INTRODUCTION

To-date I’ve written 6 Reference Guides on the British built and designed sporting gliders of what I might term the “wooden” era – Slingsbys, Elliotts of Newbury, Abbott Baynes (Scuds), BAC, the Scott gliders, and the Bill Manuel gliders. These account for at least 98% of all the wooden gliders ever built in Great Britain. There are of course a few smaller manufacturers, especially in the formative days of the British gliding movement in the early 1930s, RFD and Cloudcraft are two of these. Additionally there’s a plethora of “one offs”, principally Primaries, again mostly built in the early 1930s.

I don’t propose to write these up as for the great majority of the remaining 2% we’re talking 80 years ago at least, and there’s no connect at all with the modern day and consequently very little interest unless it’s for the outright gliding aficionado.

However, whilst they’re most definitely not sporting gliders there is one subject I think there is a justification to cover, and that’s the one of British military gliders.

Spawned by the Second World War military gliders held centre stage for only a very few years, the advent of the troop carrying helicopter consigning them to history.

Note all of the British military gliders were named after famous military figures whose name began with an “H”.

As to the sources my main ones have been:

- The gliding magazines made available by the Lakes Gliding Club via their website – http://www.lakesgc.co.uk/ - <Archive><Old Gliding Mags>
- Wikipedia sourced articles
- David Underwood for details of what British gliders are still in existence and where they are

As always if you have new and interesting information and/or photos, else you believe there are mistakes, please contact the author at FGBradney@outlook.com

Glyn Bradney.
THE BEGINNINGS

This has to be the assault on Fort Eben-Emael at dawn on 10th May 1940. Fort Eben-Emael lay on the Dutch/Belgium border near the Dutch city of Maastricht. The fort, which was seen at the time as virtually impregnable, protected via its artillery three key bridges over the Albert Canal, one at least of which needed to be captured intact if the surprise German invasion of the Low Countries was to proceed to plan.

Eben-Emael has the distinction of being the first target for what was an entirely new method of attack in warfare, that of landing the assault force close to the target in troop carrying military gliders. In this first instance the landing wasn’t “close” to the target, it was actually inside it! The gliders used were DFS 230s, 9 of the 11 gliders assigned to the fort landed on effectively what was its roof using arrester parachutes to slow and steepen their approach.

(Courtesy of Wikipedia, article on the DFS 230 glider)

The DFS 230 was designed by the famous Hans Jacobs (The Rhonbussard, Rhonsperber, Habicht, Kranich, Weihe, and Meise are just some of the sporting gliders he also designed) and first flew in 1937, the glider had a 72 feet 1 inch span and could carry up to 9 soldiers. The acronym “DFS” translates in English to “German Research Institute for Sailplane Flight”.

The airborne assault took the defenders of the fort completely by surprise and the majority of the artillery pieces meant to protect the bridges were disabled very quickly. This materially helped the additional glider based attacks on the three key bridges all of which were taken and held despite Belgian counterattacks. However, the defenders had at least managed to
blow up the bridge at Canne, but the remaining two were captured before they could be destroyed. Capture of these two bridges intact allowed the German panzers and mechanised infantry to bypass the other frontier defences and rapidly thrust into the heart of Belgium. The sudden and strategically vital German victory at Eben-Emael undoubtedly was a major factor in the defeat of France, the Maginot Line was simply outflanked. All of this as a consequence of the pioneering use of about 50 DFS 230 troop carrying gliders. The attack on the fort and the three bridges it was protecting was brilliantly planned and brilliantly executed. It ushered in a short but epic era where gliders went into battle.

In London once the facts started to become known the response of the Prime Minister, Winston Churchill was predictably fast. On the 17th June he fired off a memorandum to the War Office ordering very urgent investigation into creating a corps of 5000 parachute troops, and also the possibility of using gliders to transport troops into battle as had happened at Eben-Emael. As a consequence the Central Landing Establishment (CLE) was formed at Ringway airfield, Manchester, a few days later.

This article is focussed principally on the actual gliders, so I won’t go into details of how the formidable airborne forces that landed troops on D-Day, Arnhem, and then the Rhine emerged and developed from the humble, and in the beginning somewhat haphazard, early days of the CLE.

Suffice it to say that several books have been written on the subject, the best from the Great Britain perspective the author sees as Lawrence Wright’s “The Wooden Sword” - ISBN: 9780236177769

Also here’s a link to a terrific article on the early days of CLE and RAF Thame at Haddenham, where training of the pilots for the Glider Pilot Regiment first began.

http://www.haddenhamairfieldhistory.co.uk/gliders.htm

(<Ctrl> + Click to access the above link)

THE GLIDERS

Not too surprisingly once the details of the Eben-Emael operation started to become known the very first Air Ministry glider specification issued in July 1940, X.10/40, was for an aircraft very similar to the German DFS 230. This was for a glider capable of carrying 7 troops in addition to its crew.

