

## TRANSCRIPT

**Matt Norman:** “Truly it was a great deliverance.”

That’s one of the final lines from a 1941 Ministry of Information pamphlet detailing the air campaign known as the Battle of Britain.

**Katie Fox:** This pamphlet, housed in our library, is titled “The Battle of Britain: An Air Ministry Account of the Great Days from 8th August - 31 October 1940.” The publication was a success, and within the year, the Ministry redid it. In the updated 35 page edition, they used the latest in graphic design techniques, so it’s quite a striking document full of infographics, diagrams, and photographs that bring the battle to life.

A single image stretches across the front and back cover: nine dashing pilots in uniforms and bomber jackets standing in front of a Hurricane. Ruddy faced, with the wind blowing against them, they seem ready for anything.

**Matt:** On the back of the pamphlet is the iconic Churchill quote that’s so often used in our remembrance of the Battle of Britain:

“Never in the field of human conflict was so much owed by so many to so few.”

**Katie:** It’s also been said that the few were supported by the many, and in this special episode, we’re going to share some lesser-known stories of the many: the ground crew who kept the RAF fighter planes operational, the members of the Women’s Auxiliary Air Force who made sure lines of communication stayed open under fire, the Black and Asian pilots who were recruited during the Battle to bolster the RAF’s flying force, and the engineers dedicated to keeping RAF planes airworthy during the battle and today.

**Matt:** You’re listening to On the Record at The National Archives, a show that uncovers the stories hidden in our collections, stories of famous monarchs and spies...and stories of everyday people like you and me.

I’m Matt Norman

**Katie:** And I’m Katie Fox.

Here at The National Archives, we're the guardians of more than 11 million historical government and public records spanning a thousand years of British history.

We're the paper trail of a nation, and our original documents have some incredible stories to tell...if you know where to look.

**Matt:** In the spirit of the Battle of Britain and the incredible way in which so many came together to stop the German invasion...we've collaborated with the Royal Air Force and the Royal Air Force Museum to create this episode commemorating the 80th anniversary of 15 September 1940.

**Katie:** The 15<sup>th</sup> of September was a defining day in the Battle of Britain and the Second World War. On that day the Luftwaffe launched their largest bombing assault yet...500 enemy planes attacked in one day, aiming for key targets in London and the southeast.

The Nazi war machine's rapid advance through Europe had recently culminated in Allied defeat in the Battle of France. British troops had barely made it home thanks to the miracle at Dunkirk. For weeks, British air defences, including RAF fighter pilots, had been countering mass air attacks by the German air force, and everyone knew what was at stake.

**Matt:** So how did it all turn out? Well, that's not really untold history, is it? The Battle of Britain is well remembered, as it should be, and I think it's fair to say that most of us know at least a bit about the skilled RAF pilots whose efforts defended Britain, thwarting the Nazi plan to occupy us, and helping to turn the tide of the war.

In fact, that famous Churchill speech, "Never was so much owed by so many to so few," was actually delivered on August the 20th, in the first weeks of the Battle of Britain, months before it was won. So you could say we've been remembering and commemorating that historical campaign since it started.

**Katie:** Our Ministry of Information pamphlet was published in 1941. The memory of the Battle of Britain was still fresh in the public's mind, and we still had a few years still to go before the war was over. This account gave people a powerful story of British resilience and victory to remember as the war raged on.

The updated illustrated version of the booklet sold more than 2 million copies at home and 15 million overseas and was a great success, with the public clamoring for copies. People wanted to read about and remember the pilots, aircraft, and tactics that turned away the German invasion.

The pamphlet is still a great read if you want a play by play of attacks and defence and flight formations.

**Matt:** But that's not what we're going to focus on in this episode. As always with this podcast, we're going to take a closer look at Battle of Britain stories you may not have heard: stories from our collection as well as those researched by our colleagues at the RAF and RAF Museum.

**Katie:** Our first story is about three incredibly brave women who served in the Women's Auxiliary Air Force during the Battle of Britain.

