked on these guns also installed them in the aircraft.

The rear gunner kept his lonely watch, suspended in space at the extreme end of the fuselage, far removed



from his fellow crewmembers and the Lancaster's rudimentary heating system, in a cramped metal and Perspex cupola that had so little leg space that some had to place their flying boots into the turret before climbing in themselves, whilst subject to the most violent movements of the aircraft. As pointed out earlier, rear gunners often removed a section of the Plexiglas to improve their view, so with temperatures at 20,000 feet reaching minus 40 degrees, frostbite was a regular occurrence. Discouragingly, throughout the sortie, the rear gunner knew that the Luftwaffe fighter pilots preferred to attack from behind and beneath the bomber, so he would be first in line when danger threatened. During World War II 20,000 air gunners were killed while serving with Bomber Command.

Surprisingly, another frustration suffered by all of the gunners in RAF aircraft was the RAF's instruction not open fire except "in moments of crisis" - in case the flash revealed the plane's location to German night-fighters. In practice, it was perhaps the flame from the Lancaster's engine exhausts that provided the enemy pilots with a clearer aiming point.

The Rose turret was used by Nos. 83, 101, 150 and 170 Squadrons of No. 1 Bomber Group from the middle of 1944 onwards. Frazer-Nash later developed the F.N.82 turret which was also fitted with twin 12.7 mm (0.50 in) Browning machine-guns and equipped the Lancaster Mk VII.

Letter to Alfred Rose from Air Chief Marshal Sir Arthur "Bomber" Harris, dated 19th June 1945. The final part of the letter is particularly telling – "...what is easily the

best turret to date. Furthermore it is the only turret from which gunners can escape, if they have to abandon the aircraft, with any real chance of getting away with it, and we have had several Rose turret occupants back as the sole survivors of crews....".

It is believed that Rose also supplied hand-operated dorsal turret gun mountings for a small number of "special transport" (troop carrying) versions of the Armstrong Whitworth Albemarle medium bomber that were transferred to the Soviet Union in 1943/44.

The book - "Lancaster - The Second World War's Greatest Bomber" by Leo McKinstry, published by John Murray (Publishers) - adds to the Rose Turret story. Such was the urgency to equip the Lancaster with 0.5" gun turrets that the Air Ministry did not feel that they could - "rely solely on the efforts of a small Lincolnshire firm" - and continued to put great pressure on Nash & Thompson (Frazer Nash) to complete development of the FN82 Turret. However, this was itself subject to significant delay leading Air Chief Marshal Harris to keep up the pressure on Alfred Rose's team.

The Rose Turret too suffered from some teething problems as mentioned earlier - "In certain early firing trials, the turret shook violently which Air Chief Marshal Harris confessed to Chief of the Air Staff Sir Charles Portal was due to 'poor workmanship in regard to tolerances in the base ring". Despite all of the pluses claimed by Harris, - "For the Air Staff, the serious drawback of the Rose-Rice Turret was the hand-made method used in its manufacture". "The fact was that they could not be produced quickly enough nor were their parts interchangeable. The Air Ministry warned that 'if mass production of the Rose Turret were to be achieved, it would be necessary for completely new drawings to be produced and the job to be properly tooled up'. This process, it was estimated, could take another nine months".

None of this in any way diminishes Alfred Rose's achievement. In the event, as stated above, only 227 Rose Turrets were ever built but even fewer FN82s were fitted to wartime Lancasters. As a footnote to this saga, it is understood that it was suggested in some quarters that the Lancaster would be better if all the "ineffective" turrets were removed, saving weight and crew members and adding some 50mph to the aircraft's top speed. However, the powers that be considered that such a move would be psychologically detrimental to the rest of the crew.

(Thanks to Leo McKinstry for his kind permission to quote extracts from his book).

Much has been said about the close relationship that was built up between Rose Brothers and many of the Lincolnshire RAF bases. T.H. Phillipson remembered: "We also spent a lot of time entertaining

RAF air crew in Alfred Rose's office and on the works Sports Ground. There was a very long period when we used to entertain 30/36 air crew every Sunday and Alfred Rose, Vic Wilson and I took it in turns to entertain them - food, drink and games. I remember entertaining 36 New Zealanders on one occasion. One of these, Flt. Lieut. Mc Cloud, came to see us after the war and we were shocked to learn that of the 26, only four had survived the war".