As far as I’m aware only two bids were submitted, one by Slingsby of Kirbymoorside, Yorkshire, and the other by General Aircraft Limited (GAL) of Feltham, Middlesex.

It was the bid from GAL that succeeded resulting in the Hotspur. The Slingsby submission was never built following the failure of the factory bid, but for the sake of completeness I’ll include details.
THE SLINGSBY TYPE 17

A span of 70 feet and aspect ratio of 12. The pilot and co-pilot sat in tandem with 6 troops behind them. As already stated following the success of the GAL bid this glider was never built.

THE GAL 48 HOTSPUR (Mk 1)

General Aircraft Limited won the Air Ministry tender for X.10/40. With a span of 61 feet 10 3/4 inches it was similar to the Slingsby T.17 in that it carried 8 personnel including the pilot and co-pilot (who sat in tandem). The prototype first flew on the 5th November 1940 according to the Wikipedia article on Hotspurs. Note the first Hotspur arrived at RAF Thame on the 3rd April and first flew there on the 9th April.
The Hotspur I wasn’t an ideal training glider as it had been designed and built as an assault glider to be released at 20,000 feet and then glide up to a 100 miles to its target landing area. Under a cloud street it could, and indeed on occasions at Haddenham was, soared during a training flight.

(Hotspur Mk 1 on final approach, note the long wingspan)

Only 18 Mk 1’s were built, 10 by General Aircraft Limited and 8 by Slingsbys.

HOTSPUR Mk 2

(Hotspur Mk 2, wingspan was 16 feet shorter compared to that of the Mk 1)

The lessons learnt on the Mk 1 resulted in the Mk 2. Whilst of the same length the fuselage was strengthened, exit/entry doors fitted, and a braking parachute added. The major change
was shortening the span to 45 feet 10 ¾ inches, which meant “no more soaring”!

One of the problems with the Hotspur Mk 2 was its very long landing run which was exacerbated if it was a “no wind” day, this especially so if the glider was fully loaded. This became a big problem with the training being carried out at RAF Thame which was only a small airfield. After a number of near things the inevitable happened with a very bad overshoot, amazingly no one on board was badly hurt.

(The Haddenham Hotspur Mk 2 crash, what you don’t see ended up on the railway below!)

As a consequence of this what was now named Number 1 Glider Training School moved to RAF Croughton, Northamptonshire, on the 1st August 1942.

50 Mk 2 Hotspurs were modified to become Mk 3s, better equipped for training. The key modifications being fitting dual controls, better instrumentation, and a strut braced tailplane.

Overall 1015 Hotspurs were built. 18 Mk 1s, 946 Mk 2s plus 50 Mk 3s (conversions from Mk 2s) all by the Harris Lebus company, and a single prototype GAL 48B “Twin Hotspur” which I will describe shortly. For a glider that’s always associated with General Aircraft Limited it’s surprising that out of the total of 1015 the GAL factory only built 11.

No Hotspur ever flew operationally. Their use was in fact considered during the planning stage of Operation Overlord, this for delivering cargo/equipment into Normandy, but the plan never went ahead. So the usage of the Hotspur glider during WWII was solely for initial training on troop carrying gliders.
The Hotspur was a “knee-jerk” reaction to the German DFS 230. After consideration it was appreciated that a single military glider really needed to carry more personnel into battle than the maximum of 8 that the Hotspur could carry. A single powered aircraft towing 2 Hotspurs was considered, but was dropped when the extreme difficulty of towing at night or through cloud was taken into account. Accordingly the Air Ministry issued specification X.25/40 for a glider capable of carrying 14 troops + pilot, and then (on the 12th October 1940) X.26/40 for a glider to carry between 24 and 36 fully armed troops.
A curiosity I think most would agree, the Twin Hotspur was possibly GAL’s submission to X.25/40 which was in fact won by Slingsby’s Type 18 Hengist. The Twin Hotspur was two Hotspur Mk 2 fuselages joined together by a short centre section. The overall span was 57 feet 11 inches, the glider being flown from the port cockpit as its starboard counterpart had no controls. It was designed to carry 15 troops in addition to the pilot. Only one prototype was built, this by the GAL factory, the first flight taking place in August 1942 towed by an Armstrong Whitworth Whitley.

SLINGSBY TYPE 18 HENGIST

The X.25/40 contract was won by Slingsbys with their Hengist. It was partly a back-up in case problems occurred with the Airspeed Horsa which had won the X.26/40 contract. The principal initial worry with the larger Horsa was having a sufficient number of aircraft capable of towing it when fully loaded.