**Vicky Iglkowski-Broad:** So the women that I'll be talking about today are Elspeth Henderson, Joan Mortimer and Helen Turner. And I feel like they're kind of largely now forgotten from history. So today I want to talk about them and try and help us remember these amazing pioneering women.

I'm Vicky Iglkowski-Broad, Diverse Histories Record Specialist at The National Archives.

They were only three of six women to actually get the Military Medal from the WAAFs in the Second World War. So that they're incredibly kind of notable and were recognised within their own lifetime, but possibly largely forgotten about now.

**Katie:** Elspeth, Joan, and Helen were everyday women who wanted to contribute to the war effort, so they joined the Women's Auxiliary Air Force and threw themselves into their work at RAF Biggin Hill, the airbase where they were stationed.

**Vicky:** They were fundamental to the airbase, keeping contact lines open. So largely they worked in the telephone departments, which in some ways might seem kind of mundane to us now, but actually was completely crucial to keeping the contact lines open, for making sure that there was communication between air bases and that people knew what was happening.

**Katie:** When you imagine the heroes of the Battle of Britain, young women may not be who come to mind, but in fact women were critical to the entire war effort, and served in many different roles during the Battle of Britain and the entire Second World War.

**Vicky:**

I think people do tend to know about the role of women in the Second World War. But when you say something like the Battle of Britain, they would assume that women weren't involved, that the battle side of things, and the frontline of it would have involved women less. But actually what the story of these women show is that they were putting themselves in incredibly risky positions and willing to fight as hard as they could to protect the people that were flying the planes. So I think the role of women is massively underestimated.

The First World War really set a precedent for women's involvement in military action. In the First World War many of the ways that women were involved were almost kind of trialed towards the end of the war. And it seems that in the Second World War, they were able to kind of pick these things up and kind of run with them pretty quickly, like the Women's Land Army and other services that developed towards the end of the First World War. So actually there was a precedent for women being involved and there were numerous services that they were involved in, but one of significant ones was, the Women's Auxiliary Air Force or the WAAF. And that was kind of like a partner organization to the Royal Air Force or RAF. And it was founded in June, 1939, so towards the beginning of the conflict.

Women were really keen to support the war effort. So I believe there were well over a hundred thousand women that joined the WAAF, and at a certain point there were over 2000 enlisting a week. So it was really quite a compelling thing for some women to get involved with and to feel like they were doing their bit. The WAAF didn't serve as air crew, but they did undertake really fundamental roles. So they were drivers, they were telephonists, cooks, orderlies, lots of the kind of stuff that was really the backbone of running these services.

**Katie:** While these roles might not sound dangerous, they actually placed WAAF members in really risky situations. These airbases and other military installations where these women worked were primary targets for the German air force, who knew they needed to cripple the RAF in the sky and on the ground in order to win.

On the 30th and 31st of August alone, 800 Luftwaffe planes took off from France on a mission to destroy key targets...including RAF Biggin Hill, where Elspeth, Joan, and Helen were working. And it's their courage and commitment to their duties during these attacks that would earn them their Military Medals.

**Vicky:** So this is on the 30th of August, 1940, very much in the middle of war. And looking at the operational records, by all intents and purposes, it was a normal day. Up to this point, it was very much the standard procedure, the days before you get a depiction of the weather repeatedly, but nothing else majorly happening, but at 8:00 PM, the kind of peace was disturbed.

A low level bombing attack was carried out by the German Luftwaffe on the station. The raiders dropped 16 high explosive bombs according to our operational records. They landed around the air base. They damaged the workshops, the transport yards, the stores, the barracks, the armory where, actually, Joan was based at the time. So it was really quite a substantial attack on the air base.

**Katie:** RAF pilots were the main defence against incursions by German bombers, but they needed ground crew to help them to take off and land and stay informed while they were flying. If Elspeth, Joan, Helen, and others like them had abandoned their posts as the bombs dropped around them, the pilots would have been left flying blind.

The RAF pilots and the ground crew had such different responsibilities during the battle, but one shared experience would have been chaos and adrenaline and the need to keep a cool head in rapidly changing circumstances.

