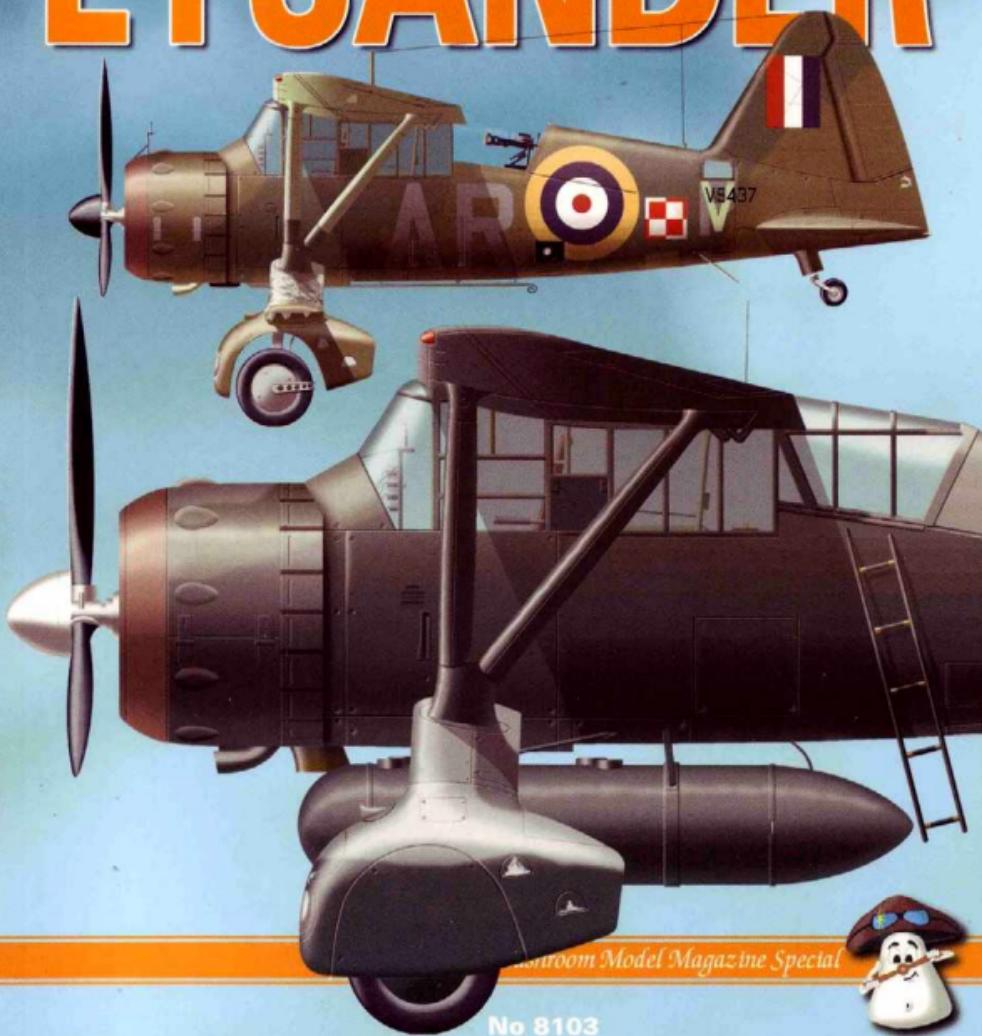


James Kightly

ORANGE
SERIES

Westland

LYSANDER



Airroom Model Magazine Special

No 8103



James Kightly

**Colour illustrations by
Artur Juszczak**

Westland
LYSANDER



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Artur Juszczak, Po. Box 123,
27-600 Sandomierz 1, Poland
e-mail: arturj@mmpbooks.biz
for

Mushroom Model Publications,
36 Ver Road, Redbourn,
AL3 7PE, UK.
e-mail: rogerw@mmpbooks.biz
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Editor in chief
Roger Wallsgrove

Editorial Team
Bartłomiej Belcarz
Robert Pęckowski
Artur Juszczak

Colour Drawings
Artur Juszczak

Scale plans
Dariusz Karnas

Printed by:

Drukarnia Diecezjalna,
ul. Żeromskiego 4,
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Previous page. Westland Lysander Mk.IIIa G-BCWL while based at IWM Duxford and operated by the Aircraft Restoration Company in Air Sea Rescue colours. This aircraft is now in the USA. James Rightly.

Back cover. Shuttleworth's Lysander chases the moon, most appropriately for an aircraft painted in one of the moonlight Squadrons colours. Rob Leigh

Dedication

To the crews that flew and maintained the Lysander around the globe - and to all of the restorers that have kept at least one Lysander in the air, in different places and at different times for the past 40 years.

And in memory of Steve Young, aviation enthusiast and friend.

8th April 1969 - 24th July 2005.

Acknowledgements

This book was started in Oxfordshire, continued in Ontario, and in Oxfordshire again, and later in British Columbia. It was finished in Victoria, Australia – which rather delayed things!

The Lysander is one of those famous but under-regarded types about which ‘everybody’ knows ‘something’. Sadly, many of those facts prove not to be facts, and sorting truth from fiction is a particularly challenging if not fiddly task for this class of aircraft. Many highly regarded authors and references perpetrate errors of varying degree of magnitude, and I have tried hard to provide the correct information, or where we cannot prove it, to say that we don’t know. For any errors contained, we apologise, and would appreciate them being brought to our attention so that we can correct them in any future editions.

Numerous people have provided snippets or chunks of information, often previously unpublished, and for that they have my sincere gratitude. I have also chosen to incorporate a number of firsthand accounts to bring the story to life. I have provided a bibliography of worthwhile and useful publications, which can be taken as a qualified recommendation.

Many people have assisted, and I wish to record my thanks to them here. John ‘Smudge’ Smith, who answered an array of detailed questions overnight; Colin Swann and John Romain of the Aircraft Restoration Company, Andrew Appleton for US restoration input. Fred Ballam, of the Westland Archives, without whom this book would be a lot shorter. The BBC ‘People’s War’ website proved a mine of anecdotal information which gives a grassroots view of Lysander operations. Jim Buckel sent a regular stream of photos and answers on the CWH Lysander and a CD of 600 pictures to keep me going, not forgetting the CWH Lysander team themselves. Don Clarke and Mike Grierson for the Middle East photos. Alex Crawford was kind enough to provide various pointers despite having his own MMP books to write. Artist Don Connolly for permission to use a copy of his painting, Christopher S. Eldridge who spotted the exhaust oddity on the Air Warfare Forum. Jerry Shore of the Fleet Air Arm Museum, George Paul of IWM Duxford, Tony Kearns for help with the Irish end, Pam & Jim Laing, Warren & Mary-Lee Laing for their hospitality while working on the book. The other members of the MMP team. Brian Marshall, Tony Osbourne and Jagan Pillarisetti all added key pieces to the jigsaw. Monica Walsh of the RAAF Museum archive, Andy Simpson and the other helpful staff at the RAF Museum and Jodi Ann Eskritt, Curator, RCAF Memorial Museum.

Daniel Stockmans of SOT, Harold E. Wright of St John Heritage provided Belgian and Canadian input respectively. Andy Sephton and Chris Morris plus the Shuttleworth crew, for the work, answers and access to their Lysander. As ever, Jerry Vernon responded to a number of vague questions with a wealth of information. Jochen Verschoore made some Belgian connections for me, while Joao M. Vidal of the Portuguese Air Force Museum threw some illumination into an obscure area, and Anthony G Williams, gunnery expert, answered a couple of tricky queries.

My thanks to the various photographers who have kindly allowed the use of their photos here, and I am indebted to the various authors whose works are listed in the bibliography. I am also particularly greatful to all those whose words I have quoted throughout the text, without whom the book would have far less of a human story. I also thank posters on the Air Warfare, Planetalking, Pprune and Flypast Forums for feedback on a number of areas. Finally, and most important, my wife Bev Laing for proof reading and especially all the other support a partner gives.

James Kightly,
Melbourne, 2006

Abbreviations

A&AEE	Arms & Armament Experimental Establishment	MC	Military Cross
AA	Ack-Ack (Anti aircraft gunfire)	MM	Military Medal
AC	Army co-operation (Squadron)	NAS	Naval Air Squadron
ADC	Aide de Camp	OTU	Operational Training Unit
AOP	Air Observation Post	POW	Prisoner of War
ARC	Aircraft Restoration Company	RAE	Royal Aeronautical Establishment
ASR	Air Sea Rescue	RAF	Royal Air Force
AWM	Australian War Memorial	RAAF	Royal Australian Air Force
BEF	British Expeditionary Force	RCAF	Royal Canadian Air Force
CAM	Canada Aviation Museum, Ottawa.	REAF	Royal Egyptian Air Force
CBE	Commander of the British Empire	RNVR	Royal Navy Volunteer Reserve
CFS	Central Flying School (RAF)	TAG	Telegraphist / Air Gunner
CMF	Canadian Museum of Flight, Langley	TT	Target Tug
CWH	Canadian Warplane Heritage	SAS	Special Air Service
DFC	Distinguished Flying Cross	SBAC	Society of British Aircraft Companies
DSO	Distinguished Service Order	SD	Special Duties
EATS	Empire Air Training Scheme	SOE	Special Operations Executive
FAA	Fleet Air Arm	SOT	Sabena Old Timers
GOC	General Office Commanding	SM&PI	Sikorski Museum & Polish Institute
HM	His/Her Majesty	SIS	Secret Intelligence Service
IAF	Indian Air Force	TNA	The National Archives, UK (Formerly Public Record Office)
IAS	Indicated Air Speed	USAAF	United States Army Air Force
		WAAF	Woman's Auxiliary Air Force

Introduction

When the Westland Lysander first flew it was something out of the ordinary, both in looks and in high and low speed performance; ranging from 55 to 300mph. The Lysander is also a unique aircraft technically. To this day it was the only production aircraft with fully automatic flaps actuated by aerodynamic slats. Conservative in its structure, it was innovative in its aerodynamic concept. Imaginative design resulted in an aircraft with a phenomenal speed range. Although a failure in its original role, the unexpected nature of the war it was engaged in meant that it was to find a niche in two unforeseen tasks: air-sea rescue and dropping off or picking up agents from enemy-held territory, both of which will ensure the Lysander will not be forgotten.

During the war its unique silhouette ensured that it was easy to distinguish, and even today, the Lysander is a distinctive shape in museums - and thanks to a few dedicated organisations - in the sky. It was popular with ground crew and aircrew, and the pilot's position was a magnificent throne from which to aviate. Good pilots explored the aircraft's amazing handling abilities and achieved many unusual and often incredible feats with the Lysander, although it could, and did, bite the overconfident pilot.

Not able to operate successfully in war without the advantage of air superiority or the cover of darkness, it nonetheless managed to fill vital roles and undertake mundane tasks from the sub-zero snows of Canada to the dust, heat and monsoon rain of India. We will try to sketch in the background to the history of the Lysander, aiming to shine a light on some of the lesser-known areas of its career. We also will try to provide a detailed look at the type, of interest to the modeller, engineer, and we hope, pilot.



*The prototype Lysander seen at Westland's home of Yeovil, Somerset.
RAF Museum P9266.*

Concept & prototype

The Lysander was essentially the response to a WWI concept. It's an old cliché that the Generals always prepare to fight the last war, and it is important when studying WWII and pre-WWII history to bear in mind the mindset of the allied armed forces: namely, experience of static trench warfare and a war of attrition, planned around the fixed Maginot line. During WWI, Artillery Observation, 'Art-Obs' or 'Arty R' for Artillery Reconnaissance, was essentially the main role for military aviation – helping the artillery see their fall of shot. That's what the Generals wanted, and the development of aerial reconnaissance defined the role of the air arm. Scout aircraft (later renamed fighters) were originally there to stop these nosy aircraft and crews.

Throughout the inter-war period the Air Ministry had specified army co-operation aircraft of conservative design. Only two aspects had changed since WWI: the first was that even more (minor) tasks had been added to the requirements, and the second was a need to act in an 'Air Police' role. This latter requirement was brought on by the RAF's stratagem of taking over many of the Army's frontier jobs, managing the margins of Britain's dominion. As the British enjoyed complete air superiority on these edges of the empire, nothing practical could yet be learned about operating army co-operation aircraft in an evenly-matched war.

Specification A39/34 issued in late 1934 was intended to result in a monoplane replacement for the Hawker Hector and Hawker Audax biplanes (which had entered service in 1932), and this type was expected to be suitable for worldwide use, the RAF's zones of operation including the Indian sub-continent as well as Western Europe. Operation from Canada to Finland probably wasn't expected, although the Far East may well have been. The specification also asked for the aircraft to have rear defence, bomb racks, the ability to dive bomb, and

*Prototype Lysander K6127
Showing the form it was
first flown in, with wooden
two bladed propeller and
uncovered undercarriage.
RAF Museum P9263*





the paraphernalia of army co-operation of the day: photographic fittings, radio and a message pick-up hook. Wanting everything, the requirement expected the aircraft to also be able to serve as a long range and night-fighter.

Few companies would have believed it a good contract, as only a few aircraft might be ordered and it would probably become outdated quickly. Only Westland and Bristol (with their Bristol type 148) tendered prototypes for the contract, Avro and Hawker dropping out early on.

The Westland company had a good history of aircraft production as a subcontractor, but a less happy one of getting their own designs into production. Westland was at this stage a wholly-owned subsidiary of the family firm Petters

The upper view clearly shows the unspatted wheels, and absence of cowl flaps, as well as the primed but not painted fuselage fabric. A semi-spat seems to be fitted over the tail wheel. This looks different to even the prototype's final tail wheel spat design.
RAF Museum P9264.

It is often easy to overlook how clean the design was, but this angle on the effectively 'unfinished' prototype shows how few excrescences there were from the start. RAF Museum P9265.



The other contender for the Contact, the Bristol 148 (see page 12) looks quite odd to our eyes, but serves to illustrate how odd the now familiar Lysander probably seemed when it was new.
The Transport Archive.



Ltd. Westland also had a new Technical Director, who had been imposed on the board. W. Edward W. 'Teddy' Petter BA was the son of Sir Ernest Petter, who himself was the son of the company's original founder, and Sir Ernest was Chairman of the Board. Teddy Petter was therefore in an unenviable position between his family and Westland's professional staff. It is worth noting that in 1934, the co-opting of Teddy Petter on to the board of Westland Aircraft Works by Sir Ernest caused the resignation of Robert Arthur Bruce, the highly-experienced and respected Managing Director, and Geoffrey Hill, a brilliant designer and power behind the 'Pterodactyl' series of prototypes. The works manager was also changed soon after, and the company was reconstituted by Sir Edward as Westland Aircraft Ltd in 1935. There is no doubt that Teddy Petter's arrival radically changed the course of the company.

Interestingly, Westland's first step in designing a response to A39/34 was to investigate what the pilots, engineers and ground crew 'in the field' wanted, a move not always regarded as desirable by the hidebound Air Ministry. Chief Designer Arthur Davenport, Teddy Petter and Chief Pilot Harald Penrose toured the army co-operation squadrons and gathered the pilots' and airmen's views. It is also possible that this was a shrewd move to build a sound working team of these three. Although Petter is often quoted as the designer, documents in the Westland Archives clearly show that Davenport led the design process.

The main challenge was to have a machine that would be fast enough in a modern war (and able to get about a battlefield swiftly) but which could also loiter and fly very slowly. Good views for the pilot and observer, plus the positioning of a wide range of army co-operation bits and pieces all added to the choice of a high wing design. Original ideas, including one with an under-



Fitted with the metal prop and spats, adorned with the RAF Hendon 'New Types' number '6' the Lysander is ready to debut. Westland Archives & RAF Museum P9267. Second prototype K6128 is seen here, during the A&AEE trials fitted with the stub-wings, stores carriers and some W.W.I era 112 lb High Explosive bombs. RAF Museum P9268.



A still from a Pathe film of the yet un-named prototype at Yeovil on a public day. British Pathe/ITN.

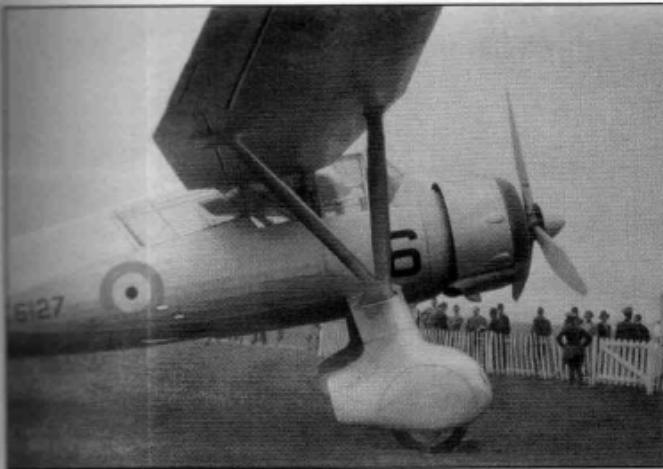


carriage that retracted into a stub wing, were examined in six design studies. Two prototypes were ordered of a fixed undercarriage design which bore the Westland P.8 designation. It was a well thought-out machine with a fascinating wing full of tricks to enable the required speed range, but the same wing was also to be the type's Achilles heel.

Shortly after the contract was won, in June 1935, Westland also received a subcontract to build 178 Hawker Hectors, a job that was originally intended for Avros, and previously Westland had been building Hawker Audaxes fitted with Gloster all-metal wings. These types were the Lysander's predecessors in army co-operation, and their comparative lack of short field performance had been one of the Army co-operation squadron pilot's complaints. Westland's performance here had counted for their success in getting the contract.