The Hengist first flew at Dishforth in January 1942 towed by a Whitley bomber. The span was a considerable 80 feet and it was designed to carry 15 people inclusive of the pilot. The original concept of the Hengist appears to have been to carry parachutists, such that after they had jumped over the target landing area the glider would be towed back to base to pick up the next load. Not surprisingly the advent of the American C47 Dakota put paid to this
strange idea. Strange because a key justification for using a glider to transport troops is that they would all be together on landing, rather than parachutists being dispersed to a lesser or greater degree dependent on dropping conditions.

(Courtesy of Wikipedia {Public Domain}, Hengist on tow at the Airborne Forces Experimental Establishment (AFFE), Sherburn-in-Elmet, 25th April 1943)

The second prototype was written off at Dishforth and as a consequence of this a Mk 3 was produced with a strengthened undercarriage. Overall Slingsbys built 18 Hengists but they never saw any operational service. Two were used by the Glider Pilots Exercise Unit and a small number by AFFE, the majority were kept in storage until after the end of the war when they were all scrapped.

**AIRSPEED AS 51 HORDSA**
Unquestionably the most famous of the British built military gliders, it was the winner of the Air Ministry X.26/40 specification. Having an 88 feet span it carried up to 25 troops plus the 2 crew. The first flight took place on the 12th September 1941 towed by a Whitley at what is now Heathrow airport.

5 prototypes were built, the first two by Fairey Aircraft which were used for flight testing, and the remaining 3 at the Airspeed Portsmouth factory which were for loading tests. A production order from the Air Ministry for an initial 400 Horsas was received in February 1941.

The overall number of Horsas built is not known. It’s certainly a minimum of 3800 and some sources say as many as 5000. Just under 700 were built by Airspeed at their Christchurch factory, the others by a number of contractors, mostly furniture manufacturers, who built the components – the Horsa was almost completely built of wood, and was made up of 30 separate components. Factories such as Harris Lebus and Elliotts of Newbury made their specific components which were then transported to RAF Maintenance Units for final assembly. Austin Motors was another major manufacturer of Horsa components.

Instead of troops the Horsa I could carry a jeep or a 6 pounder gun.
The Horsa II (AS 58) had a hinged nose to allow the direct loading and unloading of equipment. The floor was also strengthened so as to be able to take the load of heavier vehicles. Finally the towing cable was attached to the nose wheel strut rather than the twin wing connections used with the Horsa I.

OPERATIONAL USE OF THE HORSA

• First use the night of the 19/20th November 1942 when 2 Horsas towed by Halifaxes attacked the German heavy water plant at Rjukan in Norway, this was Operation Freshman. The operation failed due to bad weather, both Horsas and one of the Halifaxes crashed. None of the personnel in the gliders survived, those who weren’t killed in the crashes were executed on the direct orders of Hitler. This sadly included Sergeant Malcolm Strathdee the first Army glider pilot to go solo at RAF Thame.

• Operation Husky, 19 Horsas were used in the invasion of Sicily on 10th July 1943. Husky included 2 separate glider landings as part of its overall plan. Operation Ladbrooke to capture the Ponte Grande Bridge near the town of Syracuse, and Operation Fustian to capture the Primosole Bridge. Ladbrooke used 8 Horsas (and 136 Waco CG-4As), Fustian 11 Horsas (and 8 Wacos). Both operations have to be seen as unquestioned failures from the glider perspective, though much was learnt from the subsequent post mortems which was applied in following glider operations.

• D-Day invasion on the 6th June 1944. A mass of Horsa landings but the most spectacular was Operation Deadstick where the objective was to capture the bridges over the Caen canal (later named the Pegasus Bridge after the airborne forces who captured it) and the river Orne. The capture of these two bridges intact
was vital else the 6th Airborne Division could have been cut off. 6 Horsas were used taking off from Tarrant Rushton towed by Halifaxes, the objectives were duly captured before the Germans could destroy them, it was subsequently described as "one of the most outstanding flying achievements of the war".

(Caen canal bridge, 9th June 1944, Horsa gliders in the background. Courtesy of Imperial War Museum {Non Commercial Licence})

- Operation Deadstick has been described as the “coup de main” of Operation Tonga which was the airborne assault of the British 6th Airborne Division being a key part of Operation Overlord and the Normandy landings on the 6th June. The Operation Tonga objective was to secure the area around the city of Caen and create a bridgehead until it could be linked up with the advancing ground forces from the invasion beaches. Additionally to destroy the coastal gun battery sited at Merville which threatened Sword Beach where the seaborne British troops were to land. There were 4 phases to the glider landings on D-Day. a.) 1st phase of 6 Horsas
(Operation Deadstick) landing just after midnight b.) 2\textsuperscript{nd} phase 17 Horsas landing approx. 01:00 c.) 3\textsuperscript{rd} phase 71 Horsas (and 4 Hamilcars) landing 03:00 – 04:30 d.) 4\textsuperscript{th} phase (\textbf{Operation Mallard}) 226 Horsas (and 30 Hamilcars) landing 21:00.