When fighting was most intense during the Battle of Britain, the ground crew would be helping each pilot take off up to four times a day. The pilots flew alone in their aircraft at 340 mph with enough ammunition to fire for a total of 14 seconds. The close combat meant they had to dive and turn so much that blacking out due to G forces was a common problem. One RAF ace's rule for engagement was to wait to fire until you were close enough to the enemy pilot that you could see the whites of their eyes. Getting shot down meant instant death, dying in flames, or parachuting to the ground, if you were lucky. Efficient ground support was critical.

And while the pilots were risking their lives in the sky on 30th and 31st August, the WAAF were carrying their duties as bombs exploded right outside their stations.

**Vicky:** Although the women survived, they were really under fire and running their roles in incredibly difficult situations. So on this day, 39 people ended up killed and 26 wounded. But what we actually learned is that this was the first of six attacks across three days.

So this was really the tip of the iceberg of what these women were about to face. On the 31st of August, the raids continued, there was a direct hit on the operational room. And that's where the telephones service was running from. So again, these women were very directly targeted. And by the 1st of September, this was continuing. Joan Mortimer was in the armory when another air raid sounded. And despite it being targeted at the armory, she remained by her telephone switchboard, replaying messages to the other posts around the airfield to keep them in communication, to let them know what was happening.

Supposedly Joan Mortimer after this picked up a bundle of red flags and hurried out to mark where the unexploded bombs had landed, so that the incoming air crew could land safely and not land on these unexploded bombs. So she was incredibly heroic as were the other women here, and they all continued their roles in incredibly trying circumstances.

I think reading these records makes you think, what would I do? Would I be brave enough? And I think it's very easy sometimes to think we would. But really, I don't know. I think it's incredibly courageous of these women to keep going. I have read interviews with some of them from their later life where they said, "What else could we do?"

I think that with the Battle of Britain the, the German forces were kind of so close to home that there was a real sense of threat to the everyday way of life. And I guess these women and other people that were reacting to this attack on the air base would have possibly felt that they were the last line of defence and there was something really to fight for.

**Katie:** Vicky estimates that about 15,000 people were awarded the Military Medal during the Second World War. Only six were members of the Women's Auxiliary Air Force.

**Vicky:** So I think that says how rare it was for women to be acknowledged in that kind of way. And indeed there was apparently controversy at the time that the Military Medal was seen as a man's medal. And so for these women to get it, I think was incredibly important to acknowledging the efforts they went to, but possibly quite controversial in some senses in their own lifetime.

**Katie:** Elspeth, Joan, and Helen all lived through the war, and when it was over, they returned to their lives and careers, and all lived to an old age, as far we know. It's not the way you might expect a dramatic war story to end, but that just further reminds us of

the thousands of everyday women who bravely stepped up and left their normal lives behind for a time in order to support the war effort and do whatever they could to help defend Britain against the German invasion.

**Vicky:** Researching these women's stories was quite interesting because for the Second World War, we generally have operational records. We have less about individuals and the personnel side of things. So I used the record book for Biggin Hill in our series Air 28 to give descriptions of the day to day running of the air base. And that's where we can see the dramatic enemy attack and how it's described in the actual records. And that shows us the kind of extent of the drama and what these women were operating under, the conditions they were in. And then there's also the citations for their Military Medals that can be found in The London Gazette as well. And that gives a kind of sense of why they were awarded what they were. So in that record, it said that they were awarded the Military Medals because they "remained at the posts and calmly carried out their duties; they displayed courage and an example of a high order."

The story of these three women is really important, I think partly because we forget the roles that women did in the Second World War. And maybe when we read about them, we don't understand the fundamental importance of operational roles or telephonists in actually keeping these operations running and making sure that people on the front line did have the right level of communications, were in contact, had the right information. So really what it made me realise was the fundamental importance of some of the women's roles in a way that I hadn't understood it personally. And I think it would just be good if more people could know about these women's courage and dedication

**Matt:** A fighter pilot's job in the Second World War was incredibly dangerous. It required a high level of training and skill. And not everyone who entered training as a pilot qualified to fly the RAF's Hurricanes and Spitfires.