The first Lysander

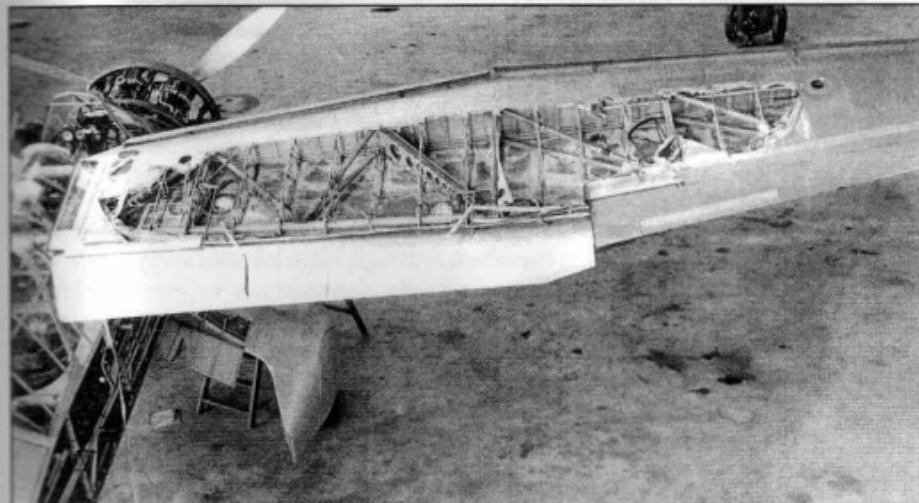
The prototype K6127 was first flown on June 15th 1936 (still known only as the P-8), just a year after the contract was given, but it was somewhat bare - without spats, cooling gills, or paint, and with a two blade fixed-pitch wooden propeller in place of the intended three blade variable-pitch type. The innovative wing with interconnected flaps and slots performed as expected, but there were instability issues, and the aircraft ran out of elevator authority on approach, so the engine had to be used to flatten out. Trim changes due to the wing arrangement were much greater than the wind tunnel tests had predicted. An increase in tailplane area was the first attempted fix, which then completely prevented flattening out just before touchdown when landing. After being painted and (mostly) properly clad, the aircraft attended a number of air events, in particular the RAF Display at Hendon on June 27th, and the SBAC show two days later, to great public effect, as well as being presented to HM the King at the A&AEE in July. However, all was not well, as modifications with elevator tabs still had not solved the stability problem.

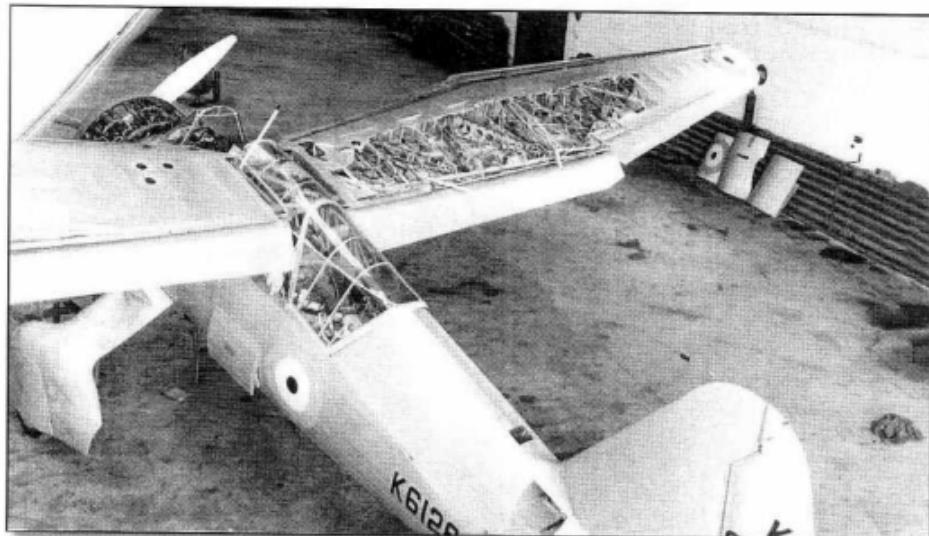


Left: The prototype at RAF Hendon. Note that on this side the 'New Types' number '6' is on the forward fuselage. This photo clearly shows the cowling without cooling gills. The angled framing of the observer's sliding canopy, also not carried over to the production aircraft can be seen.
James Kightly Collection.

A moving horizontal tailplane, replacing the second attempted fix of trim tabs, was fitted next in order to aid the trim. However, this caused a completely new problem: if power was applied for a go-around after an aborted landing, the aircraft pitched up and exceeded the control authority available. To overshoot, the aircraft had to be re-trimmed before applying any significant power. Penrose saw the risks for service pilots in wartime, but was over-ruled and a warning placard in the cockpit was regarded as a sufficient compromise under the pressure of wartime expansion and production.

Despite Penrose's serious concern over the handling risks, and probably due to the imminent threat of war, the Air Ministry awarded a contract for 144 Lysanders in September 1936, two months before the flight of the second prototype K6128, on 11 December. Penrose, being a test pilot, always demonstrated the Lysander to its maximum; and on occasion misled following aircraft and





*This page and previous.
The photos attached to
the A&AEE Report on the
incident that occurred to
the second prototype on
May 20th 1937. As well as
showing how much fabric
had been lost, and thus lift
(and, incidentally, giving an
excellent contemporary view
of the wing structure for
the modeller) the loosened
fabric on the port wing is
just visible in the second
photograph. The National
Archives, Avia I&637.*

perhaps other pilots into trying to emulate his '3-point take off' and climb at 45 degrees.¹

Trim difficulties were not the only serious problem with the type. On May 20th 1937, while flying the second prototype and undertaking diving tests, the pilot, Squadron Leader R W Collings, suddenly heard a loud report. The stick was snatched from his hand and the aircraft went inverted. Collings could not move the control column and had lost the top of his canopy. According to the official report; "He was having difficulty in leaving the cockpit when the aircraft steadied down after a second loud report. He then decided to right the aircraft, trimmed out of the dive, half rolled and brought it back to the aerodrome."

What had gone wrong? "60 – 90% of the top surface of the starboard wing had gone. The trailing edge portions of the ribs aft of the rear spar had collapsed. The port wing fabric top surface was wrinkled and loose and on cutting away the fabric it was found that a similar failure of the ribs had commenced."² The cause was the use of a trial lightweight fabric instead of the normal Irish linen. The phlegmatic Squadron Leader R W Collings earned an Air Force Cross for his skill and bravery. Although the return to the conventional Irish linen and fixing solved the problem, at least one other aircraft, as we shall see, later lost its wing fabric in Royal Navy use.

The competing Bristol 148 prototype flew on October 15th 1937, and its speed ranged from 62mph to 255mph, but its low wing and retractable undercarriage counted against it as the exceptional view and robust undercarriage favoured the Lysander.

The origins of the name 'Lysander' are mildly interesting in that army co-operation aircraft were given classical names, and Lysander was a Spartan general who had raised a fleet to beat the Athenian navy. He later was regarded as a diplomat of the ancient world. That aside, the probability is the name was chosen for its familiarity due to a popular song, 'the British Grenadiers', that runs: "Some talk of Hector and Lysander and heroes such as these."

Changing duties

On the German side, the Lysander's role was taken initially by the Henschel Hs 126, which was in many ways a very similar, high wing, two seat, radial-engine aircraft. It did sterling work for the Blitzkrieg forces while the Germans had air superiority.

Two factors changed the role of the Lysander and Hs 126. The first factor was that the observation role was split into three separate jobs. Artillery spotting became the province of lighter, often single-seat aircraft that 'popped-up' to observe fall of shot and used their small size and manoeuvrability to avoid enemy fighters and ground fire. In British use this was the Auster AOP series, while the Americans used the Piper L-4. Tactical reconnaissance became the job of a fighter type; sometimes with camera, or with a pilot taking notes, but usually a fast, armed single seater. The Lysanders were replaced by Curtiss Tomahawks, and this new fast observer role was developed with the Tomahawks in exercises through 1941 – 1942. Later, Allison-engined North American Mustangs were brought in. The third area, what can be regarded as battlefield mapping, became the task of the PR units: high, fast and aiming to avoid interception.

The second change in the Army co-operation role was the vital importance of obtaining and keeping control of the air. If you had it, your forces could undertake their tasks. If you did not, however good the aircraft and crews, attrition was unsupportable and your forces would simply have to operate without full data. There was no escaping the absolute need for air superiority. The Luftwaffe were able to continue to use the Hs 126 on the Eastern Front until 1942 (when it was replaced by the Focke Wulf Fw 189, with a much higher cruising speed of 317 kmh / 197 mph) and the Hs 126 was an effective aircraft while the Luftwaffe was able to stop enemy fighters interfering with it – otherwise, like the Lysander, it was horribly vulnerable. Similarly, the Lysander was a perfectly good aircraft, provided the RAF had air superiority; in Burma in 1942, unchallenged by enemy aircraft, it carried out its tasks. In May 1940 the lack of that fighter protection showed the same vulnerability that the BE-2 and RE-8 aircraft had suffered in the previous war.

The Fieseler Fi 156 Storch, another 1936 design, was another ingenious short field aircraft, and though not used by the Luftwaffe in the same manner as the Lysander, did undertake tactical reconnaissance among many other tasks.

A line up of early production Lysanders at Yeovil awaiting delivery to the RAF. The nearest aircraft is N1203 which went to 26 Sqn and next is N1205 which was used by 4 Sqn. The fourth, sixth and seventh aircraft in line are in mirror camouflage to the odd serialled aircraft identified, so must be even serial number machines.
Westland Archives





As can be seen here, British aircraft production in the 1930s still owed more to hand-building than mass production techniques. Lysanders undergoing assembly in the Westland factory. In the background are the contemporary Westland Whirlwind fighters also under construction.

Westland Archives.

Other types that were contemporary with the Lysander were the Douglas O-43/46 series for the US Army Air Corps, while the French and Japanese looked to fast low-wing monoplanes: the twin-engine Potez 63.11 A3 and the Mitsubishi Ki-15 respectively, the latter being a dedicated photo reconnaissance machine. The French operated the obsolete Mureaux 115, but despite the layout similarities with the Lysander and Hs 126, it was far more antiquated and almost completely ineffective. In the 1930s it is worth noting that autogyros were under serious consideration for the army co-operation role, but never really found their metier despite most combatant nations trialling them.

Production at Westland ended in December 1941, with over 1,600 built (1,400 by Westland plus 225 produced in Canada). It was the largest-ever run of (fixed wing) aircraft to Westland's own design. The first Lysanders were built at a fixed cost of £15,189 1s 1d per aircraft, but when production got going the cost dropped to £3,063 8s 5d each.³

Tony Robins of Yeovil⁴ remembers; "It was very exciting to see Westland Lysanders flying overhead and looking at them parked on the County Cricket Ground where Westland Engineers are at the end of West Hendford. My brother was an apprentice at Westland's, he made control columns for Lysanders in a small workshop."

Into service

The Lysander entered RAF service with No.16 Squadron in June 1938. 30th Entry Halton 'Brat' Bob Norris⁵ had his first posting to No 4 Army Co-Operation Squadron, then at RAF Odham. In 1938-9, the Squadron's Hawker Hectors were replaced with Lysanders; "joy of joy! – away with the hand starting handles – these new kites had electric starters."

The remarkable performance of the Lysander in its early service career caused some pilots to believe it was foolproof, but in the arena of slow, low flying there is rarely enough height available to recover from problems. Harald Penrose's concerns were to become all too real. On April 28th 1939, Lysander L4702 of No.2 Squadron at Hawkinge was demonstrating its slow flying abilities when the pilot took the aircraft up into a steep climbing turn, and the aircraft stalled. The two crew were killed. On the same day, a 13 Squadron Lysander, L4762, on a navigational exercise near Denham, made a steep climb after take off and stalled in a turn; again, the pilot was killed. The Air Ministry requested A&AEE Martlesham Heath to investigate, and orders were sent out that the Lysander was not to be put into a steep climb at under 500 ft and not to climb at all under 50mph IAS. Sadly, a month later, on May 20th during a public demonstration at Ringway, Lysander L4784 crashed while demonstrating slow flying at a height of 200 ft. This is not to imply that the pilots were stupid or careless, but that like the other RAF expansion period types, the pilots were having to learn the tricks of more highly powered and demanding aircraft at the same time as the air force grappled with sudden growth and change. Throughout the war there are records of Lysanders crashing as a result of slow flying activities. The pilot's notes are very clear about the risks of entering a stall at low altitudes, and modern operators of the type, such as the Shuttleworth Collection, are careful not to enter this corner of the performance envelope.

One of the early Lysanders, L4675, was manufactured with dual controls, and was sent to 16 Squadron (after going to CFS Upavon in error) but, in this

*An early production example showing the camouflage scheme very clearly in the low sun.
Aviation Photo News.*





Two photographs of Lysanders from 16 Sqn operating from their home base of Old Sarum, Wiltshire with the pre-war oversize codes and toned-down fuselage roundels. Note too that the serial numbers have been obliterated. 'Y' has been identified as L4801.

Aviation Photo News.

period of RAF culture, type trainers were simply not regarded as useful, despite the accident rate.

During the 1939 air defence exercises in the UK, No.16 Squadron's Lysanders acted as fighters, even to the extent of wearing fighter camouflage.⁶ Meanwhile, the home squadrons had their Lysander Mk.Is replaced with Mk.IIIs, and the Mk.IIs were shipped to the Middle East.

Later Lysander pilot Peter Vaughan-Fowler said: "As a 'wartime wonder' Army Co-op trained pilot, I always admired those pilots who could produce a perfect 'vertical line overlap' set of photographs, direct a battery of artillery using a Morse Key and fly the aircraft without getting lost in the process."



What was not revealed at this time was the lack of connection between the RAF and the army. Nigel Evans stated: "The necessary pilot training for arty/R does not seem to have been a high priority in the RAF."

Technical problems were another overlooked issue: "... RAF aircraft had VHF wireless with frequencies around 110 MHz while army wireless were HF operating below 10 MHz. The solution to this problem was to provide all artillery regiments with at least one VHF receiver with RAF operators."⁷

Footnotes

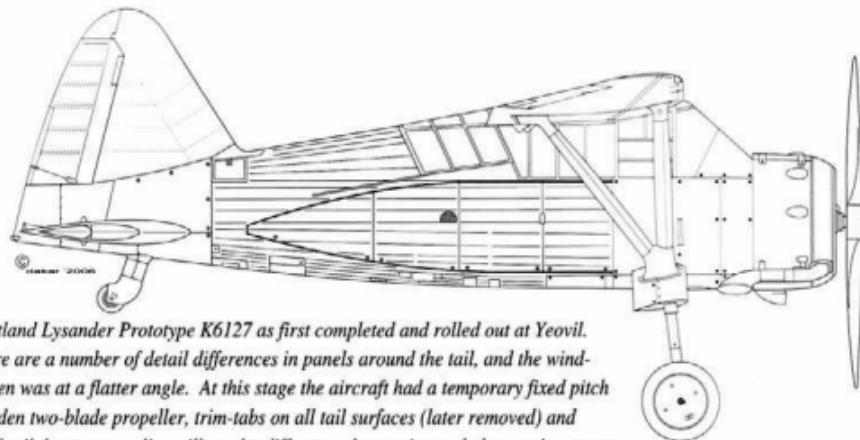
1. James, *Westland Aircraft since 1915*
2. A&AEE Report on K-6128 PRO Avia 18/637
3. James, *Westland Aircraft since 1915*
4. BBC People's War website. A3193201
5. BBC People's War website. A2358038
6. Bowyer, *Air Pictorial*.
7. Evans, *British Artillery In World War 2*

Left: A film still of HM King George VI touring the Westland works, 1940. British Pathe/ITV.

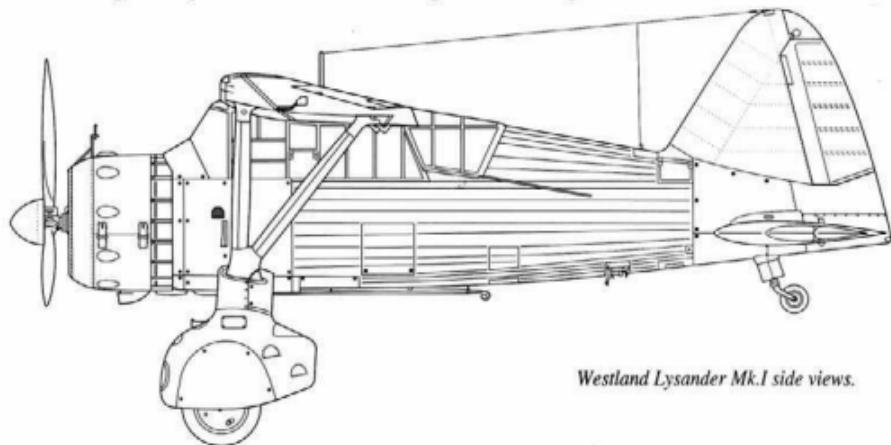


Below: Lysander L4709 on an airfield 'somewhere in England' clearly showing off the pre-war camouflage and marking scheme. Interestingly the aircraft in the background are Fleet Air Arm Fairey Swordfish. RAAF Museum.