- Phases 1,2,3 used Halifaxes, Albemarles, and C-47 Dakotas as tugs were launched from Tarrant Rushton, Harwell, Down Ampney, Blakehill Farm, and Brize Norton airfields. Phase 4 used the same towing aircraft plus Stirlings, airfields used were the same as Phases 1-3 apart from Blakehill Farm, with Broadwell, Fairford, and Keevil also taking part.

- Despite experiencing bad towing weather during the initial stages Operation Tonga was a major success and by the end of D-Day the 6\textsuperscript{th} Airborne Division had achieved all of its objectives. As example in Operation Mallard 246 of the 256 gliders that took off from England reached their designated Landing Zones.

(Courtesy of Wikipedia {Public Domain}, Horsas on Landing Zone “N”, Operation Mallard)
• **Operation Dragoon.** The invasion of the South of France, Cote d’Azur, by Allied airborne and ground forces on the 15th August 1944. The great majority of the gliders involved in Operation Dragoon were Waco CG-4As, 450 of them flown by US pilots. However, there were also 36 Horsas piloted by members of the Glider Pilot Regiment. The reason for the Horsas is that they could carry both a jeep and a gun whilst it took 2 of the smaller Wacos to do this. The Horsas took off from Tarquina airfield to the north-west of Rome, but were recalled over Corsica because of mist blanketing the Landing Zones, the Wacos continued. This caused confusion as some of the troops thought they were in France when they landed back at Tarquina. The quick and dirty way to get your jeep and gun out of a Horsa was to just drive it out through the tail thereby destroying the glider. A number were only just stopped in time from doing this. The gliders and their tugs were rapidly re-marshalled at Tarquina and took off again at 14:30. This time there was no recall and the gliders reached their Landing Zones at 17:45 landing without enemy opposition. Operation Dragoon was a success, it caused the German Army Group G to abandon Southern France and retreat to the Vosges mountains.

• **Operation Market Garden.** The 1st Airborne Division landings at Arnhem which began on the 17th September 1944. The plan primarily devised by Field Marshal Montgomery was to by-pass the northern end of the German defensive Siegfried Line and force an entry into Germany over the Lower Rhine. The expectation was that if the operation was successful the European war would be over by Xmas of 1944. The key objective was to capture a number of bridges intact, the most important of which were at Arnhem, which would then allow a rapid advance into Northern Germany by armoured units. “Market” was the airborne assault using paratrooper drops and gliders, “Garden” was the land attack by the forces who had already taken Brussels and Antwerp.

  336 Horsas were used in the initial assault on Sunday 17th September (plus 13 Hamilcars and 10 Hadrians). 276 of the glider force managed to land on the 3 Landing Zones with another 34 very close, so purely from the glider perspective a considerable success. 18th September saw a second airlift of reinforcements. These were 279 Horsas and 15 Hamilcars tasked to land on the Arnhem “X” and “S” Landing Zones, 256 either landed in the Zones themselves else in close proximity. The third and final airlift of gliders went ahead on the 19th September, 43 Horsas and 1 Hamilcar with their objectives Landing Zones “L” and “S”. 31 Horsas managed to land in the Landing Zones but their personnel took very heavy casualties as they landed in the middle of a battle.

  Market Garden ended as a failure. There were two key reasons for this. Firstly the presence in the Arnhem area of 2 battle hardened Panzer divisions who were refitting. Dutch Intelligence did report this to the British but it was not believed. Secondly also in the Arnhem area was Field Marshal Model, one of the most capable officers in the German Army High Command. He actually witnessed the initial assault on the 17th being at the time only 3 miles away from the Landing Zones, and immediately ordered the Panzer divisions into action. Thus the British troops were fighting against well-equipped and numerically superior forces from the very start of the operation, which had not been expected. The key bridge, a single span steel one, over the Lower Rhine River that had to be captured was actually in Arnhem itself.
There was also a nearby railway bridge but the Germans blew this up. The 1st Airborne Division captured the southern end of the bridge but despite many attempts could not successfully cross and take the northern side. After several days of very fierce fighting Montgomery accepted the bridge could not be taken with his by now heavily depleted forces and that they would have to be withdrawn if any were to be saved. This withdrawal began on the 25th September. Market Garden came at a huge cost to the Glider Pilot Regiment. 229 of their pilots were killed and another 469 taken prisoner, a shattering blow that took a good while to recover from. Arnhem was far and away the largest airborne operation up to that time. 14,589 troops were landed by glider (20,011 by parachute), the gliders also bringing in 1736 vehicles and 263 artillery pieces.