But if the RAF wanted to deny the Germans control of the air, they would need far more skilled fighter pilots than they could muster from Britain alone. From early on in the war, pilots from Europe and the Commonwealth played a critical part in their mission. RAF pilots joined from Australia, New Zealand, Canada, India, South Africa, Jamaica, Ireland, the United States, Poland, Belgium, France, Czechoslovakia—which is now the Czech Republic and Slovakia—and South Rhodesia—which is now Zimbabwe. The many Polish and Czech airmen who fought alongside the RAF were particularly renowned for their courage and charm.

In 1940, during the long summer of the Battle of Britain, a group of pilots from the Indian Air Force arrived in England to join the RAF and the Allied fight against the German Luftwaffe. The British forces had lifted their “colour bar” in 1939, and started recruiting Black, Asian, and Minority Ethnic pilots from the Commonwealth the following year. Of the 24 Indian pilots who were first to join, eight of them qualified as RAF fighter pilots.

**Lucia Wallbank:** They’d lost a number of men in the Battle of Britain. They knew that they needed a mass air force. So they started recruiting people from around the world.

**Matt:** Each of these individuals must have had their own reasons for joining the RAF in the face of great danger and a complicated relationship between Great Britain and India, which was still a British territory.

For Mahinder Singh Pujji, it was a chance for adventure.

**Lucia:** It was in about 1939 he saw an advertisement in a newspaper for the Royal Air Force and decided to join up.

**Matt:** This is Lucia Wallbank, Assistant Curator at the Royal Air Force Museum. She’s been researching the story of Mahinder Singh Pujji and other notable Black and Asian pilots of the RAF.

**Lucia:** He didn't initially tell his parents that he was going to do that, and they were a bit worried about him being killed. And he just told them that the risk of death was part of the adventure

**Matt:** Pujji was one of the first Indian Sikhs to volunteer for the RAF in the Second World War. There’s a number of photos of him from this time, posed with the planes he flew, wearing his turban and his uniform proudly.

Pujji was born in the Punjab region of India in 1918. He began flying as a hobby pilot when he was only 18, and went on to fly for Himalayan Airlines and the Indian Air Force before he was recruited to the RAF.

**Lucia:** So I have a few quotes from him. You know, he said to himself, “I am by nature an adventurous person, and I accepted the challenge.” He also said, “I must confess, I



wasn't terribly interested in politics at that stage. I knew Hitler was not a good man and that my volunteering to fight would be good for India." So he was aware of what was going on at the time and what was at stake. But in interviews, he's always said that his main motivation was his love of flying and seeking adventure.

Pujji was commissioned as a Pilot Officer in August, 1940. So he began flying after the Battle of Britain. He served in 43 Squadron, 258 Squadron. Initial duties were offensive fighter sweeps into occupied France from Britain. Later on, he was posted to India in 1942. And then to Burma in 1943, where he was undertaking tactical reconnaissance missions for number 6 Squadron.

**Matt:** In 1945, Pujji earned the Distinguished Flying Cross.

**Lucia:** So the citation said acting "Flight Lieutenant Mahinder Singh Pujji: this officer has flown on many reconnaissance sorties over Japanese occupied territory, often in adverse monsoon weather. He has obtained much valuable information of enemy troop movements and dispositions, which enabled an air offensive to be maintained against Japanese troops throughout the monsoon. Flight Lieutenant Pujji showed himself to be a skillful and determined pilot. He always displayed outstanding leadership and courage." And he often said in interviews how proud he was to receive the DFC.

**Matt:** After the war, Pujji contracted tuberculosis and was invalided out of the service in 1947. He returned to India to recover and decided to stay. He continued flying in a civilian role, and apparently his sense of adventure was still alive, because he competed in quite a few air and gliding races, setting various records throughout the 1950s. When he retired in 1974, he came back to the UK, and settled in Gravesend, in Kent.