It is worthy of note that the Rose Brothers subsidiary - The National Folding Box Company - made a valuable contribution to the war effort during 1939 -1945; almost its entire production went into RAF fighters and bombers. For improving the design of certain instruments, a special award was made to the company by the Patents Department of the Air Ministry.

Coping with Change

John Hunter had become involved with contracts for the Services in the 1937 re-armament period and in WW2 dealt with all of the Ministry of Aircraft contracts - this involvement continuing until his retirement at the end of 1964, during which time he had also taken over responsibility for Admiralty work on the death of J.A. Fitchett in 1957. Alfred Rose's policy of putting the needs of the RAF personnel "who had the dangerous work to do", before the "paperwork", caused John Hunter quite a few problems but he eventually devised a system of getting proper contract cover and pricing that satisfied both parties.

Both he and Alfred Rose were, however, less than impressed with the competence of some of the Government Inspectors with whom they had to deal (see also Westwood Works' experience here). John recounts two incidents: "One inspector came to examine some gears made by the Northern Manufacturing Co. and was told that the gears were ready but the keyways were not yet cut; this work would take a day or two more. He passed the gears as satisfactory and sent us a telegram the next day reading 'Despatch gears at once. Keyways can follow'."

"We were producing Reflector Gunsights for aircraft. These were delicate instruments that had to be tested at a temperature of minus 40 degrees and written instructions to this effect were given to our workshops. However, the inspector in question, upon seeing the written instructions, came to me to complain that the instructions omitted to specify whether the low temperature was Fahrenheit or Centigrade. When I pointed out that it was quite unnecessary to do this (since both were the same at minus 40 degrees), he seemed incredulous and said he would have to check with his headquarters".

CREATING SAXILBY AND A NAVIGATION INSTRUMENT

Augustus Muir also tells the remarkable story of how Alfred Rose responded to an unexpected request from the Air Ministry, the result of which was that, in a new 'dispersed' factory in the village of Saxilby a new navigation instrument, an air position indicator that allowed navigators to read off their positioning degrees and minutes, described as "the most efficient type then in use", was produced.

The Ministry of Aircraft Production had first placed the order for these Air Position Indicators with the National Folding Box Company but the Ministry's demands for ever higher rates of production meant that the Company became desperately short of space, and more importantly, female labour. A pool of female labour was found in Saxilby, the plot of land bought, pre-fabricated buildings were erected and the new factory started production in March 1943.