(Courtesy of Wikipedia {Public Domain}, Horsas landed at Arnhem, note the jettisonable tail units, also the swung back noses, these were Mk 2 Horsas. Taken from a RAF photo reconnaissance Spitfire)

- **Operation Varsity.** The crossing of the Rhine on the 24th March 1945, the largest single lift airborne operation in history. This was a combined American/British operation which was planned to transport and land 21,680 troops by parachute and glider in just one lift. The objectives were to capture the Diersfordter Forest which stood on high ground overlooking the town of Wesel, and to secure the bridges over the River Isel to the north of Wesel. This would then enable the main Allied ground forces to thrust into the heartland of Germany. The British component of Varsity was the 6th Airborne Division which had already played a major part in Operation Overlord, the invasion of Normandy on D-Day.
The Glider Pilot Regiment had suffered huge casualties at Arnhem and it was necessary to bring in and train many RAF pilots to bring the Regiment to the required number of pilots needed for Operation Varsity. This included a short course in combat training, in the event the RAF contingent were to acquit themselves very well in the ground fighting. 392 Mk 2 Horsas were used in Varsity being launched from 8 English airfields – Birch, Earls Colne, Gosfield, Great Dunmow, Matching, Rivenhall, Shepherds Grove, and Woodbridge – this in addition to 48 Hamilcars. Note the majority of the glider force used in Operation Varsity were the American Waco CG-4As, over 900 of them. The operation, which was the last military glider one in WWII, was a complete success with all objectives being achieved on that first day.

**GAL 49 HAMILCAR I**

A very large transport glider, span 110 feet, designed to carry either 60 troops or a seven ton light tank (either a Tetrach or M22 Locust). This was to meet Air Ministry specification X.27/40 which was granted (rather than won!) to the General Aircraft Limited company which was already responsible for the Hotspur. As for such a large glider it was somewhat of a step into the unknown for GAL, they built a half-sized prototype, the GAL 50. This was first flown in September 1941 from RAF Snaith. However, it was just a single flight as the pilot approached too low on landing and committed the cardinal sin of trying to stretch the glide by raising the flaps. The result was a crash that wrote off the glider.

(Plan drawings of the GAL 49 Hamilcar, “British Gliders and Sailplanes 1922 – 1970”)

The first flight of the full sized prototype was on the 27th March 1942, again from Snaith, towed by a Halifax bomber. A second prototype was built and this carried out extensive testing including at RAF Beaulieu with the Airborne Forces Experimental Establishment. The trials must have been deemed successful as there was very little difference between the prototypes and the production machines. However, building and delivering the production
gliders was plagued with problems. The first 40-50 were meant to be completed by the end of 1941 but this was not in fact achieved until early 1944. There were a number of reasons for this a.) Vacillation by the Ministry of Aircraft Production b.) Scarcity due to high demand elsewhere for the raw materials needed to build the glider c.) Very poor management and organisation at GAL itself d.) Not having the personnel to construct the Hamilcar from the various components it was comprised of, plus not enough airfields to store them. Come D-Day in June 1944 a total of just 80 Hamilcars were complete and ready for airborne operations. Production finally ended in 1946 when a total of 344 Hamilcars had been built.

(Courtesy Wikipedia {Public Domain}, M22 Locust tank leaving a Hamilcar)

The Hamilcar was very versatile as to the load it could carry. Some of the alternative loads to a light tank were a 17 pounder anti-tank gun with towing vehicle, a 25 pound howitzer with towing vehicle, 2 universal carriers, bulldozers, etc. If it had a disadvantage it was the size which made it very vulnerable to anti-aircraft fire especially on final approach, also losing/breaking the towline to the towing aircraft which was almost always a Halifax bomber.

OPERATIONAL USE OF THE HAMILCAR

Just 3 operations:

- **Operation Tonga** (Invasion of Normandy, June 1944). 4 Hamilcars were part of phase 3 and took off from Tarrant Rushton at 02:10 on the 6th June each carrying a 17 pounder anti-tank gun, its towing vehicle, and its crew. Only two landed successfully on the designated landing zone “N”. Phase 4 saw 30 Hamilcars taking off from Tarrant between 18:40 and 19:35 for Landing Zone “N”. All 30 managed to make the Landing Zone though there were several collisions on landing. Payload
varied, 20 carried Tetrach light tanks, several others carried universal carriers and one 16 motorcycles and a jeep. Note some of the Horsa gliders participating in Tonga were eventually returned to England. However, this didn’t include any of the Hamilcars, they were seen as just too large to recover at the time.