**Lucia:** He gave a lot of interviews, so there's a lot known about him. He's quite a larger than life character. He was a very funny man, and he liked to talk about his service.

He was one of probably the only Sikh pilots wearing a turban whilst he was flying operationally. He had a turban on in the aircraft. He had wonderful stories, and he had this story about how his Hurricane was shot down. And he managed to make it to Britain over the Channel, and you know, he'd been shot and he escaped, he was getting more serious injury because he had this turban on. In order to enable him to wear the turban his ground crew helped him. He said, "I thought I was a very religious man. I shouldn't take off my turban. The British were so nice and accommodating. I had a special strap

made to hold my earphones. I used to carry a spare turban with me, so I would have one if I got shot down.”

Pujji always said in his interviews that he admired the British people, he admired their resilience during the Blitz. He said, “Everybody was loving, wonderful. In the evenings. We had VIP treatment. They wouldn't let us pay for tickets in a cinema and in restaurants, we got sugar, which was rationed. People saluted me and called me Sir.” He also said, “I never liked English food. And hardly take any lunch or dinner. The authorities asked what I wanted. And the only thing I could think of was chocolate. It was rationed but I was supplied with extra and was given two eggs for breakfast.”

He did say that people found him a curiosity, but at the same time they respected the fact he was an officer and they would salute him. He said that the RAF officers respected him. You know he said, “The RAF officers treated me better than anyone else, but that was perhaps because I wore a turban and was a bit of a novelty.” But he was very complimentary of how he was treated during the war and also very complimentary of the British people.

He felt that how he was treated during the war was much better than his experiences living in Britain in later life. In an interview that I was reading, he contrasted that experience in wartime with what he was experiencing in Britain today. So he said, he said, “Now the man in the street, things, every Indian is illiterate. This young policeman started shouting at me as if I was stupid. Then I saw him across the road with a white driver being very polite. I didn't want to tell him I was an officer. He would have saluted me during the war. This is not the England I knew, but maybe if my story is told then people would remember us and what we have done.”

**Matt:** Mahinder Singh Pujji passed away in 2010 at the age of 92. In 2014, a statue of him as a young pilot in his uniform and turban was installed in Gravesend to commemorate his service.

Around 200 Indians volunteered to join the RAF in the Second World War, and 25,000 fought alongside allied forces in the Indian Air Force.

Pujji's story has some parallels to the story of Vincent Bunting, a Jamaican pilot who volunteered for the RAF at about the same time as Pujji. Bunting was also born in 1918, and like Pujji, he was 22 years old when he enlisted.

**Lucia:** Like Pujji, he arrived, he arrived in the UK during the Battle of Britain. But he didn't actually fly operationally during the battle.

**Matt:** Vincent Bunting was one of thousands from the Caribbean who volunteered to serve in the RAF during the Second World War. Around 450 volunteered for air crew, including Bunting, and 5,000 individuals served as ground crew. Women from the Caribbean also joined the WAAF. This was partly a result of active recruitment by the RAF in the Caribbean.

**Lucia:** The RAF didn't actually officially begin recruiting in the Caribbean until November 1940. So Bunting signed up before they were formally recruiting. He'd come to Britain, he paid his own passage to Britain...So pays his own passage, travelled 4,000 miles. So I suppose that shows how keen he wants to get involved in the war effort.

Unlike Pujji, we haven't seen any interviews with Bunting so far in which he mentions any of his personal motivations.

**Matt:** But we do have plenty of personal testimonies from other airmen who traveled from the Caribbean to serve. Many of these accounts were used to create the RAF Museum's 2018 exhibition, Pilots of the Caribbean, which was curated in partnership with the Black Cultural Archives.

**Lucia:** For instance, there's John Blair, also from Jamaica. He was in 102 Squadron; he did a full tour of operations in bomber command. So he said about his motivation to sign up, he said, "We just knew deep down inside that we were all in this together and that what was taking place around our world had to be stopped. Few people think about what would have happened to them in Jamaica if Germany had defeated Britain, but we certainly could have returned to slavery."