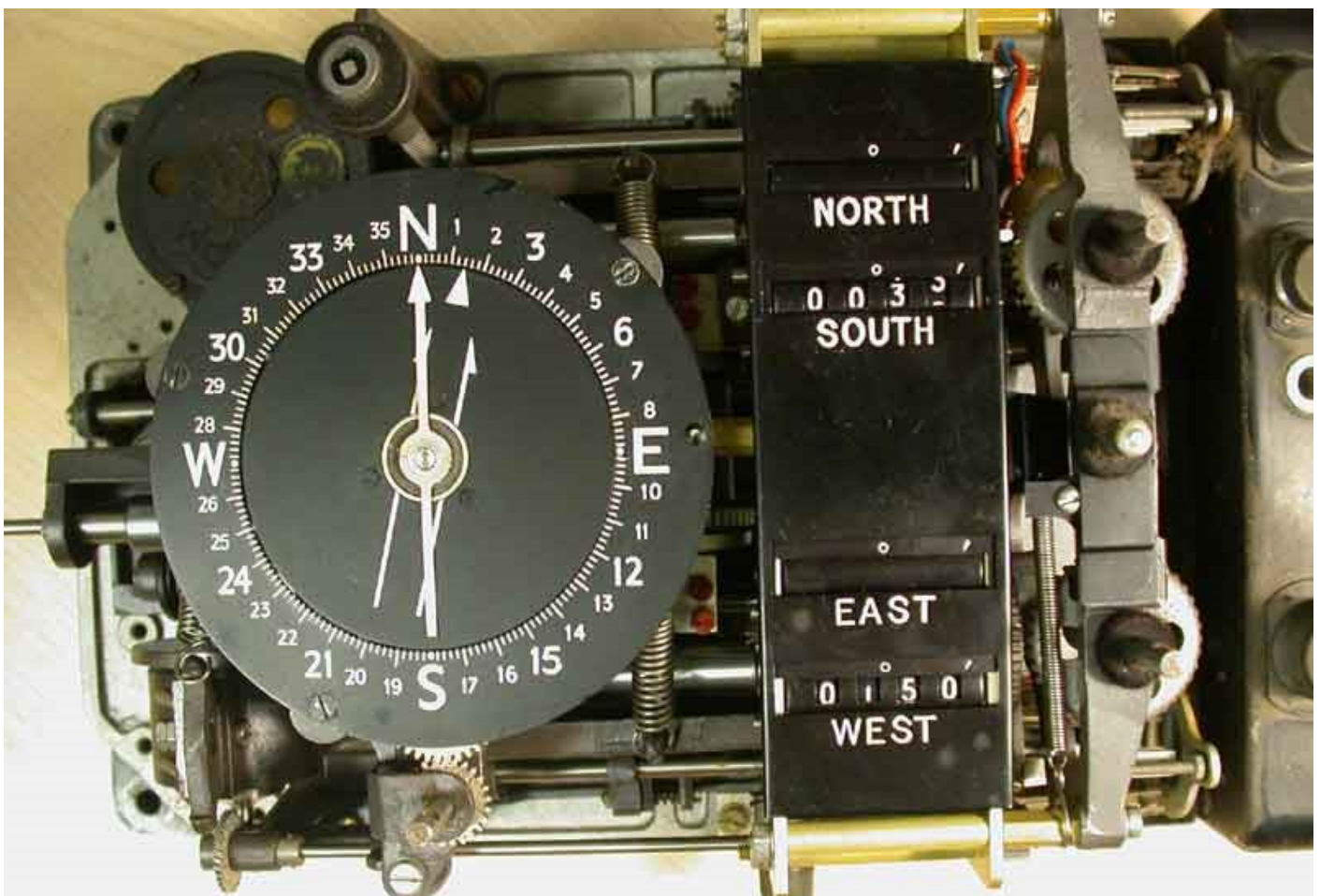
This device continued to be made at Saxilby after the war. Mrs Plummer, who had joined the company at its opening in April 1943, was responsible for the welfare of the well over 100 women who worked in the factory when it was on full production.

This unit computed an aircraft's latitude and longitude

using an entirely mechanical (analogue) process, involving integration, sines and cosines. The current speed and direction were fed in on servo-motors on the right of this photograph. The speed was split mechanically into sine and cosine components for latitude and longitude changes, and integrated to give the current position. The longitude calculation also needed an inverse "cosine" component (longitude changes more quickly nearer the poles proportional to the cosine of the latitude). The mechanical process would, of course, have failed near the north or south poles.

The success of the new instrument brought orders for other pieces of equipment to be made at Saxilby - air-dryers, bomb-carriers, camera mountings, test-units and film processing machines.

<http://www.bphs.net/GroupFacilities/R/RoseBrothersGainsborough/index.htm>



This illustration is believed to be the type of instrument for which Saxilby was first set up to manufacture, and now resides in Bletchley Park. (Image by kind permission of Eric Foxley).