(Awaiting take-off from Tarrant Rushton on the 6th June. Behind the 2 Horsas at the front are the 30 Hamilcars of the phase 4 part of Operation Tonga)

(Courtesy Wikipedia {Public Domain}, Hamilcar landing)
Operation Market Garden. (Arnhem landings, September 1944) Following the losses of Operation Tonga Hamilcar strength had been built up to 64 by the start of September 1944. The original plan was to use 38 of these via 3 separate lifts. The first lift was on the 17th Sept using 13 Hamilcars, 8 carrying 17 pounder anti-tank guns and the other 5 two universal carriers each. All 13 gliders reached Landing Zone “Z”, 10 of them landing safely, the other 3 crashing. The second lift on the 18th Sept used 15 Hamilcars, 8 with anti-tank guns, 4 with universal carriers, and 3 packed with ammunition and stores. 11 landed successfully on Landing Zone “X”. The third lift on the 19th Sept was cancelled due to bad weather and doubts whether the intended Landing Zone could be used because of German counter attacks. The intention had been for 10 Hamilcars to carry American engineers, bulldozers and cranes to Landing Zone “W”, the objective to construct a forward airfield once the gliders had been cleared away. The weather finally cleared on the 21st but the operation was abandoned as it was clear by then that the Market Garden operation had run into major problems. One operational flight by a single Hamilcar did take place on the 21st, this to accompany the 1st Polish Independent Parachute Brigade on its drop near the town of Driel. However, the Hamilcar didn’t make its LZ as the tow rope snapped over Belgium forcing the glider to land near Ghent.
The ground battle being quickly won enabled some of the undamaged Hamilcars to be dismantled and shipped back to England where they were then used in the construction of further gliders, though none of these ever saw operational service.

Unlike the Horsa the Hamilcar did remain in service after the end of WWII. At the end of 1945 64 were recorded as being present at the main Hamilcar base, Tarrant Rushton. 44 of these were disposed of as surplus in January 1946. The remaining 20 continued to be used for exercises and in transporting large/heavy loads until a further 6 were disposed of in July. By February 1947 just 12 were left which by then
were principally used in airshows and public displays. Exactly when the last Hamilcar was scrapped we don’t know, likely sometime in the mid-1950s. A crying shame that none were ever preserved for posterity.

(Courtesy Wikipedia {Public Domain}, Operation Varsity, a “universal carrier” just after unloading. Note the Horsa in the far distance beneath the Hamilcar's port wing)

- Surprising, but only 111 of the 344 Hamilcars that are recorded as being built ever took off on an operational mission.

GAL 58 HAMILCAR X

The prototype was a conversion from a Hamilcar Mk1 to meet Air Ministry specification X.4/44. Two 965 hp Bristol Mercury engines were added which necessitated both the wings and the fuselage being strengthened to take the additional weight. The glider was intended for airborne operations in the Far East against the Japanese where temperatures were invariably very high, and also with many airfields situated at high altitude sites. All of this had a dramatic effect on a Halifax launching a Hamilcar unless the towing aircraft had a low fuel load, which in itself was very much counterproductive for operational purposes. The idea of the Hamilcar X was that under power it could assist in the initial launch and also extend the overall range. The first flight took place in February 1945 when the glider took off under its own power. However, testing showed a fully loaded Hamilcar X could not maintain height on its own, even under full power, which meant the maximum load that could be carried had to be reduced. Two further Hamilcar Mk1s were converted, and when the trials were completed satisfactorily a further 8. Finally 10 Hamilcar Xs were built as new. So 21 produced overall
though none ever flew operationally.

(Courtesy Wikipedia {Public Domain}, Hamilcar X)

**WACO CG-4A (NOT a British designed/built glider!)**

However, I think I need to include some details of this glider as it played a key role in the military glider operations of WWII, and it was flown on a number of European operations by members of the Glider Pilot Regiment. “Waco” translates as the Weaver Aircraft Company of Ohio”, though the name changed to the “Waco Aircraft Company” in either 1928 or 1929.

(Plan View of Waco CG-4A)
A wood and metal glider with a crew of 2 that could carry 13 troops and their equipment else a jeep or a 75 mm howitzer. With a span of 83 feet 8 inches the Waco was smaller than the British Horsa and its maximum payload was appreciably less. However, it had the advantage of being able to land in a much smaller area than the Horsa. The upward hinged nose allowed easy entry/exit for the payload and the wheels were detachable in flight if desired so the glider could land on its skid with a shorter landing run. The first flight took place in May 1942 and a little over 13,900 (14,972 of all Mks) Waco CG-4As were built in 16 factories across the United States. The Ford Motor Company at Kingsford, Michigan, built the most with 4190, the designers the Waco Aircraft Company at Troy, Ohio, 1074.

OPERATIONAL USE OF THE WACO

- The first was in Operation Husky the invasion of Sicily, July 1943, where 144 Wacos were towed 450 miles across the Mediterranean by C47 Dakotas. This turned out to be somewhat of a disaster as over 60 were cut loose by the towing aircraft when they were far too far from land with the result they inevitably landed in the sea, over 250 of the personnel being carried were drowned.