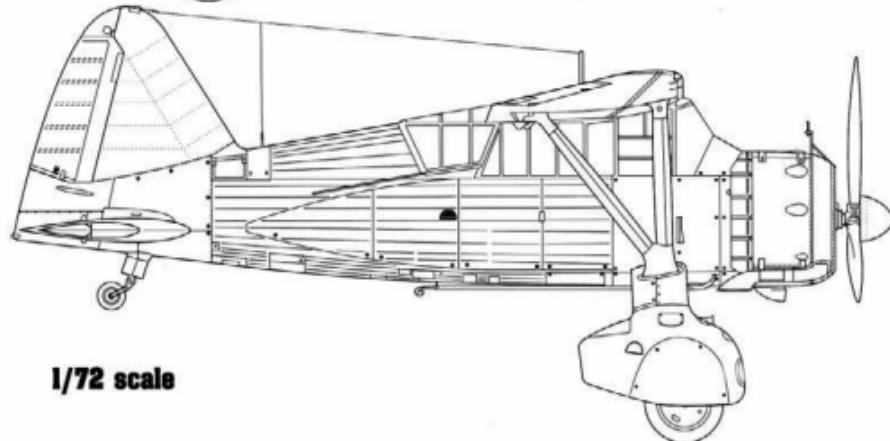




Westland Lysander Prototype K6127 as first completed and rolled out at Yeovil. There are a number of detail differences in panels around the tail, and the windscreen was at a flatter angle. At this stage the aircraft had a temporary fixed pitch wooden two-blade propeller, trim-tabs on all tail surfaces (later removed) and fixed tailplane, no cowling gills and a different exhaust pipe and observer's canopy. The undercarriage has a spatted tailwheel and is awaiting the mainwheel spats.

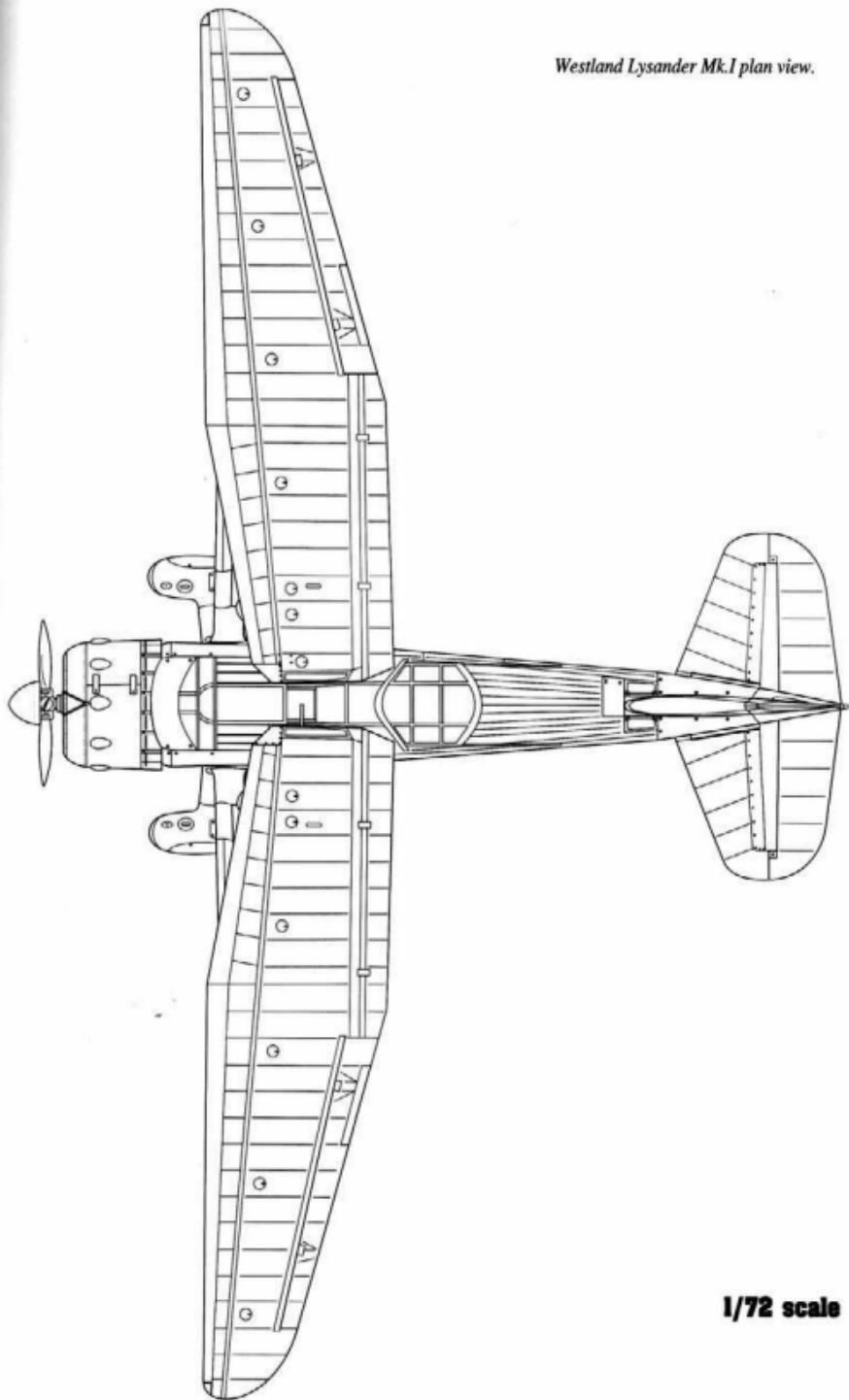


Westland Lysander Mk.I side views.



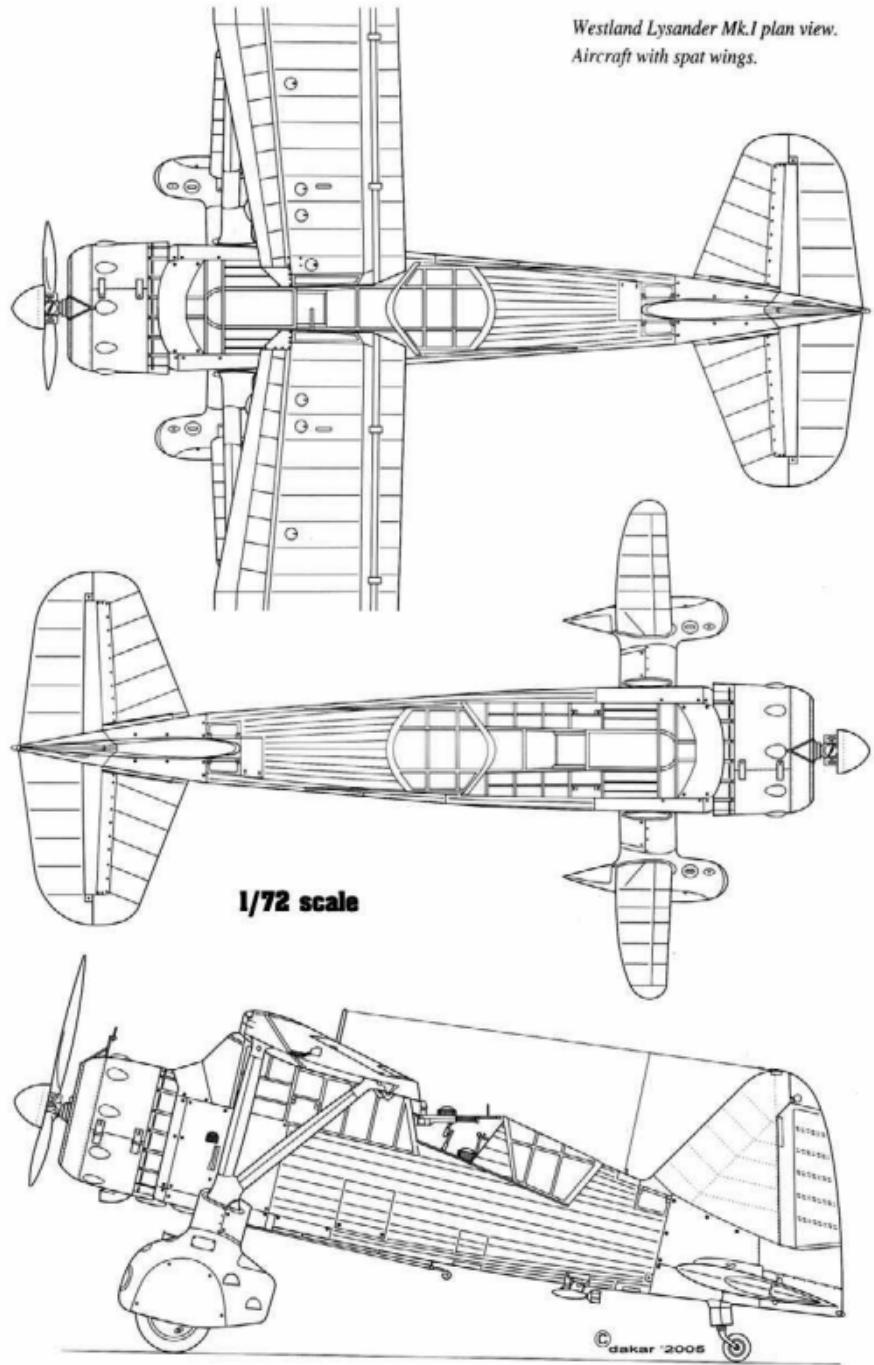
1/72 scale

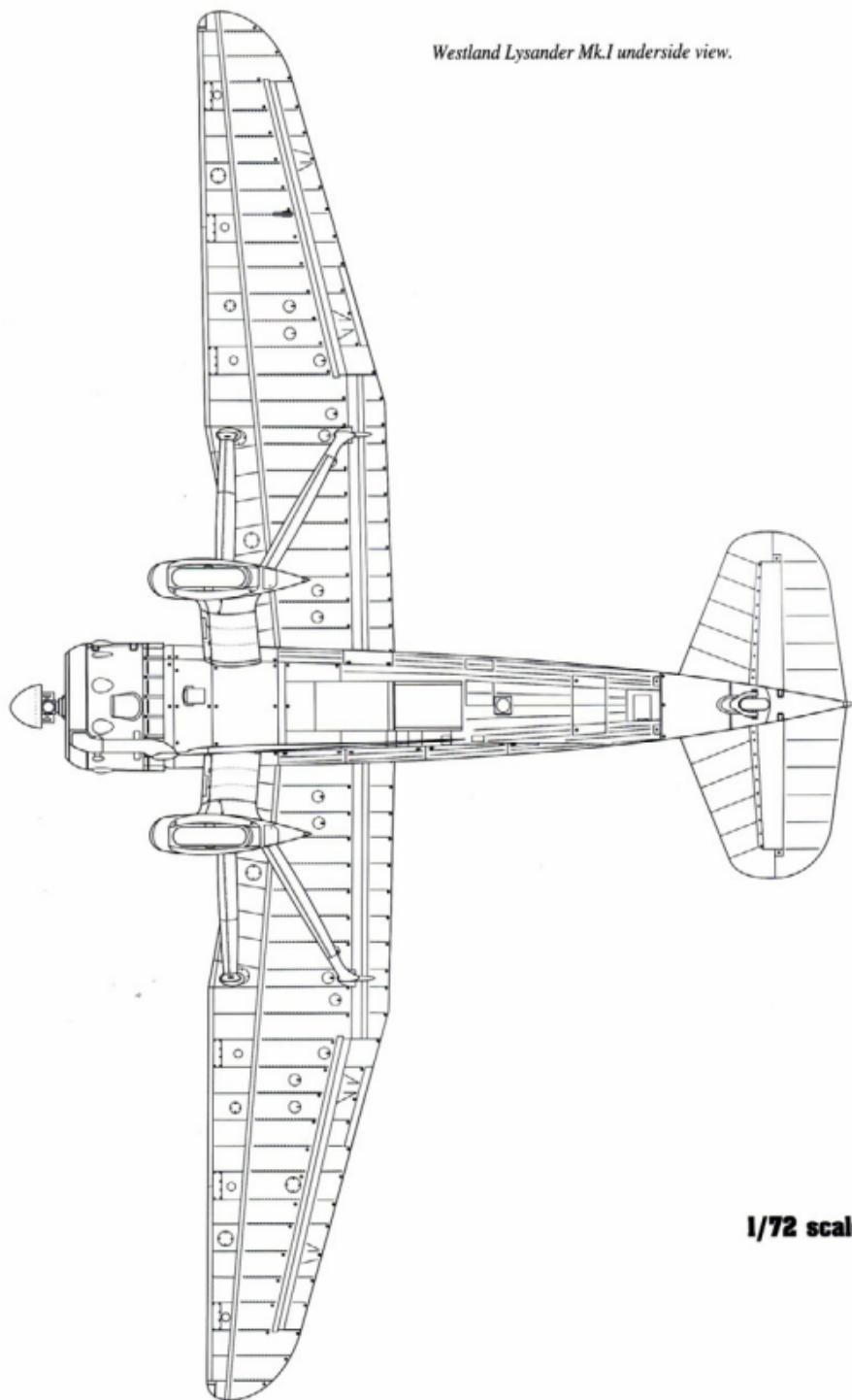
Westland Lysander Mk.I plan view.



1/72 scale

*Westland Lysander Mk.I plan view.
Aircraft with spat wings.*

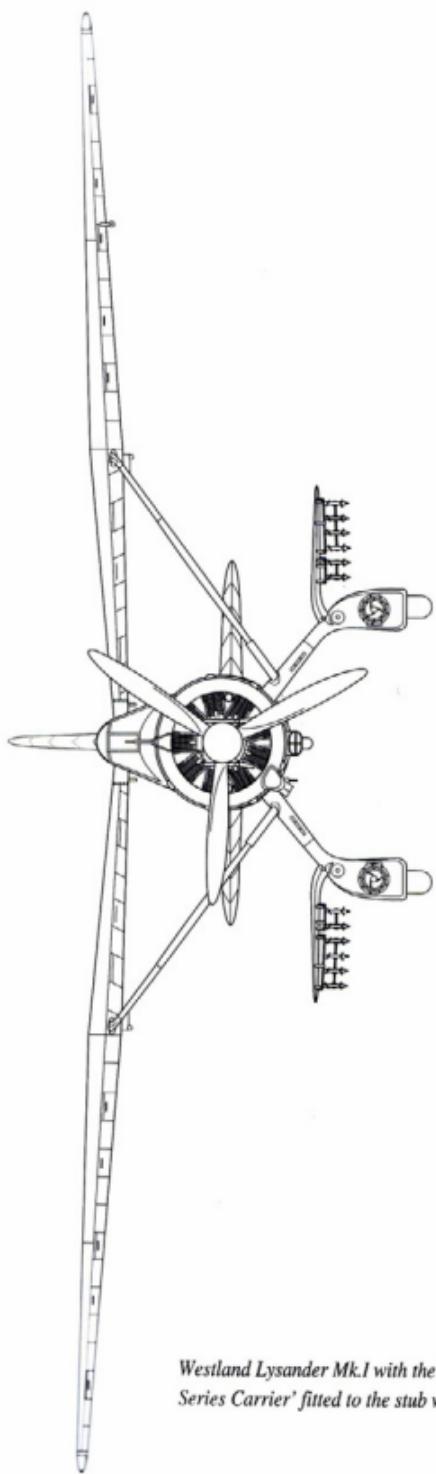




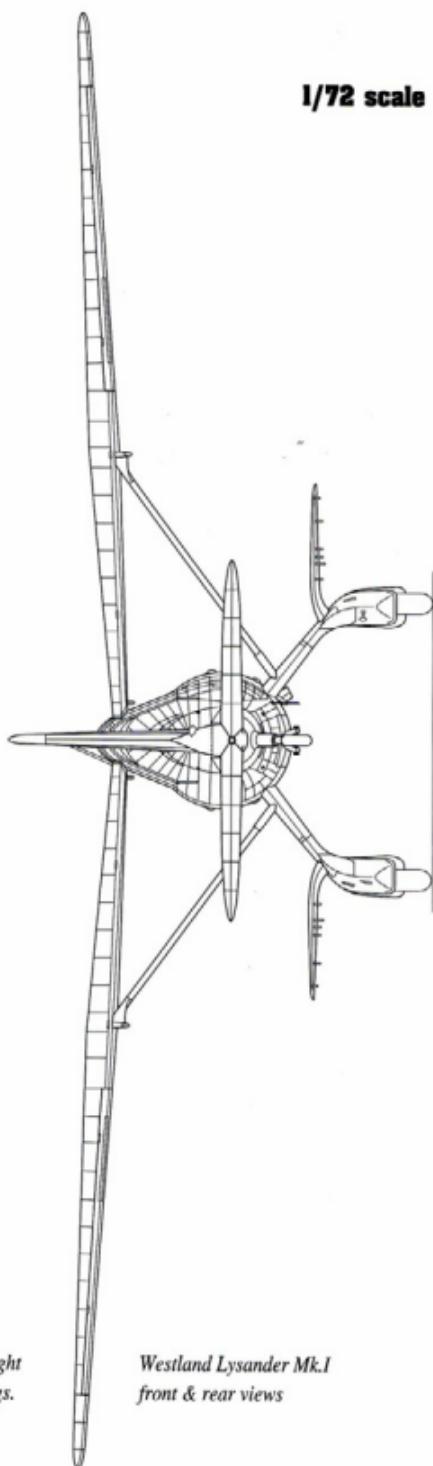
Westland Lysander Mk.I underside view.