Major C Gordon Burge



Major P B Joubert de la Ferté



Major A A B Thomson



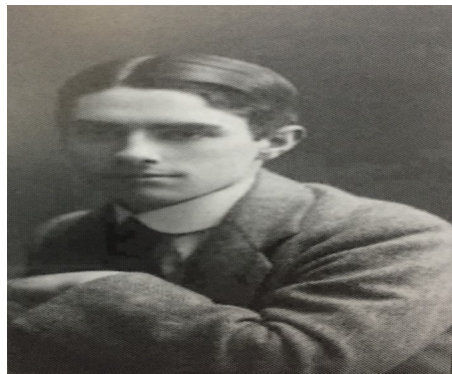
Captain W C K Birch



Captain E N Clifton



Captain C H R Johnston



Captain S W Price



Lieutenant F Egerton



Lieutenant K R G Fenwick



Lieutenant N L Garstin



Lieutenant Holme



Lieutenant H S Marshall - d. Hibaldstow



Lieutenant J W Ross - d. Elsham



Lieutenant A W Rowlands - d. New Holland



Lieutenant J E H Swain



Lieutenant W McLea Walbank



2nd Lieutenant D R Brook



2nd Lieutenant C I Carryer



2nd Lieutenant T H Coupe - d. Scampton



2nd Lieutenant A C Hatfield



2nd Lieutenant P B Prothero



Sergeant F Bradshaw - d. Hibaldstow



Sergeant P Sparkes



Corporal Cyril Butcher

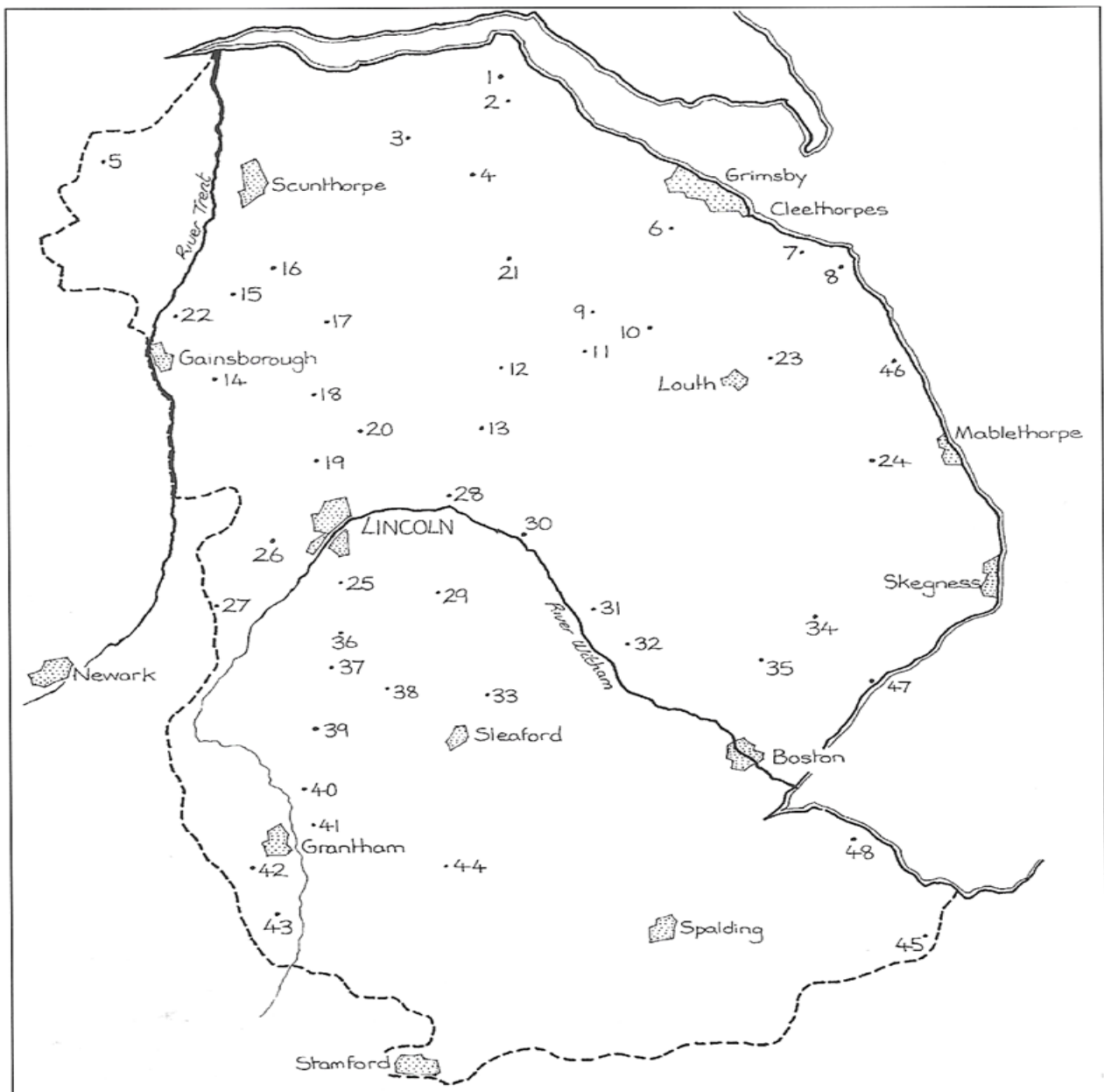


OFFICERS OF ROYAL FLYING CORPS—COLONIALS, CHRIST CHURCH, OXFORD

Gilman

From left to right are: Back row—2nd Lieut. N. Goudie (Canada), 2nd Lieut. W. N. Spragg (N.Z.), 2nd Lieut. D. D. Fowler (S.A.), 2nd Lieut. F. F. Woodyer (Ceylon), 2nd Lieut. S. Nixon (Canada), 2nd Lieut. G. V. Aimer (N.Z.), 2nd Lieut. J. Bell (Aus.); second row: 2nd Lieut. H. Larkin (Aus.), 2nd Lieut. P. A. Wright (Canada), 2nd Lieut. K. L. Caldwell (N.Z.), 2nd Lieut. C. W. Carleton (S.A.), 2nd Lieut. G. A. Bambridge (S.A.), 2nd Lieut. R. F. Talbot (F.M.S.), 2nd Lieut. H. Greenwell (N.Z.), 2nd Lieut. J. A. Cowling (S.A.), 2nd Lieut. L. V. Hirst (S.A.), 2nd Lieut. S. M. Pell (Staff), 2nd Lieut. — Grove (Canada); third row: 2nd