- Operation Overlord, the invasion of Normandy, June 1944. 621 Wacos flown by American crews transported troops of the 82nd and 101st US Airborne Divisions on the 6th June to Landing Zones in the Cotentin Peninsula, a main objective being to block approaches to the Utah landing beach. Note the Americans also used some Horsas as they had been given 301 of them by the British.
• **Operation Dingson.** The plan was to land 11 “Hadrians” behind enemy lines near Lorient carrying French SAS troops and jeeps. The operation went ahead on the 5th August 1944, 11 Hadrians were towed by Halifaxes from Tarrant Rushton, though one had to return to Tarrant soon after launch. The remaining 10 all landed safely on or nearby their designated Landing Zone. Dingson was viewed as a definite success. Note the Hadrian was the name given to the CG-4A when used by the Glider Pilot Regiment/RAF. I’ve not found a report so far on the exact number but it’s believed that over a 1000 CG-4As were procured by Britain from the United States.

(Courtesy Wikipedia {Public Domain}, British “Hadrian”)

• **Operation Dragoon,** the Allied invasion of Southern France. 450 Wacos launched on the 15th August 1944. When the Wacos arrived over their Landing Zones they found them blanketed in mist which forced the towing aircraft and glider combinations to orbit for an hour before the sun burnt off the mist. The great majority of the Wacos then landed safely, opposition was light, and the objectives of Dragoon were rapidly accomplished.

• **Operation Market Garden,** the failed attempt to outflank the German defensive Siegfried Line by capturing a number of bridges across the Lower Rhine at or near Arnhem. After the Normandy landings the Allied glider forces had been rebuilt such that on the 16th September there were available 2164 Wacos, 916 Horsas (812 British, 104 US Army), and 64 Hamilcars. However, the Americans only had 2060 trained glider pilots available which meant the Wacos had to fly without a co-pilot though this allowed an extra soldier to be carried. The towing force available was 1438 C47 Dakotas (1274 USAAF and 164 RAF) plus 321 converted RAF Bombers (Albemarles, Halifaxes, and Stirlings). This meant the glider force could not be launched in a single lift. 3 separate lifts were used on the 17th/18th/19th September where a total of 1900 Wacos were launched from English airfields, this included 10 British Hadrians on the 1st lift. The American glider borne troops achieved their objectives but overall Market Garden was only a partial success as the British 1st Airborne Division met very strong German resistance and failed to capture the key
bridge in Arnhem itself. The 1977 film directed by Richard Attenborough telling the story of Market Garden was aptly named “A Bridge Too Far”.

On Boxing Day, December 1944, 61 Wacos delivered medical teams, artillery, ammunition, and much needed fuel to the beleaguered 101st Airborne Division who were surrounded at Bastogne in the Ardennes (The so called “Battle of the Bulge”). The landings took place under very heavy enemy ground fire, all of the Wacos ending up being destroyed, though the great majority of the desperately needed supplies were retrieved.

Operation Varsity, the crossing of the Rhine on the 24th March 1945. 906 Wacos were used to carry troops of the 17th US Airborne Division and the 6th British Airborne Division in what was the last large-scale use of gliders during World War 2. Varsity was an undoubted success though both the gliders and their towing aircraft suffered heavy losses, despite this all of the objectives were rapidly achieved. Less than 2 months later Germany unconditionally surrendered on the 7th May and so the European conflict ended.
Wacos were used by British forces in the Far Eastern conflict against Japan. A notable occasion was in support of Operation Thursday in March 1944 where 9000 “Chindits” and 1000 mules were delivered by 680 Wacos over a one week period 150 miles behind the Japanese lines in Burma. Mules were absolutely essential for carrying supplies in the jungle war, a single animal could carry up to 200 lbs. A Waco could carry 3 mules and their handlers, the mules being harnessed in makeshift bamboo stalls.

After the war the majority of the remaining Wacos in the United Staes were declared surplus and sold. Many were sold for their wood, still in the packing cases in which they would have been shipped to their designated war zone. Some of the fuselages were used as towed camping homes, hunting lodges, or lakeside cabins.

The last known use of Wacos was in the 1950s when the USAF used a number to deliver personnel and supplies to Arctic scientific research sites. The landing gear of the normal Waco was replaced by skis and they landed on ice floes. They were also retrieved from the ice floes using a “snatch” technique that the Americans had developed during the Pacific war.

It’s good that a number have survived and are now on display in museums, some just the cockpits but also some the complete aircraft. The Wikipedia article on the Waco CG-4A lists 18 museums, one of these being the Museum of Army Flying at Middle Wallop in Hampshire.

http://www.armyflying.com/
LITTLE KNOWN BRITISH MILITARY GLIDERS

THE BAYNES BAT

A “one-off” built by Slingsby in 1943 that was never given a Slingsby Type number, no doubt because it was designed by L.E. Baynes – who was also responsible for the Scud series of gliders built in the 1930s.