1/72 scale

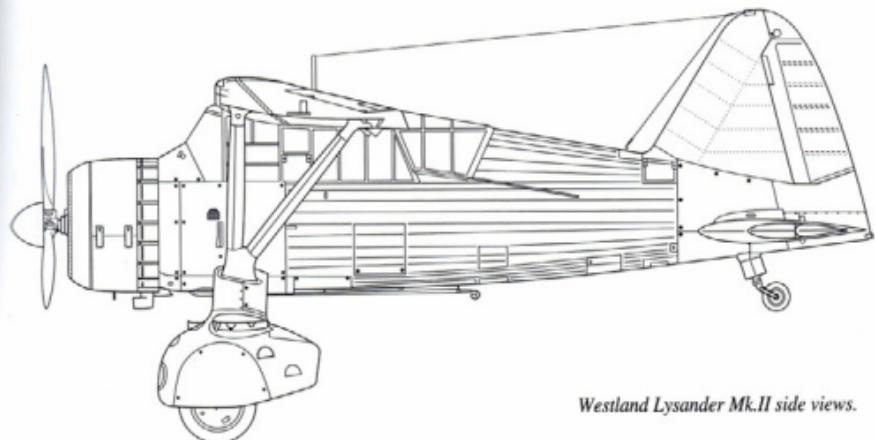
1/72 scale



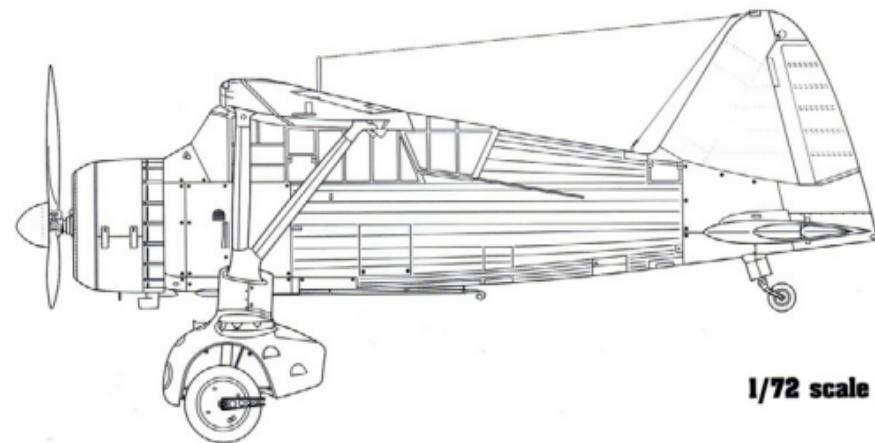
Westland Lysander Mk.I with the 'Light Series Carrier' fitted to the stub wings.



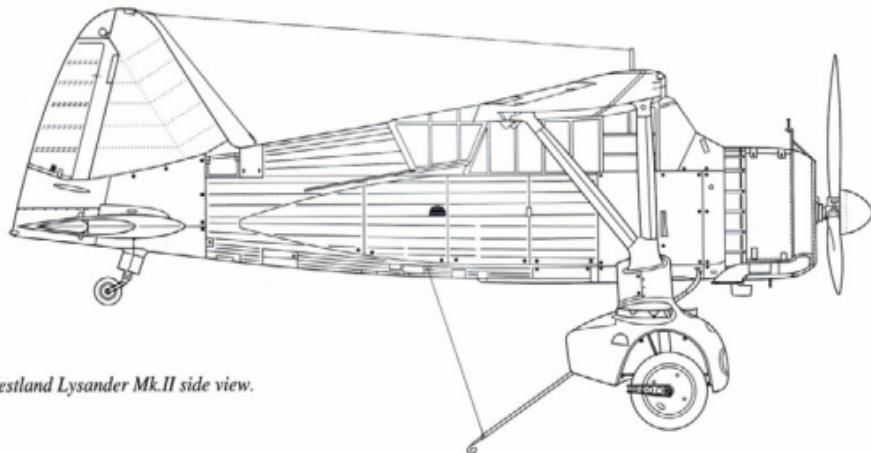
*Westland Lysander Mk.I
front & rear views*



Westland Lysander Mk.II side views.



1/72 scale



Westland Lysander Mk.II side view.

War

On September 2nd, 1940, a day before the British declaration of war and only a day after the German attack on Poland, four Squadrons of Lysanders were dispatched to France as part of the British Expeditionary Force (BEF).

The shock of the Blitzkrieg in its effect on the western European armies, on the 10th of May 1940, is well known today, and thus easy to underestimate. The belief that the 'Sitzkrieg' would develop into a replica of the Great War was reasonable, and the Lysander crews must have been expecting arduous and dangerous work like their comrades in the RE-8 and BE-2 'Art obs' aircraft. It is often forgotten that the western allies had seriously underestimated both the quality of the German equipment and the experience that the Germans had accrued.

France

On the outbreak of war, six of the seven Lysander squadrons in service were in France with the British forces. No.16 Squadron remained at Old Sarum, while





2, 4, 13, 26, 613 and 614 Squadrons were in France, equipped for the most part with Mk.II Lysanders. 613 and 614 Squadrons were, of course, Auxiliary Air Force units, and their aircrew were to acquit themselves with great honour despite their relative inexperience compared to the regular units. No operational flights were made in 1939, although a good deal of training and the preparation of photo mosaics of the front was accomplished. This was monotonous and fiddly work in one of the coldest winters of the decade. The mud of the autumn followed by the snow of winter forced the removal of the spat side covers - which generally stayed off from then on.

In the sudden rush of the May 1940 Blitzkrieg hundreds of aircraft were caught on the ground by the enemy. This Lysander shares the fate of so many others. Note the unusual fin flash, which appears to cover the whole fin. Stratus coll.

George Barker¹ served with No 26 (AC) Squadron:

"In 1939 I was a regular corporal fitter-rigger in 26 (AC) Squadron at RAF Catterick in Yorkshire, equipped with 18 Lysanders. By July we were on call, ready to be sent wherever the army went, and were restricted to keep within 7 miles of the aerodrome. In October we were posted to Abbeville. The Squadron carried out surveillance and photographic duties during the so-called phoney war. We moved to Dieppe for a while and then, presumably in conjunction with the Army's unsuccessful advance in Spring, we found ourselves in a field near the Belgian border."

In the 'Phoney War' Peter Dawbarn² was a young airman with an army co-operation squadron. His introduction to war was salutary:

"The first German I remember seeing was one day when we landed at this field, and there were two of our Lysanders on the circuit. Suddenly, out of the blue came two Messerschmitt 109s and shot them both down - that was the first thing we'd ever seen. We all stood there and gaped. They could have killed us all if they'd thought; but as soon as they'd shot the Lysanders down off they went. We were just standing there gaping at them - we were just kids."

Aircraftsman First class Bob Norris³ of No.4 (AC) Squadron recalled:

"We soon settled into the daily routine of TLC that the aircraft and aircrew expected, with the added bonus of an offer to the ground crew of 3d (just over



A famous photograph of a 13 Sqn Lysander Mk.II having a flat tyre repaired on a snow-laden winter airfield in France. There has been much confusion over the painted-out serial number of the aircraft having been misread as a retouching on the photograph by the wartime censor in some previous books. IWM

1p) a day and quick promotion to Sergeant to act as air gunners as the squadron only had three on the strength. This was where our first casualty came from. A victim of what is now known as "friendly fire", as the French gunners took delight in using any aircraft in their sights as practice targets but had failed to realise that the previous crew had loaded the guns."

Losses were heavy in the sudden shock of the German attack. Desperate measures were required, and sixteen Lysanders of 16 Squadron were sent from their reserve role, to attack a convoy near Cambrai - not a normal Lysander duty at all. By nightfall on May 15th, the British Air Forces France had lost nine Lysanders to various causes in anti-Blitzkrieg operations. A Lysander was the second kill of ace Oberfeldwebel Johann Schmid of JG 2 on May 18th 1940. A Lysander of 16 Squadron fell to Staffelkapitän Wilhelm Balthazar of 1/JG 1 on May 19th 1940 at 13:50 hours near Amiens. But it was not all one sided, as a 4 Squadron Lysander was attacked by six Messerschmitt Bf110s at low level - not only did they manage to evade the Bf110s, the gunner LAC Gillham managed to claim one Messerschmitt shot down. 16 Squadron downed the German equivalent, a Hs126, on May 18th by the crew of L4086: observer Corporal Barlow and Flying Officer D Weston Burt. On the same day, Lysander L4793 flown by Pilot Officer PG Dexter and Aircraftsman Webb was in a long fight with Bf109s near Arras and claimed at least one shot down. Not all 'friendly fire' was accidental. One soldier⁴ remembers that his unit was suspicious that the German gunfire increased when a particular Lysander flew over and they decided "...that it looked as if it were being used as a spotting plane by the Germans. He reported his suspicions to a senior British officer and was told to deal with it as he felt fit. It was decided that the next time the plane flew over

and the shelling started, they would fire close to it to chase it off, just in case it was really British." One hopes their aim was as shaky as their logic!

When the German attack fell, George Baker⁵ was at the 26 Squadron airfield:

"One day I had seen off an early morning sortie and was about to go back to my tent for a little more 'kip', when several Lysanders from another squadron landed. Their airfield had been taken by the advancing Germans and casualties had been heavy. Our squadron took off to try to harass the enemy with anti-personnel bombs and .303 bullets, and we bayoneted our petrol tins and started our retreat towards our rendezvous at Folkestone aerodrome.

Luckily the French authorities kept the 'N' roads clear for us and sent the poor refugees on slow roads, and the route of the enemy, although parallel to ours, did not converge with it. We were ground strafed rather inaccurately without any losses. We drove on to a ferry boat not long before the port was bombed, and got to Folkestone just a few days after most of our Lysanders got there. We found them to be perforated all over with bullet holes. We were relieved of our small arms, being out of a combat area. My friend, who was a fitter-air gunner, was shot down. He got back a week later after a rather hazardous journey, with some shrapnel in his back."

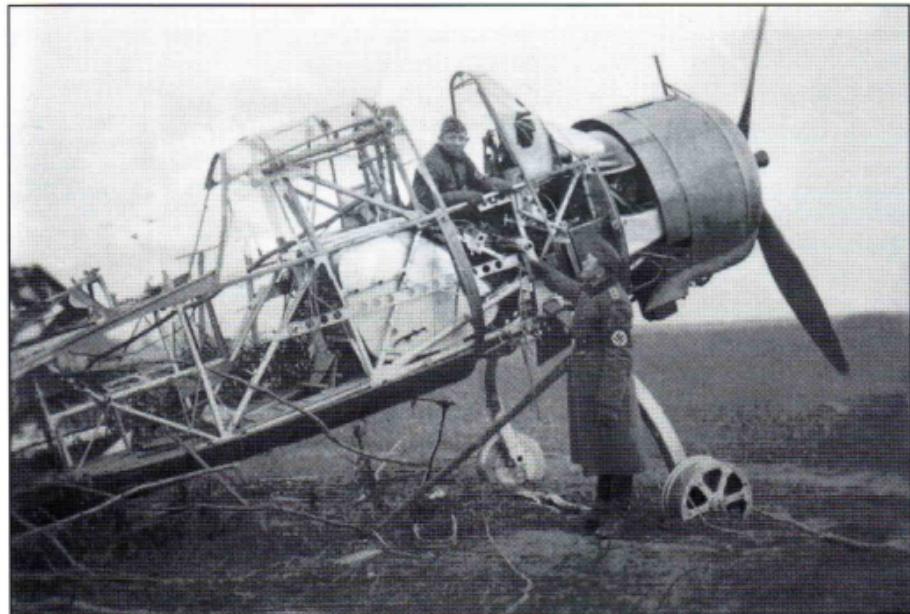
The Lysander was expected to provide, in the hackneyed phrase, "eyes for the army". However, they were unable to do their job: communications were wrecked, they needed fighter cover, and the front was too fluid to reconnoitre as planned. Their tasks would have been perfectly possible had there been some parity of fighter units, or some air superiority, but the restricted probings of the phoney war were replaced by total domination of the air by the Luftwaffe. It is often stated that the Lysander was completely outclassed like all the Allied



$11 \frac{1}{2}$ lb smoke bomb

1/72 scale

*A wrecked Lysander Mk.II provides a photo-opportunity for a couple of German soldiers. The remarkable size and position of the main fuel tank is clearly visible.
Stratus coll.*





Two photographs of Lysander Mk.II R1998 on exercises while allocated to 225 Sqn. The fin flash is unusual, as is the wavy lower demarcation line of the upper camouflage pattern due to the newly applied fuselage under surface 'Sky' colour, the upper camouflage colour previously wrapping around. IWM.





The pilot of another 225 Sqn aircraft jumps from the aircraft's seat. This aircraft differs from those on page 28 by the absence of the wheel covers (revealing the detail of the mud scraper) and the different position of the fuselage roundel. IWM. The lower photograph shows a different machine almost completely obscuring another Lysander behind. Note that these machines now have 'sky' under wing camouflage, rather than the previous 'aluminium' black or white. IWM.

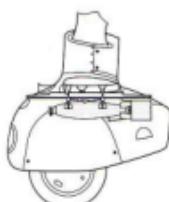




A popular trick for the press, almost completely redundant by the Second World War, was using the message-hook to pick-up a note from the ground forces. Note the laid out 'M' that the aircraft is passing over. Also of interest is the yellow marking on the spat. IWM

forces, and the losses sustained were certainly unacceptable. This is true, but the Henschel Hs 126, an aircraft of almost identical performance and layout to the Lysander, was able to fulfil its job and did very well despite higher losses than in previous Blitzkrieg campaigns. (Although it is worth noting that at least two Hs 126s were shot down by Lysanders on May 18th and 22nd.) The Commander in Chief of British Air Forces France, Air Marshall 'Ugly' Barratt, wrote finis to the role: "The Lysander was quite unsuited to its task; a faster less vulnerable aircraft was required. More-over the Lysander tied up a high proportion of fighters as escorts."¹⁶ So the Lysanders were withdrawn to Britain, after fifty had been shot down and thirty lost to other causes in the Battle of France. (Although quoted numbers vary significantly.)

Aircraftsman First Class Bob Norris⁷ of No.4 Squadron remembers a moment's pedantry: "Our surviving aircraft caught up with us having made landfall at Lympne airport and paying the landing fees that the airport staff insisted on. The bill was later displayed in the mess."



120 lb GP bomb on
universal No.1 carrier
1/72 scale

Calais

Calais was perhaps the Lysander's finest front-line hour. A hard pressed British garrison was fighting a rearguard action with no hope of rescue and tying up two German divisions, enabling the development of the rescue of the BEF from Dunkirk, further down the coast. The Lysanders of 613 Squadron were first used as light bombers, as this report by Flight Lieutenant Walker (with observer Pilot Officer Lambton) makes clear:

"Operations Officer Air Component ordered six Lysander aircraft of which I was flight leader to take off at 1830 hours [On May 25th, 1940] to carry out dive bombing attacks on enemy gun positions. An accurate pinpoint was given

and the flight took off at 1830 hours in open line astern. Cape Gris Nez was sighted at 1840 hours and the flight wheeled S.E. crossing the coast at St Rouanne. Heavy Bofors type A.A. fire and tracer opened up on crossing the coast. The target was located with some difficulty owing to successful camouflage. I dropped bombs in salvos (two 250lb instantaneous fuse) and made off in some haste for the coast looking behind to see the result, unfortunately smoke and earth had completely blotted out the target. All pilots dropped their bombs in the near vicinity of the target but admitted that owing to the smoke etc caused by the previous bombs explosions found it difficult to specify whether or not they had received a hit. One faulty release caused a bomb to be dropped on land near Dover.

All aircraft returned without casualties. My own aircraft was damaged by a small shell causing holes to be ripped in wing and fuselage near petrol tank."

The pilot of the aircraft with the hung up bomb (a Flying Officer Walker with Corporal Patterson as observer) reported:

"...I was the fifth to attack and released my bombs at about 2,000'. The starboard bomb failed to drop. While recrossing the Channel I made every effort to get rid of it trying all switches again, I noticed the jettison lamp was flickering, but it did not go. I left the fusing switches nose and tail safe, but while making a wide circuit of Hawkinge aerodrome (clear of houses) my airgunner drew my attention to the fact that it had fallen and exploded in a field. I landed at Hawkinge and reported the matter to the armament Squadron Leader."

The report a couple of days later by Squadron Leader J F Anderson of 613 Squadron, who was accompanied by Pilot Officer Wesson on their operation to Calais on the May 27th 1940, makes interesting reading. It followed another operation at 04:45am to drop water to the beleaguered garrison, which had been very successful with 70 - 80% of the containers landing on the mole and in the shallows on the Allied side. At 09:40:

"Six Hector aircraft [also of 613 Squadron] took off, loaded with 2 x 120lb bombs each, formed Echelon left 50ft intervals and escorted 6 Lysanders with supply containers. These Lysanders were in line astern at about 100ft interval, and on the right of the Hector formation. On arrival at the target the Hector aircraft carried out one run at 400ft from N. to S. dropping one bomb each, and engaged all A.A. and infantry targets seen with front and rear machine gun fire: aircraft carried out a return run individually to cover supply dropping action by Lysanders.

Hector aircraft then returned individually and covered withdrawal of Lysanders by means of low flying attacks with machine guns. 3 ground A.A. enemy M.G. posts were seen to cease fire after being attacked; two bombs were seen to fall within 20 - 50 yards of a fourth gun position. Other bombs were seen to fall in woods and built up areas round the British infantry position.



No photographs seem to have survived of the Calais operations, but early wartime publicity led Westland's to commission a painting showing a version of the action. The text reads: 'Squadrons of Westland Lysanders, flying with great daring, added to the epics of the defence of Calais by dropping water, ammunition and hand grenades to the heroic garrison of Allied troops and marines. As they passed over the Citadel the pilots came down to as low as 50 ft. to make sure of their aim'.