John Blair said they weren't necessarily thinking about the empire. They were part of the empire, but they weren't thinking of it in terms of....you know, they knew what was going on with the world. They're listening to the radio, they're reading the newspapers, and they felt like they had to do something. So their motivations are just the same as many young men at the time around the world.

**Matt:** As far as we know, Bunting didn't have flying experience when he volunteered, so he trained as a pilot once he arrived in England.

**Lucia:** He served in several squadrons flying Spitfires, eventually posted to RAF Biggin Hill with 611 Squadron.

**Matt:** Bunting's combat report in the RAF Museum archive includes the highlights of his service. During the war, he was soon promoted to Warrant Officer, 132 squadron, also flying Spitfires. He also served in 154 squadron, flying Mustang IV fighters.

**Lucia:** Bunting was commissioned as an officer in April 1945. He stayed in the RAF after war as a number of them did. Eventually he retired in 1948. He'd reached the rank of Flight Lieutenant. He married an English woman, moved to Antigua, and then eventually he went back to Jamaica where he went on to become a police superintendent.

**Matt:** Also in the RAF Museum archives is a photograph of Vincent Bunting with Group Captain Adolph Malan, a white South African RAF pilot, at RAF Biggin Hill in January 1943. Malan is worth noting because he highlights how many of the officers who came from outside the UK to fight with Britain then returned home and used their leadership skills to organise for political change.

Malan was an expert fighter, leader, and tactician; in fact he was one of the RAF's leading aces. After the war, he returned to South Africa, where he became the leader of the Torch Commando, an anti-racist, anti-fascist organisation created in opposition to South African Apartheid.

**Katie:** A quick aside: if you're wondering who was \*the\* leading ace of the RAF and Commonwealth Air Forces in the Second World War, it was another South African, Squadron Leader Marmaduke "Pat" Pattle, whose record shows he shot down over 40 enemy aircraft in North Africa and Greece. And that's only confirmed, not including the probable, shared, or partial hits. Ok back to our story.

**Lucia:** It's interesting that a lot of the men who had served the RAF, when they returned to their native countries, they became involved in nationalist movements and you know began working against the British rule in those countries. But at the same time, they were always proud of the fact they'd served in the Royal Air Force. So there's some famous examples. There's Flight Lieutenant Michael Manley, he became the Prime Minister of Jamaica, and there's Flying Officer Errol Barrow; he became the Prime

Minister of Barbados. So it's interesting. They're very talented young men, and they've taken the RAF ethos and they've gone back to the native countries and made a difference there. But at the same time, they're proud. They're proud of their service in the RAF.

John Ebanks, he was in bomber command as navigator, he said, "I was at a gathering recently when a fellow came up to me and said, 'Oh, so you're one of those who went to fight for King and country.' I got very angry, and I told him in no uncertain manner that I did not go to fight for King and country. I went to fight for myself. I went to fight for freedom for Jamaica and for all the little countries of the world that would otherwise be controlled by bullies."

**Matt:** During the Battle of Britain, RAF pilots came from all over the world: Poles, Australians, Czechs, New Zealanders, and Canadians flew alongside Irish, Scottish, Welsh, and English pilots. Because the colour bar wasn't lifted until 1939, there were no Black, Asian, or Minority Ethnic pilots fully trained and ready to fly during Battle of Britain, but as we've seen from these stories that Lucia researched, West Indian pilots and Indian pilots were being trained that summer, making them part of the larger air force apparatus. These pilots would go on to fill vital seats in Britain's aircraft as the war progressed. 544 RAF aircrew were killed in the Battle of Britain, and without new pilots like Pujji and Bunting stepping up to fly these dangerous missions, the RAF would have emerged from the Battle of Britain victorious, but seriously weakened.

But it's not always easy to identify the records of Black and Asian pilots...and this is quite interesting....part of that difficulty is precisely because the RAF was integrated.