Lieut. A. J. Court (Aus.), 2nd Lieut. G. G. Callender (N.Z.), 2nd Lieut. W. Fraser (Aus.), 2nd Lieut. P. W. Suen (Aus.), R. S. Jamieson (S.A.), 2nd Lieut. F. B. Baragar (Canada), 2nd Lieut. A. M. Pearson (Canada), 2nd Lieut. F. D. N. Sams (N.Z.), 2nd Lieut. G. Mackrell (India), 2nd Lieut. S. G. Dowsett (S.A.), 2nd Lieut. F. S. Andrews (S.A.), 2nd Lieut. R. T. Barlow (N.Z.); sitting—2nd Lieut. W. S. Simeon (N.Z.), 2nd Lieut. T. Perkins (Canada), 2nd Lieut. C. F. Reeve (Aus.), 2nd Lieut. H. D. Benningfield (S.A.), 2nd Lieut. G. C. Burnand (Staff), Lieut. C. Court-Treant (adjutant), Major C. Saunders, D.S.O. (commandant), 2nd Lieut. C. F. Anns (Staff), Captain L. A. Dennistoun (Canada), Captain H. S. Lees-Smith (S.A.), 2nd Lieut. J. D. Hewitt (N.Z.), 2nd Lieut. J. D. Hewitt (N.Z.)

LINCOLNSHIRE WORLD WAR II AIRFIELDS



KEY TO MAP

1 Goxhill	13 Wickenby	25 Waddington	37 Wellingore
2 N. Killingholme	14 Sturgate	26 Skellingthorpe	38 Digby
3 Elsham Wolds	15 Kirton Lindsey	27 Swinderby	39 Fulbeck
4 Kirmington	16 Hibaldstow	28 Fiskerton	40 Barkston Heath
5 Sandtoft	17 Hemswell	29 Metherringham	41 Spitalgate
6 Waltham	18 Ingham	30 Bardney	42 Harlaxton
7 North Coates	19 Scampton	31 Woodhall Spa	43 North Witham
8 Donna Nook	20 Dunholme Lodge	32 Coningsby	44 Folkingham
9 Binbrook	21 Caistor	33 Cranwell	45 Sutton Bridge
10 Kelstern	22 Blyton	34 Spilsby	46 Theddlethorpe
11 Ludford Magna	23 Manby	35 East Kirkby	47 Wainfleet
12 Faldingworth	24 Strubby	36 Coleby Grange	48 Holbeach