One Hector aircraft K8116, P/O Jenkyns and LAC Brown was met over the channel on the return journey. Aircraft was damaged in two places from A.A. (Bofors) fire, petrol streaming out. This aircraft turned away and disappeared in fog on Dover cliffs and did not re-appear. All other aircraft of the Squadron returned safely."

A note followed from Wing Commander Bertram: "I wish to inform [the] Air Officer Commanding of the terrifically fine show that had been [put] up by 613 Squadron[sic]. Not only was it well organised but extremely efficiently carried out. It has proved more than useful, they have dropped everything in the right place and all at Hawkinge were very much impressed at their efficiency."*

Only one container had fallen into the hands of the enemy. By the time the Calais support operations had finished, 2, 16, 26 and 613 Squadrons had all been involved and had lost more than 30 Lysanders and many of their crews.

The Home Front

After the fall of France the expected invasion had everybody to the ramparts of the British Isles. Coastal patrols of Lysanders were treated as operational sorties, and the aircraft carried bombs (including the rear fuselage racks) and ammunition. Lysanders were on dawn and dusk patrol looking out for invasion forces from Duncansby Head in Scotland right around the British coast to the Wirral in Cheshire.

On Ireland a bizarre situation arose: the British were concerned that the Germans might invade neutral Eire or British Northern Ireland. 231 Squadron was formed from 416 Flight in July 1940 to liaise with the British troops in Northern Ireland. On the other side of the border, the independent Eire government were also worried about potential German attacks or, indeed, a pre-emptive British invasion to prevent a German landing on the island. As a result the Irish Air Corps, equipped with Gladiators and Lysanders, were keeping a wary eye on the coast and their northern border. Luckily, efforts at co-ordination and understanding prevented potential accidents, or indeed a Lysander battle.

Three Polish airmen in front of their Lysander. SM&PI.





*Lysanders Mk III of 309 (Polish) Squadron, Renfrew, early 1941. Note lack of the Squadron code letters.
SM&PI*



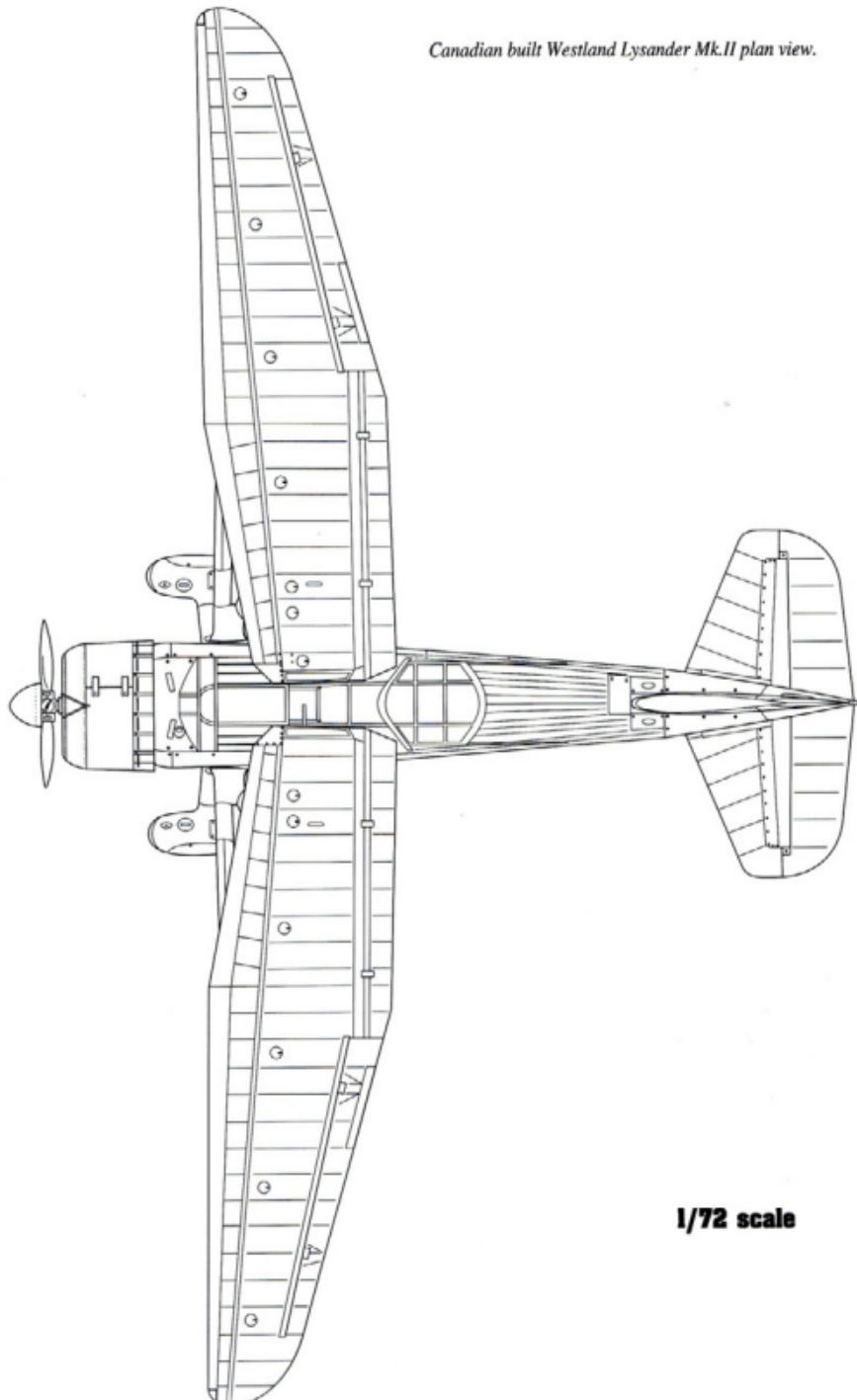


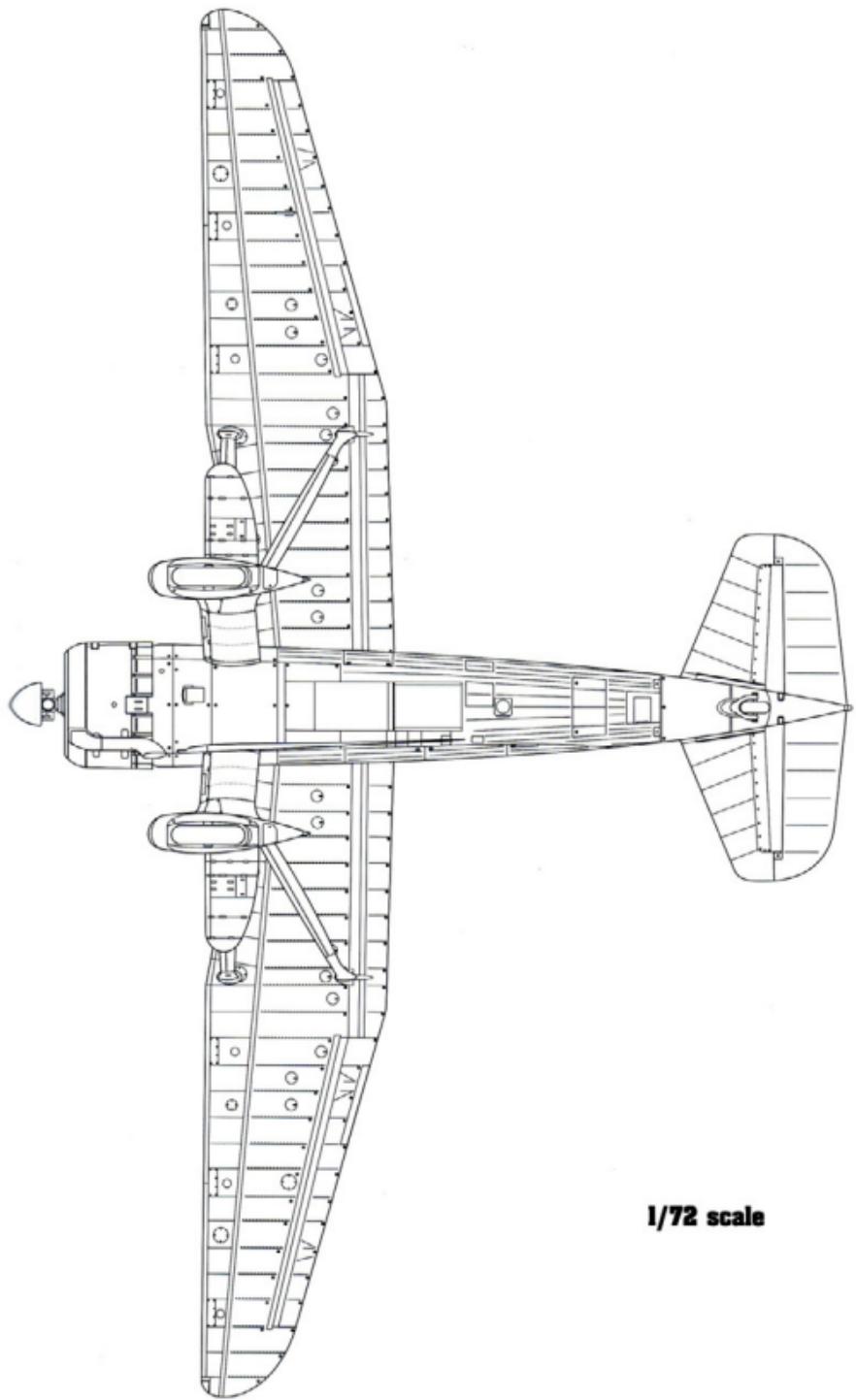
Above: Lysander Mk III of 309 Squadron, early 1941. SM&PI.

Lower and opposite: Lysander Mk.IIIA of 416 Flight (or 231 Sqn) over Newtownards and the coast in Northern Ireland, showing a British presence during the darkest period of 1940. The photo top right is intriguing as it shows patching and repainting on the upper wing, as well as a gas detector patch on the horizontal tail-plane and with the late style aerials on the wings. The stub-plane tips appear to have been repainted as well. Via Tony Osbourne. (Far right) Another Westland wartime publicity poster showing a very pastoral scene.









1/72 scale

North Africa & Greece

It had been hoped that North Africa and the Middle East would be a quiet area of the world, but Commonwealth forces were to be even more stretched as a result of Mussolini's ambitions. The British and Dominion forces available to Air Vice Marshal Longmore in North Africa featured three Army co-operation squadrons of Lysanders, 3 Sqn (RAAF, with a flight of Lysanders) and 6 Sqn and 208 Sqn RAF.

While the Germans were cutting through Western Europe, an exercise was carried out in Egypt by the RAF, involving a flag-showing flypast of 72 Blenheims, 63 Gladiators, 10 Sunderlands and 21 Lysanders. The Lysanders were from Nos 208 and 6 Squadrons. This show of strength did not deter the Italians in Libya, and Mussolini declared war June 10th 1940.

Between the 15th and 30th of November 1940 the Lysanders, accompanied by Blenheims and heavily escorted by available fighters, provided General O'Connor with complete coverage of the Italian front line south of Sidi Barrani. But again the Army co-operation aircraft could not undertake their tasks without fighter escorts. It also became evident that the robust Lysander undercarriage was not able to cope with desert conditions, being too inflexible and suffering from burst tyres and undercarriage collapses. As the Special Duties pilots were to find later in France, the undercarriage was tough, but when it hit a hard obstacle greater than it could surmount, it would not bend, but it might break.

On February 2nd 1941, while on a reconnaissance operation, Lysander N1206 of 237 (Rhodesian) Squadron was the instigator of a dogfight. Flying Officer M A Johnson saw and attacked a Caproni Ca133, which crashed over the Scipitole-Tole road.

"Unseen by Johnson three of the escorting CR42s from 412 Squadriglia dived down to attack. Johnson's gunner Sgt J G P Burl fired off several pans of ammunition at them and saw smoke emit from the engine of one of them. With the controls shot away the Lysander fell away to crash to the east of Tole. Both pilot and gunner were wounded in the attack."¹⁴

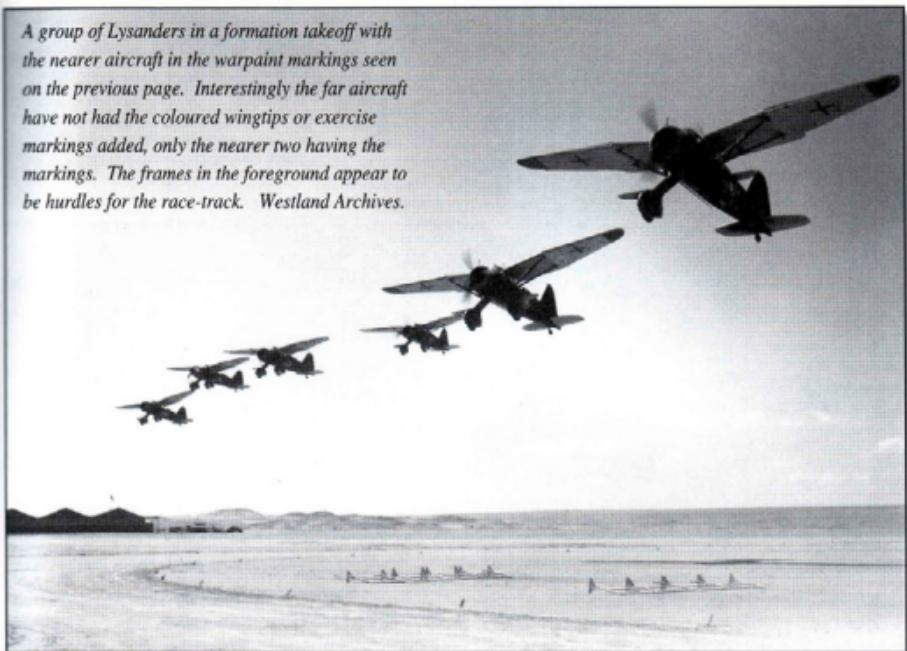
A Lysander of 208 Sqn equipped with Smoke

Curtain Installation (SCIs) for use during war games (possibly linked to the to the 1940 flypast) indicated by the painted wingtip and red (or blue) force underwing cross. Geoff Grierson via Don Clark & Mike Grierson.

This Lysander was in L4719 was one of two 208 Sqn machines at Larissa, piloted by F/O Waymark on 15/4/1941, to evacuate the two surviving members of 211 Sqn's disastrous Easter Sunday raid who had succeeded in regaining their own lines after being shot down. Both Lysanders were attacked by Messerschmitts shortly after taking off. P/O JW Stewart in L4690 with F/Sgt AG James as passenger was shot down almost at once: only Stewart survived. Waymark took F/O AC Godfrey as his passenger and rear gunner pro-tem. Under attack by five Me 109s, Godfrey retaliated with the VGO. Losing two fingers under fire, he continued to shoot with his left hand until the aircraft crashed. Now with an injured leg as well, Godfrey escaped the aircraft and subsequent ground strafing with Wymark's help.¹⁴



A group of Lysanders in a formation takeoff with the nearer aircraft in the warpaint markings seen on the previous page. Interestingly the far aircraft have not had the coloured wingtips or exercise markings added, only the nearer two having the markings. The frames in the foreground appear to be hurdles for the race-track. Westland Archives.



Over a month and a half later, on March 21st, another 237 Lysander, R1988, tangled with a bunch of CR.42s over their target, Keren. Flt Lt G A Smith and gunner Sgt A K Murreli DFM managed to see them off, Murreli claiming one damaged, although their aircraft was hit and Smith wounded.¹⁰

In April 1941, No.6 Squadron was detailed to support the isolated Tobruk garrison and they and No.73 Squadron managed to reconnoitre and counter the German land and air attacks, but by May 19th it was decided to fly out the four remaining Lysanders and the squadron's Miles Magister. Pilot Officer J E McFall managed to pack in a number of amazing operations, almost entirely illustrating the roles requested in the A39/34 Air Ministry specification for the Lysander. On April 9th he, with Corporal Copley as gunner, managed to shoot



L4710 undertakes its party piece of a message pickup for the press photographer, the loop of cord has just been snatched, and one of the posts is about to hit the ground. Though an obsolete technique, it is more likely that this form of communication may have been used in North Africa than elsewhere. This aircraft eventually crashed after undershooting a landing near Ciro in July 1942. Westland Archives.



Above: Lysander R1992 in North African colours is captured here when it was delivering Major General Ginbachan Singh to Indian troops for an official visit. IWM

Lower: With a flat tyre, it appears that this Lysander Mk.I of No.208 Sq. is trapped at the remote Siwa Oasis. FAA Museum.

down a Junkers Ju 52/3m while on a tactical reconnaissance; and on May 16th he landed alongside a gun Battery to arrange fire directions. Finally, on May 18th he flew the Brigade Major over the enemy positions, before joining the evacuation of the Tobruk air component.

Later, the Lysanders of 208 Squadron were transferred to the desperate and, as it turned out, hopeless Greek campaign in early 1941, at about the same time as the Germans arrived to support their Italian allies. The Lysanders moved forward just in time to join the retreat, and although they were to lose a number of Lysanders, crew casualties were remarkably light.

When sent for a rest at Wadi Halfa and Kufra Oasis, the Hurricane-equipped No.6 Squadron was re-equipped with six Lysanders (three Mk.I and three Mk.II) and eleven Gladiators, the Hurricanes being too valuable to spare from the front in 1941.