**Lucia:** When you look at the service records, they're not recording a person's race on them, but it's really difficult to find the individual stories, because their race isn't recorded in the records. But in the RAF Museum, we're trying to draw these stories out. So we're doing a lot of proactive collecting and we're interviewing people. It's part of a wider project that we have called hidden heroes where we're trying to tell stories of the whole diversity of the RAF. So we're talking about LGBT, Jewish, and Indian hidden heroes, for instance. It's really just a snapshot of what's out there though. So even though we're actively collecting and searching for these stories, there's so much more out there that we still need to know.

So we're not reinventing history; the stories are there, it's just drawing them out and highlighting them. Telling these really important stories, we're correcting the mistakes of the past.

**Katie:** And that is a great segway to our final story for this episode, about the talented engineers literally repairing the past by keeping a dozen historic Battle of Britain aircraft restored, preserved, and flight-worthy.

**Squadron Leader Singleton:** Hi, I'm Mandy Singleton. I'm a Senior Engineering Officer on the Battle of Britain Memorial Flight, which is the Royal Air Force's historic aircraft flight. I'm a Squadron Leader in the Royal Air Force.

So we have 12 aircraft, and we maintain them with lots of love and care. We try to make them as authentic as possible. We ensure that they're available for the general public to see, so we deliver about a thousand events, normally. Obviously this year is a bit different. So between air displays and flybys, and so people can see the Lancaster, Dakota, our Spitfires and Hurricanes—we've got two hurricanes—so that people can try to remember what went on. And they are iconic, we treat them as priceless artifacts. They are loved very dearly. So I have a team of 34 engineers, highly skilled, highly qualified, and we maintain to the very best of our ability. So one of the challenges with our old aircraft is maintaining them to today's standard, so that they are airworthy, fit and safe to fly in our airspace, while still looking exactly as they did during the war.

**Katie:** Keeping 80 year old aircraft authentic, airworthy and around for the future is no small feat of engineering and planning.

**Squadron Leader Singleton:** As you can imagine, you know, 12 aircraft, we want to keep these flying at least until 2035, and we're doing a lot of work to make it a lot longer. And in order to do that, we need to plan them very carefully and plan how we maintain them, how we use them. So they take a lot of looking after. We've only a small team of engineers, so about 35 engineers at the moment for 12 aircraft. And we have a lot of displays and flybys to meet, and that all needs to be balanced. And it's a constant challenge. So I will start planning my winter maintenance early in the summer; start planning what spare parts I'll need what specific skill sets I need from engineers, and what support I need so that we can put the plan together. That hopefully means that at the end of winter maintenance, we can then fly happily all season without too many problems.

Every day is different. We have a general battle rhythm, what we would call routine. So during the winter, we'll do in depth maintenance. So because we don't fly our aircraft in bad weather, in the rain and cold, winter is a perfect time to do most of the maintenance. So this is inspecting or fixing and replacing components. So we do that from October through to early spring, March, maybe April, and then we'll do our very best to the end of spring, start generating aircraft, ready for the air crew to start their training. So that by the time the beginning of the summer season and the display season starts, we've got not only serviceable aircraft, but trained air crew. During the summer, that's the more dynamic part of our job when we are delivering hundreds of air shows and flybys for everyone to enjoy. So we've got a lots of travel, excitement, we get to go meet lots of aviation enthusiasts. And one of the really important things that we do is meet lots of the veterans and ensure that we give our time and we listen to their experiences and we, and we keep their stories alive.

**Katie:** Remembering these planes and what they accomplished also means remembering the people who made them possible:

**Squadron Leader Singleton:** So there were 3,000 pilots that flew during the Battle of Britain and every single one of those aircraft needed to be maintained. And they were maintained by men and women on the ground. There's quite a famous phrase, which says the few were supported by the many. And they did everything from starting the engines before the air crew got to the planes, strapping the air crew into their parachute, so they could get a speedy getaway. They serviced the aircraft, made sure they were full of fuel, made sure they had their armaments on and maintained and repaired them. They looked after the airfield as well, they made sure the airfield was clear and that it was the aircraft could operate out of it.

**Katie:** 3,000 pilots were supported by hundreds of thousands of people on the ground, including civilians. One notable individual among them was engineer Beatrice Shilling.