(Wikipedia – public domain)

This was an experimental tailless glider meant to help testing a rather astonishing concept! Namely that wings would be fitted to a tank which would be towed to a battleground destination where the pilot released the tow and glided down to land. After quickly discarding the wings the tank would then roar off into battle with its crew including the pilot! Phew! The Bat with a 33 1/3rd feet span was built to be a 1/3rd scale of that of the intended production aircraft. The first flight took place in July 1943 at the Airborne Forces Experimental Establishment at RAF Sherburn-in-Elmet. A number of other successful test flights were made, most of them by the very famous pre-war glider pilot, Robert Kronfeld, then a RAF flight lieutenant. The full scale version of the Baynes Bat never did get built, the concept got discarded with the appearance of the General Aircraft Limited Hamilcar which could carry a 7 ton light tank internally. The Bat went on to be intensively used by the Royal Aircraft Establishment for testing the flying characteristics of tailless aircraft. Wikipedia records its last known location as being in a hangar at Croydon airport in 1958. One has to wonder how it got there, and indeed what was its eventual fate – Croydon airport was shut down completely in September 1959.

THE GAL 55

General Aircraft Limited won the Air Ministry Specification TX.3/43 to build an initial training glider that would be used before the pilots moved onto the Hotspur, and then the Horsa. The side-by-side seating glider, 35 feet 1 ½ inches span, had a tricycle landing gear and both dives brakes and split trailing edge flaps. It first flew at Hanworth in late 1943 behind a
Westland Lysander.

(Plan drawings of the GAL 55, “British Gliders and Sailplanes 1922 – 1970”)

(The GAL 55 {Public Domain})

Two GAL 55s were built and flew. However, testing showed that their handling characteristics differed markedly to those of the Hotspur and Horsa. For this reason the glider was never but into production.

**THE AIRSPEED AS 54**

This was Airspeed's submission to the TX.3/43 Air Ministry Specification for a training glider. There were some similarities to the GAL 55 which won the tender, namely both dive brakes and trailing edge flaps. The AS 54, however, had two jettison-able main wheels and a central skid – it also could carry water ballast in the fuselage. The span was 36 feet.

It's not believed any example of this glider was ever completed.
ARE THERE ANY ORIGINAL BRITISH MILITARY GLIDERS STILL EXISTING?

I'm afraid very little original still existing, which contrasts sadly with the American Waco situation. To a huge extent for any military glider that went on an operational flight it was a “one-way” trip, though a few did get recovered from their Landing Zones. One would have hoped that at the end of the war the historical importance of these gliders would have been recognised. However, in post-war Great Britain it was a time of considerable austerity and it’s not too surprising that the preservation of war time artefacts did not receive any priority let alone recognition at that time. Also of course the gliders were primarily made of wood which unless looked after will deteriorate, especially if exposed to the elements! – nothing like the case with metal, eg aircraft, armoured vehicles, and ships!

(Horsa on display at the Pegasus Bridge Museum in France)
So we have Horsa Mk 2 (KJ351) on display at the Museum of Army Flying, Middle Wallop, Hampshire, made up from a number of components from different Horsas. There is also the "replica" Horsa (see above picture) at the Pegasus Bridge Museum, Benouville, France, where the forward fuselage is believed to be from an original Horsa having been retrieved from Cholsey, Oxfordshire, where it had been used as a dwelling for over 50 years!

Below the update from David Underwood which I’ve copied in as received:

I thought I would update you on surviving military gliders. Although no complete glider survives there are some large sections around.

**Airspeed Horsa**

1 cockpit and 2 fuselage sections at Museum of Army flying, Middle Wallop.

1 cockpit and fuselage section at De Havilland Museum London, Colney.

Cockpit section Imperial War Museum, Duxford.

(I have a perspex round window and small bit of metal of one)

**GAL Hotspur**

Cockpit section in store. Imperial War Museum, Duxford.

Rear fuselage used in the replica Hotspur Museum of Army flying, Middle Wallop.

(I also have a set of wheels for a Hotspur and pilots notes)

**GAL Hamilcar**

Forward fuselage Tank Museum, Bovington Dorset

Forward fuselage Museum of Army flying, Middle Wallop.

(I have a small metal fitting of one)

**No Hengist** but I have the Air Publication on it.

**Waco CG4**

Fuselage, wing, tail assembly Museum of Army flying, Middle Wallop.

Fuselage frame. Yorkshire Air Museum, Elvington.

(I have a small metal fitting from Holland of one)

The Airborne Assault trust have a replica Horsa and Waco CG4 Stored at Cosford.