Lysanders faded into the background, but they were still to be found undertaking some unique jobs. Captain Jeffrey Hiltout¹¹ of the 1st Royal Tank Regiment was attached to a South African Spitfire Reconnaissance squadron station outside Rome;

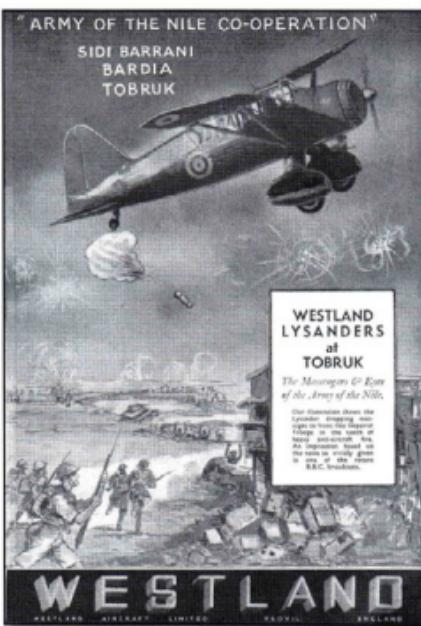
"One evening in April 1944 a Lysander swooped low over the airstrip and a package plummeted to the ground. One of the Spitfire pilots, returning to the mess after de-briefing, spotted the incident, ran onto the airstrip and recovered it. He found it had had a label attached to it, addressed to me.

I left the de-briefing room ten minutes later and the South African, who had been waiting for me in the mess, handed me the package. Mystified, I turned it over in my hands, my companions in the bar waiting impatiently for me to open it. I took off the outer wrapping and revealed a stone around which was a piece of paper secured by a rubber band. I opened the paper. From my wife in Alexandria, the message read: 'Congratulations. You are the father of a beautiful baby girl. She is, as we agreed, our Annie! Your loving wife.' It was wonderful news for me and it raised my morale enormously and I could not help reflecting that life goes on in spite of Hitler."

Palestine & Syria

A couple of Lysanders were brought to the British Mandate of Palestine in 1938 for evaluation by No.6 Squadron in the 'anti-terrorist' role, as a result of sectarian fighting. The pilots were favorably impressed, in contrast to their Hawker Hardys, but bigger events were to eclipse this future hotspot.

After the Germans completed their occupation of Greece, No.208 Squadron reformed at Gaza in Palestine, and detachments of Hurricanes and Lysanders



Above: Another fanciful painting for Westland's advertising shows some of the very real work the Lysanders did do in North Africa.

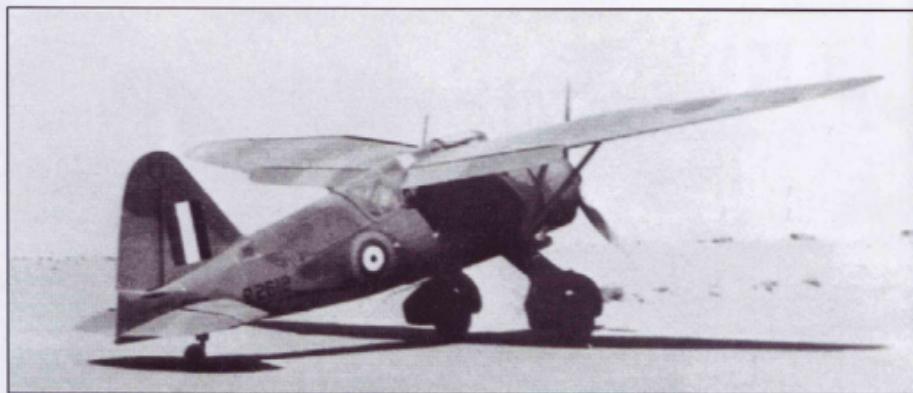
Below: A damaged Lysander R2612 probably used by No.3 Sqn RAAF missing its port wing 'somewhere in the desert'. RAAF Museum Archive.





Upper: Two photos of Lysander L4684 from a private album of photographs. This machine served with 16 and 208 Sqns before the SF Lydda, 71 OTU and finally Western Desert Communications Flight before being written off after a bad landing at Mersa Matruh in July 1942. RAAF Museum Archive

Lower: Lysander P2612 still with message hook fitted basks on a North African airfield. RAAF Museum Archive.





were sent to Habbaniya and Amman for use in the Allied invasion of Syria where the Lysanders carried out their original reconnaissance role. After the Syrian surrender on 14th July, the squadron returned to Gaza before recall to the Western Desert shortly before their Lysanders were phased out of service.

Madagascar

Tony Antoine¹² was with 1433 Flight RAF who took part in the invasion of Madagascar in 1942. Not much has been recorded about this operation, in which the British occupied the large Vichy French administered island to prevent Japanese use. 1433 Flight were specially formed at Wilmslow with 133 officers and men. As usual, they did not know where they were going, until they sailed out of Durban. They were equipped with Mk.IIIA Lysanders, and were intended to undertake photo-reconnaissance of the island, and also to be available for ground strafing if necessary. He recalled that there were also Fairy Fulmars from the Navy there. As usual, it seemed chaotic: "The only equipment we had was what the fitters carried with them. Nothing else. No guns, although

Top: Two airmen aboard a Lysander Mk.II somewhere in the featureless desert. Note the dust filter on the carburettor air intake, and the wrap-around camouflage under the fuselage.

RAAF Museum Archive.

Lower: A Lysander under recovery with the wings removed and the tail hitched aboard a truck. Note that the wheel covers and hub covers have both been removed. Time for a brew-up? Stratus coll.





SBC with 30 lb bombs



Port side profile of a Lysander Mk.II. Note the dust filter.

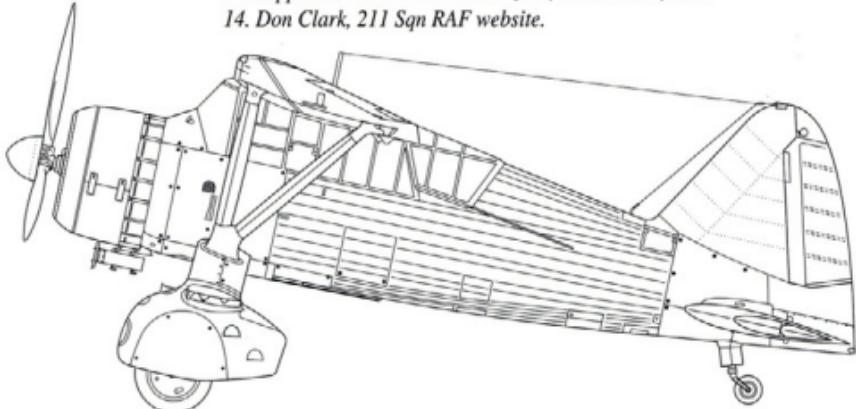
the Adjutant had a pistol but with no bullets. No pots or pans, tents - nothing. We had to build our own kitchen and barter with the natives for bananas and tomatoes. We got bread from the Navy bake house that they had got in town. We were finally issued with French carbines taken from Arrachart airdrome and given English .303 bullets which fitted them." Nevertheless, the landings and occupation was successful, involving 29 Lysander operations, strafing of resistance in the south and broken tailwheels leading to only two Lysanders remaining serviceable by the end of the campaign.

Andaman Islands

In an interesting note first published in the London Gazette in 1948, the building of an airstrip at Port Blair in the Adaman Islands was described. This strip "constructed with some difficulty" was only 800 yards long, and, as the Gazette reported; "The only type of reconnaissance aircraft available that could be operated from such a base was the Lysander and two of these aircraft were fitted with long range tanks and flown over escorted by Hudsons on the 11th February. These aircraft were able to carry out reconnaissance until the Andamans were evacuated."¹³

Footnotes

1. BBC People's War website. A1953678
2. BBC People's War website. A4295621
3. BBC People's War website. A2358038
4. BBC People's War website. A2801071
5. BBC People's War website. A1953678
6. Robertson, *Lysander Special*
7. BBC People's War website. A2358038
8. 613 ORB via Alex Crawford
9. 'Dust Clouds in the Middle East' by Chris Shores, via Alex Crawford.
10. 'Dust Clouds in the Middle East' by Chris Shores, via Alex Crawford.
11. BBC People's War website. A2055269
12. BBC People's War website. U805704
13. Supplement to the London Gazette, 11th March, 1948
14. Don Clark, 211 Sqn RAF website.



Foreign production & Service

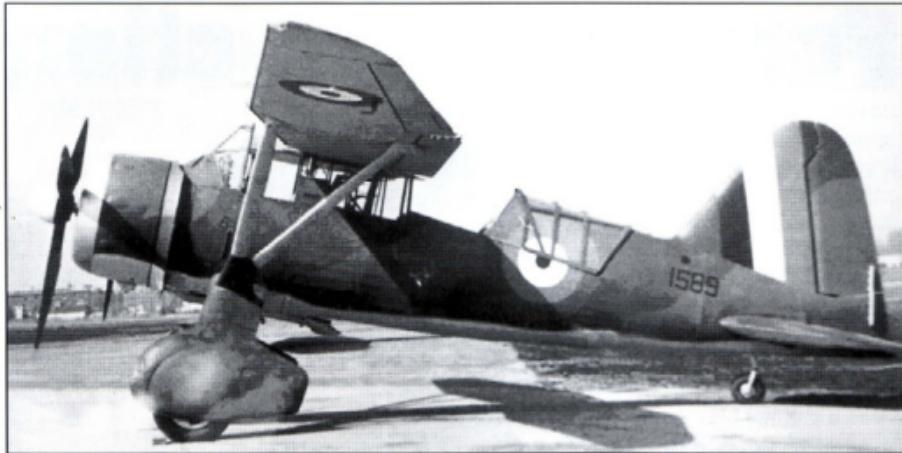
Given the Lysander's versatility, it was one of the types that were acceptable for foreign sales and service. The second prototype, Lysander K6128, was in fact dispatched to Karachi, India for what would now be called hot and high testing in March 1938. These trials with 5 Squadron, based at Miramshah in Waziristan, were successful, with the extra outcome that the Indian Air Force placed an order for Lysanders.

As regards the sale or loan of Lysanders, diplomatic needs were as important as Allied interests and foreign earnings. Two Lysanders were delivered to Egypt before the war, and more later. An order from the Estonian Air Force was overtaken by developments on the Eastern front and never delivered, and then a batch of nine of the aircraft intended for the Estonians were sold to the Finns when they were fighting the Russians. Diplomatic reasons prompted the delivery of several Mk.II Lysanders to Eire and even more naked political manoeuvring resulted in a batch being sent to Turkey to encourage the Turks to join the Allies. A further eight Mk.IIIIs were sent to Portugal as a payoff in part for the allies' forced use of the Maldives.

Like the Fairey Battle, the Westland Lysander was offered by the British to the Commonwealth air forces as a type suitable for production and use by Australia and Canada. Australia declined the Lysander, in favour of the North American NA.33 (built as the Wirraway). South Africa had a number of Lysanders shipped there to assist in training for the Empire Air Training Scheme.

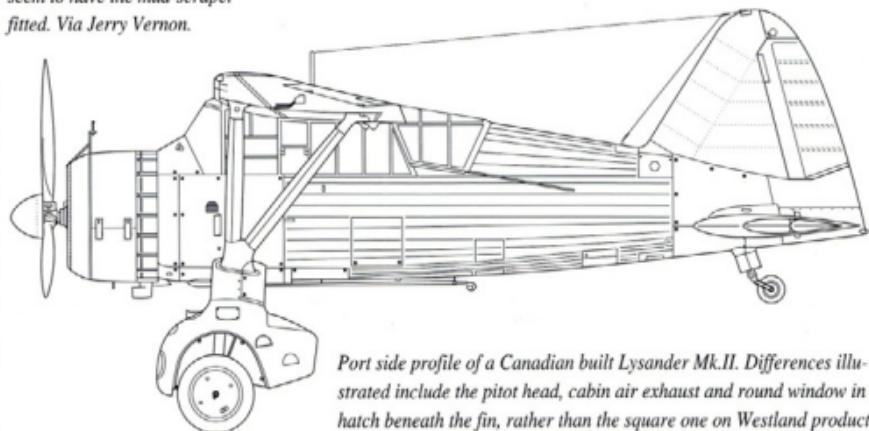
Three early production Canadian built Lysanders of 110 RCAF Sqn on a snow covered RCAF Rockliffe, in January 1940. The modified air vent under the cockpit is clearly visible on 416.





Top: A Canadian production Lysander, 1589. Note the different (later version) front edge to the observer's canopy compared to the photo below. MAP.

Middle: Canadian Lysander Mk.II 426 at Vancouver clearly showing the toned down Canadian colours they were painted in. The line of demarcation around the spat is soft-edged and distinctive and note that the Canadian operated Lysanders don't seem to have the mud-scrapers fitted. Via Jerry Vernon.



Port side profile of a Canadian built Lysander Mk.II. Differences illustrated include the pitot head, cabin air exhaust and round window in the hatch beneath the fin, rather than the square one on Westland production.



Top: Lots of detail in this photo taken circa the summer of 1943, an airman removes the camera from an RCAF Lysander, at RCAF Station St. John, Millidgeville airport, Saint John, N.B. Hart Collection, No.1283, Heritage Resources, St John, N.B.

Bottom: Three Canadian Lysander Mk.IIs 420, 487 and 479 photographed in formation on 07 April 1943. They were based at RCAF Station St. John, Millidgeville airport, N.B. No.1279 Hart collection, Heritage Resources, St John. N.B.



Test pilot E Leigh Capreol in the cockpit of the prototype National Steel Car Ltd Lysander in August 1939 at Malton, Ontario after the successful first flight. E L Capreol Collection, National Archives of Canada PA-124189.



Canada

Canada had a bigger economy and what proved to be a much greater war capacity, and was able to scale up war production quickly. In April of 1938, a contract for 28 (later raised to 75) Lysander Mk.I was placed with the National Steel Car Corporation of Hamilton, Ontario, with Mercury and Perseus engines to be supplied from Britain. This held up production and ran a risk of loss of the engines at sea from U-Boats. One Lysander was sent from the UK as a pattern aircraft. The British also contracted for 150 Canadian-built Lysanders for shipping to the UK, but this order was later cancelled. The specification was changed from Mercury to Perseus engines, making the initial production batch Mk.II Lysanders. The machines were essentially the same as the Westland-built machines, although the National Steel Car Corporation were able to make larger panels with their presses (including the wing leading edge sections) and the undercarriage 'U' beam was of a composite construction, as Canada did not have the facility to heat treat such a large item at that time¹.

The first Canadian example was No.416 and it joined the RCAF on September 7th 1939. Its first flight, to the great and justifiable pride of the workforce, as it was the first aircraft that they had produced, was on 16th August, in the hands of E L Capreol.

Quickly, the Canadians discovered what needed to be changed about the Lysander. Most British references say that the Canadians fitted additional heating as the cockpit was cold and draughty; in fact it seems that the oil coolers, designed to act as cockpit heaters, were giving off excess heat in summer, and in the cold of winter the oil was bypassing the un-required cooler almost completely, resulting in no heating at all for the crew! To solve the problem of inadequate heating and excessive ventilation, the Canadians added a 'muff' to the exhaust collector ring at the front of the engine cowling. On the Mercury engine it was on the inside, and thus not obvious: on the Perseus it was on the outside lower port quarter, and appeared as a couple of bulges with vents. Later Mk.III Lysanders had a long exhaust with an intensifier tube fitted to help with



the heating. The Canadian canopy was also modified to stop draughts. Some Mercury engines on Bollingbrokes (the Canadian-built Blenheim Mk.IV) had a similar but different heater arrangement on the engines, sometimes distinguishable by three circular intakes at the front top inside the collector ring. At least one restored British Lysander was equipped with the Bollingbroke heater setup for a while, causing some confusion to researchers!

One RCAF Lysander unit came to the UK early on. No 110 RCAF Army Co-Op Squadron sailed to Britain from Halifax, Nova Scotia on February 14th 1940, and were based at Old Sarum, being loaned Lysanders from RAF stock.

Bruce Robertson recalled that: "Local people can still remember being startled by shouts of 'Hi-ya!' coming from above. Looking up, they would see figures hanging outside Lysanders. Apparently some Canadians took to the air in Lysanders standing on the stub wings, lashed to a wing strut, wearing flying overalls and goggles and relying on the pilot to keep to the lower speed levels."²



Lysander Mk.II 459 fitted with Canadian designed and produced skis fixed to the axles within the spats; a clean and effective modification. Note the ropes to tether the aircraft – On ice, the aircraft could very easily be blown away! Notes indicate that handling in the air was good, but 'not satisfactory' on the ice and snow¹⁰
Rockcliffe, Ontario, March 12, 1942. National Archives of Canada PA-064207.

A ground crewman checks the camera position on Canadian operated Lysander 434 SP-N of No.400 RCAF 'City of Toronto' Sqn while on exercises when based at Odisha in the UK in the 1940/41 period. Joseph J Scott, National Archives of Canada, PA-138764.

This page and opposite top.
Two photographs of the prototype Lysander lying damaged on Yeovil aerodrome may well illustrate the result of the French test pilot's enthusiasm. Clearly the aircraft has come to rest after a ground-loop caused by the otherwise very sturdy undercarriage beam breaking and losing the port wheel and spat. Note that the cowling is a notably darker colour than the 'Aluminium' painted aircraft, and the small venturi tube on the starboard undercarriage leg. Westland Archives.