**Squadron Leader Singleton:** Yeah. Beatrice was one of the greatest engineers of her time. It's fascinating actually that she was only one of two female engineers who were going through Manchester University at the time, and she graduated with her Master's. So she was a real pioneer. And during the Battle of Britain, we used Spitfires and Hurricane aircraft extensively, and they were both fitted with a Merlin engine. Now, when the air crew used to go into really steep dive, because the carburettors are gravity fed, it used to cause the engines to flood, and Beatrice invented a quite simple device, but it was very clever, that controlled the fuel into the engine and stopped it from

stalling, which allowed the air crew to have greater maneuverability. And so, yeah, she undoubtedly saved many lives. I mean, it was only a stop gap. But she and her team then went on to invent a permanent repair, a permanent modification to the engines. So yeah, she was definitely a very inspirational lady.

**Katie:** Because the demand for engineers and mechanics was so high during the war, women were recruited to build planes, keep them airworthy, and make them as efficient and deadly as possible.

**Squadron Leader Singleton:** 500,000 women were conscripted or recruited across the three services. Many of them went into engineering and into aircraft specifically as well on the ground. Another interesting fact as well is the industry started to recruit women into their training programs as well because there was a general shortage of engineers. So it was a great opportunity for women.

So everybody had their part to play in the Battle of Britain. Um, and it was, we hear an awful lot about the danger that the air crew face, but the people on the ground faced equal dangers, whether they were on the coast spotting planes, whether they're on the air fields and the, the early part of Operation Sea Lion, which is what the Germans named their invasion of Britain, they targeted the airfields. So it was often dangerous. Many people lost their lives. So it's really important that we remember everybody and what everybody contributed to the Battle of Britain.

**Katie:** We asked Squadron Leader Singleton if she saw herself and her crew as continuing the legacy of the ground crew who built and maintained these planes during their heyday.

**Squadron Leader Singleton:** I certainly do, and both myself and the team try very hard to maintain them in the same way that they were during the war, and preserving their authenticity is really important to us. And every time we climb on board these aircraft, and I'm thinking specifically the Lancaster, it brings to mind the images of what it must have been like to maintain them and to fly them during the war. And I mean, not only must it have been challenging under the pressure of war. But also, it must've been really frightening and the airfields were often targeted. And so it was quite dangerous work and you knew as well, how important it was to generate the aircraft for fit for flight. You know, the defense of our nation relied upon them. I mean, that's a big responsibility. And it's something you can't forget when you're working on these aircraft every day.



**Katie:** Besides helping us remember the people who maintained and flew them, the aircraft of the Battle of Britain Memorial Flight help us commemorate the planes themselves.

**Squadron Leader Singleton:** So the Hurricane, Spitfire and Lancaster all iconic aircraft, and they made a big impact in World War II, and they are all British designed. They're success stories really of British engineering. So the Spitfire for example, was designed by a British engineer, a gentleman called Reginald Mitchell, and there were over 22,000 Supermarine Spitfires built. They played a crucial role defending our country and, you know, and they were designed to be pitted against the German Messerschmitt Bf 109. And then later on, as the Germans improved their capabilities, our Spitfire managed to match it throughout the war.

For me, leading and managing this team is a privilege. And it's not just about fixing aircraft. It's about keeping BBMF at the forefront of people's minds. It's definitely a career highlight for myself.

And I think as we go through history, it's really important to understand what's gone before and to learn from it. You know, we don't ever want to be in that position again. And this is a living memory, and our future generations need to understand what's gone before as well, and the sacrifice that people made for our freedom, and they are beautiful pieces of British engineering as well.

**Matt:** Thanks for listening to On the Record. I hope this episode taught you a few things about the Battle of Britain you never knew before and inspired you to learn more about the hundreds of thousands of men and women from different countries and backgrounds who came together to fight and defend Britain in the summer of 1940.

If you'd like to go deeper on any of these stories, visit the websites of The National Archives, the RAF Museum, and the RAF, and search for 'Battle of Britain'. You'll find stories, documents, research, oral histories, and more.

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