They went to Odiham on 9th June 1940, and were used by RAF as a trials unit. It is worth noting that K6127, the Westland prototype Lysander fitted with 2 x 20mm cannon, was attached to No.110 RCAF Squadron for their anti-invasion patrols. The cannon were intended as anti-tank or anti-bridge weapons. The guns could have been quite effective in attacks on the rear of 1940-era tanks provided armour piercing ammunition had been acquired from the French (the British focused on high explosive) as the German ones didn't have much armour there. Whether the Lysander would have survived in the face of ground fire is another matter.³ 110 RCAF Squadron were the first unit to receive the Lysander Mk.III and later the first to change to the Curtiss Tomahawk (in 1941). They were not the only Army co-operation Canadians in Britain though, as 414 RCAF formed at Croydon on 12th August 1941, equipped with Mk.I & Mk.IIIA Lysanders, and also Tomahawks, but they were all replaced by Mustangs by the end of 1941. More Canadian Army co-operation Squadrons were formed in Canada, but the Lysanders were passed on for training, and remainder of the production run (by Victory Aircraft Co. at Toronto) went to target tug units for the Empire Air Training Scheme. One aircraft, 2418, was fitted for glider towing.

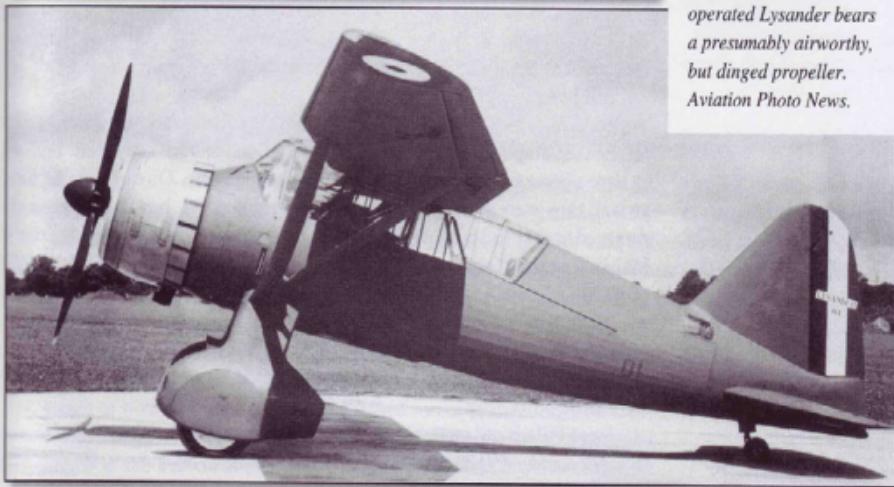
France

A single Lysander was ordered before the war by the French for evaluation, despite (or perhaps because of) the fact that the French test pilot had managed to damage another Lysander on a test flight at Yeovil. The sole French Lysander, 01, was shipped to France⁴, although other sources seem to confuse the above accident with this French machine. The French then had other worries over aircraft production, and no more Lysanders were chosen until the Free French units in North Africa obtained 24 Lysanders which remained in RAF colours with the addition of French roundels and the Cross of Lorraine. At least one Free French Lysander found its way to Paris at the war's end. (See page 184).





Middle: The Westland official photograph of the only pre-invasion French Lysander. What happened to this aircraft seems to be unknown. Colours are standard for French aircraft of the period, Khaki (an actual Armée de l'Air shade) overall with a natural metal cowling and 'LYSANDER 01' in serif lettering on the rudder. Westland Archives.



Bottom: A Free French operated Lysander bears a presumably airworthy, but dinged propeller. Aviation Photo News.





Sqn Ldr Majumdar receives his DFC from Field Marshal Sir Claude Auchinleck ('the Auk') for leadership during the Burma operations. Via Bharat Rakshak.

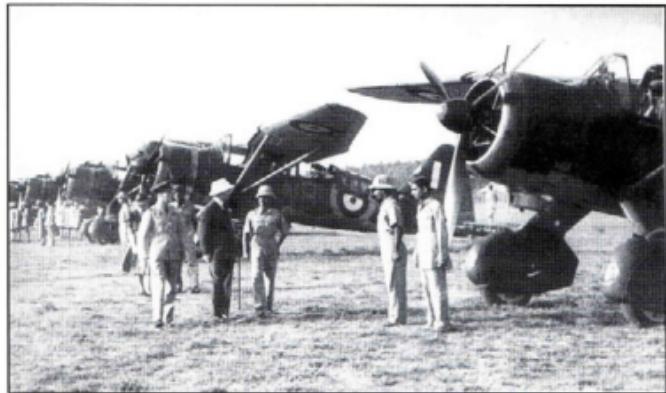
India & Burma

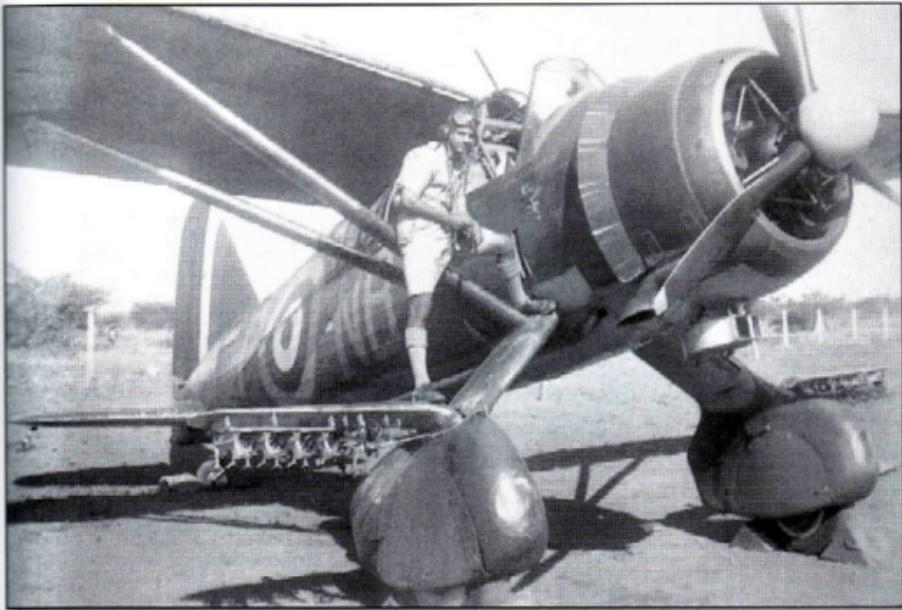
The pressure of the European war drove the move to devolve responsibility for the North West Frontier and the Indian coast to the Indian Air Force (IAF). Imperial racist doubts about the Indian crews' ability to manage modern aircraft were swiftly scotched by the excellent efforts of the Indian airmen. On November 7th 1941, the Governor of Bombay, Sir Roger Lumley ceremonially handed over No.1 Squadron Indian Air Force's Lysanders, which had been paid for by the citizens of Bombay. The unit took the title 'Bombay Squadron' and were also known as 'The Tigers', a title they lived up to. The Indians were highly aware of potential British criticism, so when an aircraft overshot and another bogged down trying to avoid it, with a third having a minor mishap as well, the groundcrews worked day and night to repair the aircraft. Of course good-natured but nationalistic rivalry and competition with 28 Squadron RAF on the same base was another factor. Squadron Leader Karun Krishna 'Jumbo' Majumdar led the unit into battle in Burma, leaving Peshawar on January 21st 1942, and arriving in Toungoo, Burma, 17,000 miles and seven stops later, on the first of February. This was the first time the IAF were included in a major war campaign.

The squadron was intended to undertake army co-operation, but the Squadron Leader Majumdar added bombing and ground attack. They were not just to have tigers on their badge but to live up to the name. On the night of their arrival, they were greeted by a Japanese bombing raid, but no aircraft were damaged as they had been well dispersed. Only two days later, Squadron Leader Majumdar carried out a personal solo reprisal raid, escorted by two Buffaloes of 67 Squadron RAF, on the Japanese airfield at Mae-Haungsang, dropping two 250lb bombs from his Lysander. On the 4th February the whole squadron undertook a follow-up raid. With two 250lb bombs loaded, and fully-fuelled, the 100 mile flight to Mae-Haungsang took over an hour, and this time they went unescorted.

Jagan Pillarisetti⁵ quotes Pilot Officer Malse's account of the attack. He was flying Lysander P9120 with Sergeant Ghulam Ali as his gunner. He was just behind 'Jumbo' Majumdar during the attack, as he explains:

Sir Roger Lumley, the Governor of Bombay, inspects the Lysanders of No.1 Sqn Indian Air Force at Peshawar on November 7th 1941. The Lysanders had been paid for by a special fund raised by the citizens of Bombay. Via Bharat Rakshak.





"We had no time to look around. Firstly, we were carrying bombs, 250 lbs on each [stub] wing. I was No 2 and Majumdar was No 1. When Majumdar dive[d], I dived, released [the] bomb, pulled back and out to He-Ho, I did not even look down. But I could see the burst [from Majumdar's bomb].

I was told that there was firing, personally I don't know if I was too excited. There must have been some firing, but I didn't notice it in the excitement."

The Indians had made their mark in the 2 hour 45 minute raid, diverting as planned to He Ho to avoid interception. Not surprisingly, the raid boosted the morale of both the unit and the other Allied forces in this desperate campaign. The damage to the Japanese base was worthy of inclusion in the regular dispatches to US President Franklin Roosevelt and British Prime Minister Winston Churchill.

There were other tasks. Jagan Pillarisetti tells a painful story;

"One of the pilots of the squadron, Pilot Officer Satyanarayana was detailed to fly a Chinese General named Yun to Lashio. Before starting, Satyanarayana helped the General into the rear seat of Lysander P9131 and helped strap him in his seat. Having made sure his passenger was secured, Satyanarayana jumped from the side of the rear cockpit to the ground. As he jumped, a ring he was wearing on his right hand got caught in the ammunition box stowage on the air gunner's Lewis Gun. The ring cut through Satyanarayana's skin, nearly severing his finger in the process.

Satyanarayana fell to the ground in pain, the ring having very nearly severed his finger completely. 'It was hanging by just the flesh' recalls Ratnagar. Satyanarayana shouted in pain and passed out. The Squadron doctor came up and inspected Satyanarayana. It was pretty obvious that he was not going to do any

F/O A R Pandit with his Lysander at Trichinopoly during May 1942. Just visible is the tiger marking by the cockpit as well as the NB squadron code. Amit Javadekar Collection Via Bharat Rakshak.



A posed press call photo of an RAF airman working with an IAF airman on an IAF Lysander serves to show the detail of the manual gun cocking handle in the spat, and the ammunition tray in the leg. The stores carrier, sway brace and electrical release are also visible. IWM.

flying. It was an awkward situation, Gen Yun was sitting in the rear seat of the Lysander, all strapped in and ready to go, and there was no pilot to fly him!"

Another pilot, Flying Officer Ratnagar, was detailed to make the flight. For the return trip, the Lysander carried the ADC to the GOC of NorGroup from Lashio to Toungoo and thereafter to Mingaladon airfield at Rangoon. This problem with jewellery was a risk that the SD Squadrons in the UK were later well aware of, to the extent that a standing order was made that 'Rings must NOT be worn.'

On February 5th the Squadron moved to Rangoon, and was divided, to operate in independent flights from three different Burmese locations: He-Ho, later Lashio; a single aircraft returned to Toungoo; and the third flight remained at Rangoon. There was also another Lysander squadron in Burma, No.28, who lost Lysander P1686 when a bomb slipped from the stub wing and exploded.

Rightly, the pilots believed their chances were not good if intercepted by Japanese fighters, but they flew with all guns fitted and loaded and a gunner in the back. The gunners certainly helped morale, and several pilots reckoned that their lookout was more vital than any shooting would have been in their obsolete Lysanders. Their concerns were luckily never put to the test. Despite the unit's excellent luck in avoiding Japanese fighters, and support from a couple

of American Volunteer Group fighters (possibly in fact RNZAF Buffaloes) Pilot Officer Jatain Deuskar and his gunner, Sergeant Kameshwar Dhora, were killed when Deuskar tried to force land the Lysander in a field, after running low on fuel and probably trying to save the aircraft. It overturned. They were cremated by a unit ground party, but were (amazingly) the only casualties of this tour. The rough airfield caused havoc with the normally robust Lysanders, and the often overlooked work of the ground crews is illustrated by the invention of a wooden tail wheel as a temporary measure.

In an interview with Moolgavkar, who was a Pilot Officer in the Mingaladon based Flight under Flt Lt Niranjan Prasad, Jagan Pillarisetti was given this account of the raid on Martaban;

"We were still short of the targets. Maybe four to five kilometres. The Japs had put up guns expecting us. Anyway in the AA barrage, I see Niranjan flick his Lysander in a roll, UPSIDE DOWN and dive away. Literally upside down that too carrying those bombs - dangerous I tell you, the roll could have snapped off the stub wings as well as the undercarriage. A Lysander is not supposed to be rolled. We had airgunners in the back but they were not of much use. Luckily we never encountered any fighters. Anyway as soon as Niranjan rolled and dived, the rest of the formation broke off in all directions. I do not know where they dropped the bombs, but they made their way back in ones and twos.

I myself put the Lysander in a dive. I did not roll it as Prasad, no point in doing so. And as I started to pull up, I let go of my bombs hoping the momentum will carry them towards the target."

Due to KK Majumdar's leadership and example he was awarded the IAF's first DFC. However, the British and their allies were forced to retreat, and the Indians sent an advance ground party back to Dum Dum, Calcutta. Several times they were offloaded from their transport in favour of British servicemen, and only by intercepting AVM Stephenson, who personally ordered a batch of RAF airmen off in favour of the IAF men where they able to get from Magure to Akyab. Lysander P9180, flown by Flying Officer Ratnagar, was probably the last out of Burma.

On May 20th, No.1 Squadron moved to Trichnopoly and soon afterwards re-equipped with Hurricanes, conversion taking place at Risalpur. Ironically, they encountered Lysanders soon after in training for air-to-air firing. After the war, Air Vice Marshall D F Stevenson CBE, DSO, MC said:

"The units of the Indian Air Force referred to above proved their war efficiency and gallantry on active service. In addition to a number of tactical reconnaissance, No.1 Indian Squadron's Lysanders provided 41 bomber sorties against enemy aerodromes and direct support targets."⁶

Burma saw Lysanders again when 20 Squadron RAF returned for tactical reconnaissance in December 1942 for the attack on Akyab down the Arakan river.

Top: A line-up of Irish Air Corps Lysanders being started one by one. Again, only one of the five aircraft has its wheel covers removed.
Westland Archives.

Lower: One Lysander with three Gloster Gladiators, all being allocated to No.1 Fighter Squadron IAC. Due to treaty obligations in the 1930s the Irish were only allowed to buy British aircraft, yet had a second order for Gladiators embargoed by the British Government. G. Paul.



Ireland (Eire)

Six Lysander Mk.II aircraft were supplied to Ireland, numbered 61 – 66, from the Westland production line. The first aircraft of this batch flew on June 8th 1939, but they were delivered to Ireland on 15 July 1939. Lysanders 63 and 66 were later converted to the target tug role by Shorts in Belfast. The aircraft were almost all scrapped in 1946, but Lysander 63 was the last to fly, airborne in April 1947.



Egypt

The Lysanders in the Egyptian Air Force were rather like pawns in a political game, of which WWII was just a sideshow. In 1939, Egypt established a theoretically independent air force, the Royal Egyptian Air Force, which was in fact closely directed by the British with RAF officers advising in each unit. Eighteen Mk.I Lysanders were delivered to No.1 Army Co-operation Squadron, direct from production in 1938 and numbered Y500 – 517, plus two others (R2650 – Y518 & R9000, a Mk.III) later supplied from RAF stocks. They commenced training at Almaza near Cairo, alongside 208 Squadron RAF, and were presented to the "pleasant but ineffective"⁷ Brigadier Ali Islam Bey, the director of the REAF. At the start of the war they suffered serviceability problems, not due to any slackness on the Egyptians' part, but because spares were allocated to the RAF first. Tyre pressures for the Lysander were too high for desert conditions, resulting in the risk of overturning on landing. Ali Islam was replaced by Brig. Hasan Pasha Abd al-Wahab, whom the officers of the Squadron saw as King Faruk's spy, as well as being a disciplinarian. The British were pleased with his attitudes, and tension began to develop.

David Nicolle wrote;

"Fear of the Italian Auto-Saharan deep desert forces remained until 1942, though these never proved to be as dangerous as initially thought. As a result, throughout the Second World War the Egyptian Army defended the vast Western Desert south of the Qattara Depression, while the main battles of the North Afri-

*This page and overleaf:
A Royal Egyptian Air Force
Lysander after nosing over
shows a good view of the
wing surfaces, and a gun
camera is fitted above the
starboard wing root. What
role the dog is to play in the
rescue remains a mystery.
Westland Archives.*





A Royal Egyptian Air Force Lysander on roll-out at Yeovil. Westland Archives

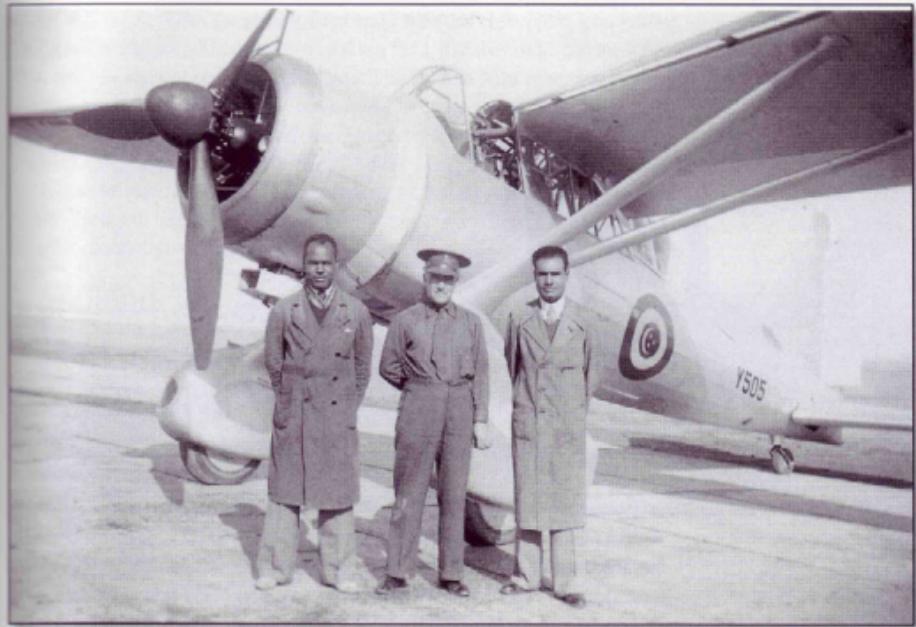
can Campaign were fought along a narrow coastal strip to the north. ...For the Egyptians it would be a lonely war, with very little action, but years of tedious patrolling. In this, the REAF's Lysanders supported the men who held isolated outposts for months on end with never a sight of the enemy."

Doubts by the British over the loyalty and effective use of the Egyptians as an autonomous force resulted in the REAF Lysanders in the Western Desert being brought into the British forces and given RAF style codes. It is probable that the squadron code 'GF', seen in a famous photograph, was that allocated to No.1 Squadron REAF.

The long hours of frustrating patrols for No.1 Squadron with their Lysanders, scanning the huge desert were, not surprisingly, causing significant wear on the aircraft. At a low point only six aircraft were serviceable, although this climbed to fifteen again by December 1940. The Lysander carried out numerous anti-submarine patrols over the Suez area, plus target-towing for the Egyptian AA units and the Royal Navy. Due to the casual attitudes of the British toward Egyptian territory, and nationalist developments among many Egyptian forces officers, the whole of the REAF was stood down because of a number of incidents in 1942, including attempted defections to the Axis forces and attempted sabotage.

Partly because they were active in operations, it appears that No.1 Squadron personnel were not involved. The British concluded that the issues were more a case of Egyptian nationalism than Axis sympathy. Nevertheless, all REAF aircraft had their magnetos removed to immobilise them in the Autumn of 1942, and a purge of officers was carried out, before the REAF and the officers were quickly reinstated.





Top: Three unidentified men in front of Egyptian Lysander Y505. Westland Archives

Below: A line up of immaculate REAF Lysanders 'on parade'. Interestingly only the third aircraft seems to have the wheel covers removed. RAF Museum P2020.



Groundcrew remove the camera from a Polish operated Lysander Mk.II on return to base as the pilot climbs down. IWM.



Mk V parachute supply dropper



M-Type dinghy in SBC



A Lysander pilot, Gerry Scott DFC, remembers being detached from No.4 Squadron to Manston for the nascent ASR service in October 1940. Manston had been abandoned by Fighter Command as too dangerous, so the Lysanders were the only aircraft based there!

"Our task was to locate aircrew that had ditched or parachuted into the sea, and we worked closely with the RAF High Speed Rescue Launches, based at Ramsgate and Deal. We had no radio communication with them, but we had worked out a series of signals, which were very adequate. If we found anyone we marked the spot with a yellow smoke float and then guided the launch in the right direction. We also carried two dinghies, which we dropped to any survivors who were not already in their own personal dinghy."³

Gerry's searches were not always undisturbed. "On November 27th, we were bounced in mid-Channel by a Bf109, who had either been sent to see us off or who was returning home after a particularly hard day. I think it must have been the latter because we survived after a nerve wracking chase almost back to Dover. I could see the white cliffs, and prayed I could reach them whilst performing all the antics I could muster to throw off his aim. Mac [Jimmy MacAleese] expended a lot of ammunition and by a miracle we made it."

Soon after the Lysanders were employed, the Supermarine Walrus was pressed into the role, proving both that amazing rescues could be achieved in appalling circumstances, and that alighting might be possible although taking off afterwards was often not. The Lysander perhaps did better, by offering less direct assistance but aiding a greater number of rescues.

In 1942 Lysander spares were running short, as stocks had been sent to the Middle East and India. A new type was sought for ASR, resulting in the allocation of the Boulton Paul Defiant to ASR units, having itself just been replaced by Beaufighters in the night fighter role. Quickly, the Lysanders were down to one



for each of the four ASR Squadrons, and in 1943 they were finally withdrawn. (For further information, see the MMP books on the Defiant and Walrus.)

The Lysanders were sometimes in need themselves of ASR help, when the ASR Lysanders themselves ditched. Much later in the war, on December 16th 1944 a 268 Squadron Lysander was the recipient of a rescue attempt by Warwicks of 279 ASR Squadron, who dropped two airborne lifeboats and a dinghy to the two men seen in the water at a location seventy miles north-north-west of Bergen. Despite valiant attempts in worsening weather and the onset of darkness, nothing more could be done and the following day only a dinghy with a body aboard was found.⁴ What the aircraft was doing there, so far from the UK, was a mystery to the Warwick crews, but seems to have been a case of flying a reciprocal course – ‘red on black’ in error.

Target towing

One role that had been originally specified for the Lysander was target towing (TT): monotonous and potentially dangerous work, often completely overlooked. However, given the appalling gunnery standards of most new (and too many experienced) fighter pilots, much more live firing at targets was clearly needed. From 1940 this was the task of the seven TT flights of Lysanders, until they were again replaced by Defiants in 1942. Some twenty MkI Lysanders were fitted with electrically powered winches, converting them to TT.I and T.III.

A young Michel Hougham⁵ remembers how it worked; “The coast at Beltinge must have been singled out as an aircraft firing range. An aircraft was used to trail a large windsock on the end of a long cable, and this windsock was used as the target by fighter planes whose pilots were in training. The target was towed backwards and forwards just offshore or over the cliff tops so that with the attacking fighters approaching from the land side, the wayward bullets eventually found themselves ending up in the sea, rather than on to some house or farm as would have happened if the attack had been made the other way round.

Early on, the aircraft used for the task of towing the target was usually a Lysander... These Lysanders had a little winch mounted alongside the cabin and the windsock cables were reeled in and out by this means. The Lysander would trundle back and forth for hours while one, or sometimes two, attacking

This photo of a UK based TT Lysander shows the conflicting need of high visibility to avoid being shot at in error and warning that it is a tug (yellow and black stripes from below) with the need for camouflage to avoid attack from a marauding enemy aircraft.

Aviation Photo News.

Fred Ballam recalls:

“The TT III’s had problems with high oil consumption as they spent a good bit of their time flogging around the skies at max continuous power with a large drogue behind them. They used to have to be wiped down after practically every flight to get rid of the thick film of oil, this was one of the chores we used to get when we visited RAF Warmwell as ATC Cadets. Sometimes, as a reward, we got a flight squeezed in with the winch operator!”⁶

A Canadian based Lysander TT contrasts its overall bumble-bee scheme against that of the example on the previous page.
Aviation Photo News.



Spitfires or Hurricanes would swoop round and round firing short machine-gun bursts at the windsock target."

John Hurst⁶ was a trainee air gunner when he had his first flight in the Boulton Paul Defiant in 1942;

"The [gunnery] range was about 4 mile from the coast over the North Sea. Here we were met by a Westland Lysander towing a drogue. Our aircraft and the Lysander flew parallel with the coast, the Lysander being about 800 yards from us on the seaward side. The pilot then told me to fire at the drogue when ready, this I did in short bursts until all 500 rounds had been fired, we would then return to base where the hits on the drogue would be counted and recorded. This routine continued, punctuated by classroom work for 8 weeks."

Later, John⁷ was an Air Gunner Instructor with No 4 Air Gunnery School at Morpeth in Northumberland; "Here we were kept very busy teaching trainee air gunners in the skills of air gunnery. It involved much blackboard work in the classroom, as well as flying in Ansons, and firing at drogues towed by Lysanders. We flew from 7am to 7pm during the summer, some days flying ten 40 minute trips a day."

Hugh Aitken⁸ served in 1485 Bombing, Gunnery, Towing Target Flight. He recalled that in late 1942 "I was at RAF Station Coningsby where for an additional 1/6 pay a day (danger money) as a winch operator I would let out the

There don't seem to be any photos of TT Lysanders 'in action'. "Trolling for Sharks" by Don Connolly is a painting of an RCAF TT Lysander towing a drogue target for attack by Blackburn Sharks. Courtesy the artist and the RCAF Memorial Museum, Trenton.



drogue for target towing from a Lysander for air to air gunnery practice from other aircraft in flight."

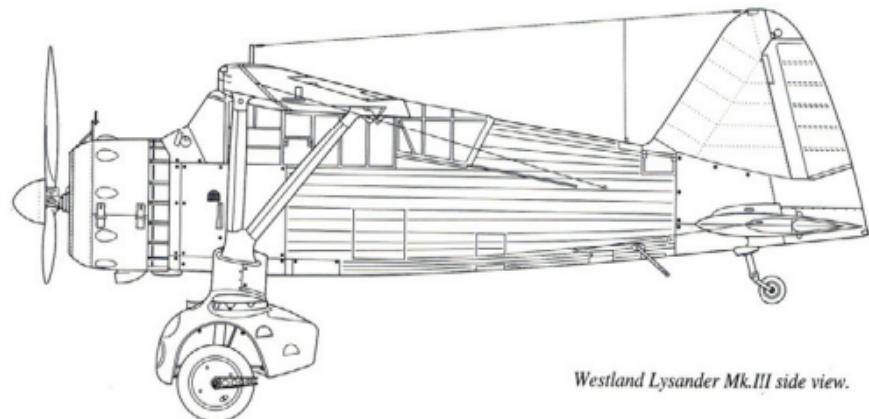
In addition, Lysanders were used by No.1 Anti Aircraft Calibration Flight to check predictors and radar at AA batteries. The task increased, the Flight becoming 116 Squadron in 1941 with 22 Lysanders on charge, although in 1942 the unit re-equipped with Airspeed Oxfords.

Royal Navy use

The Royal Navy Fleet Air Arm used several Lysanders at Worthy Down where they were used for Telegraphist Air Gunner (TAG) training with 755 Naval Air Squadron, and at Arbroath with 754 NAS. Among the other crew at Worthy Down was one Lt L Olivier RNVR, who later achieved fame as a Sir Lawrence Olivier. Initially the unit was equipped with RAF ground crew until enough naval ratings could be made available. Light bomb racks were fitted, enabling the pilots to practice their bombing skills; but with what intent one can only speculate. Lieutenant Commander WHC Blake RNVR recalls collecting several aircraft from RAF Lynham, Wiltshire. The Lysanders were withdrawn from Naval use between 1942-3 and converted to special operations

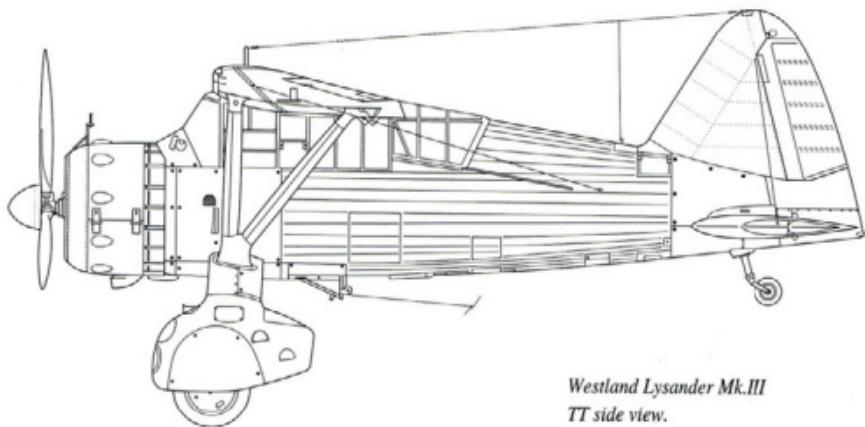
A proud 755 NAS Royal Navy pilot aboard 'his' target tug Lysander.
FAA Museum.



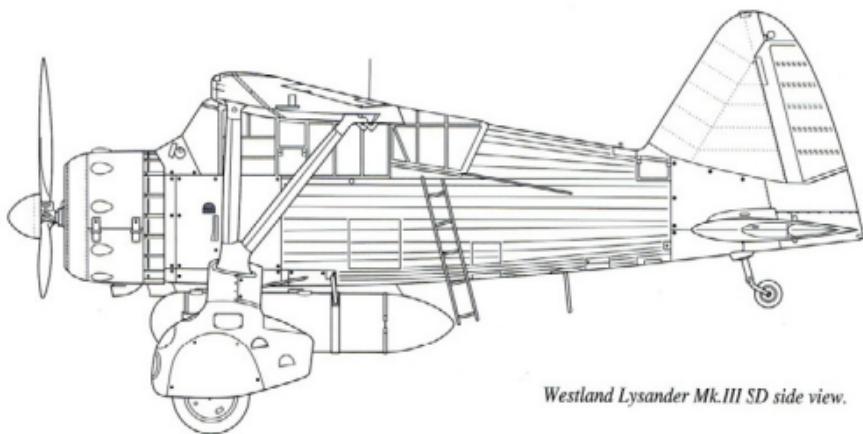


Westland Lysander Mk.III side view.

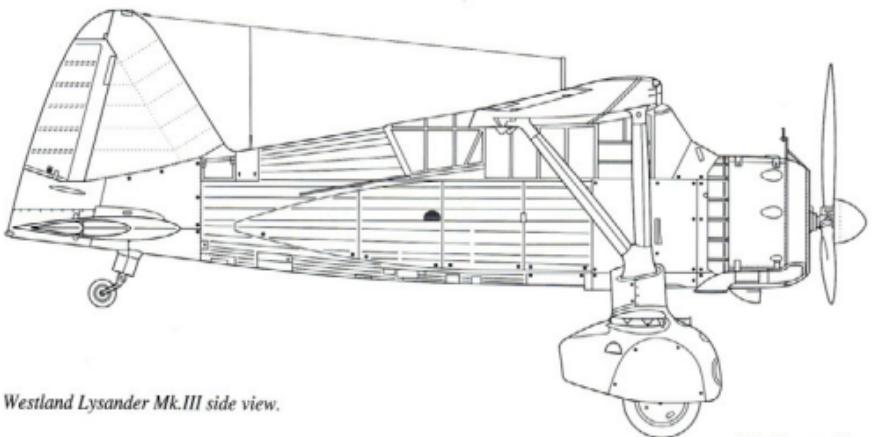
1/72 scale



*Westland Lysander Mk.III
TT side view.*

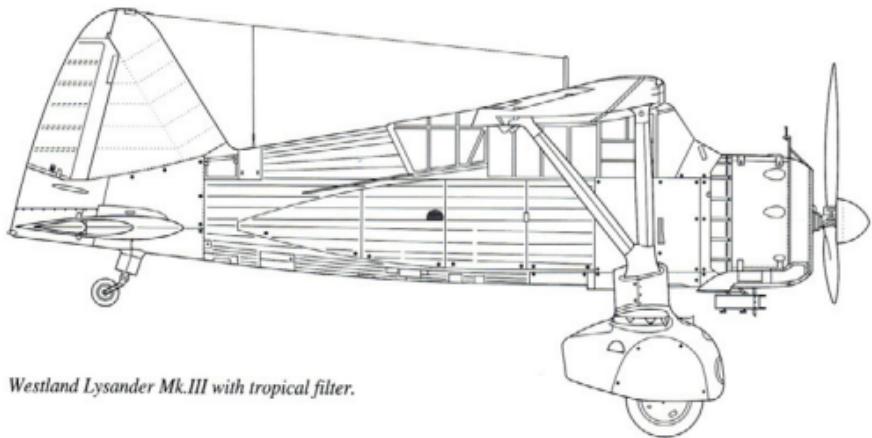


Westland Lysander Mk.III SD side view.

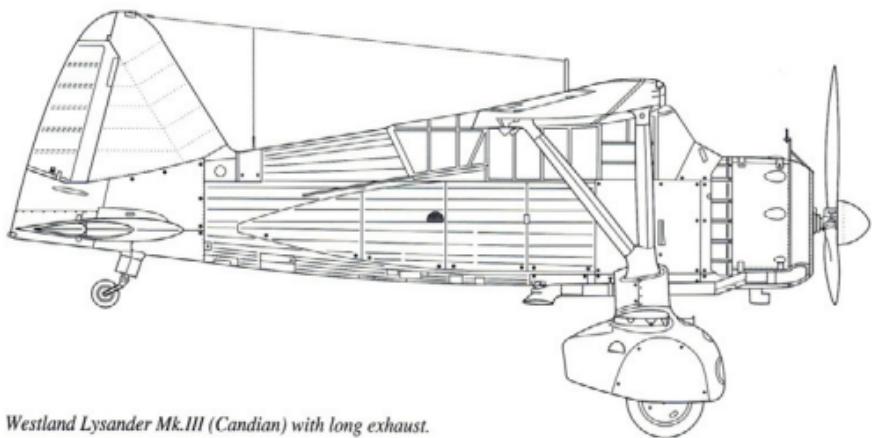


Westland Lysander Mk.III side view.

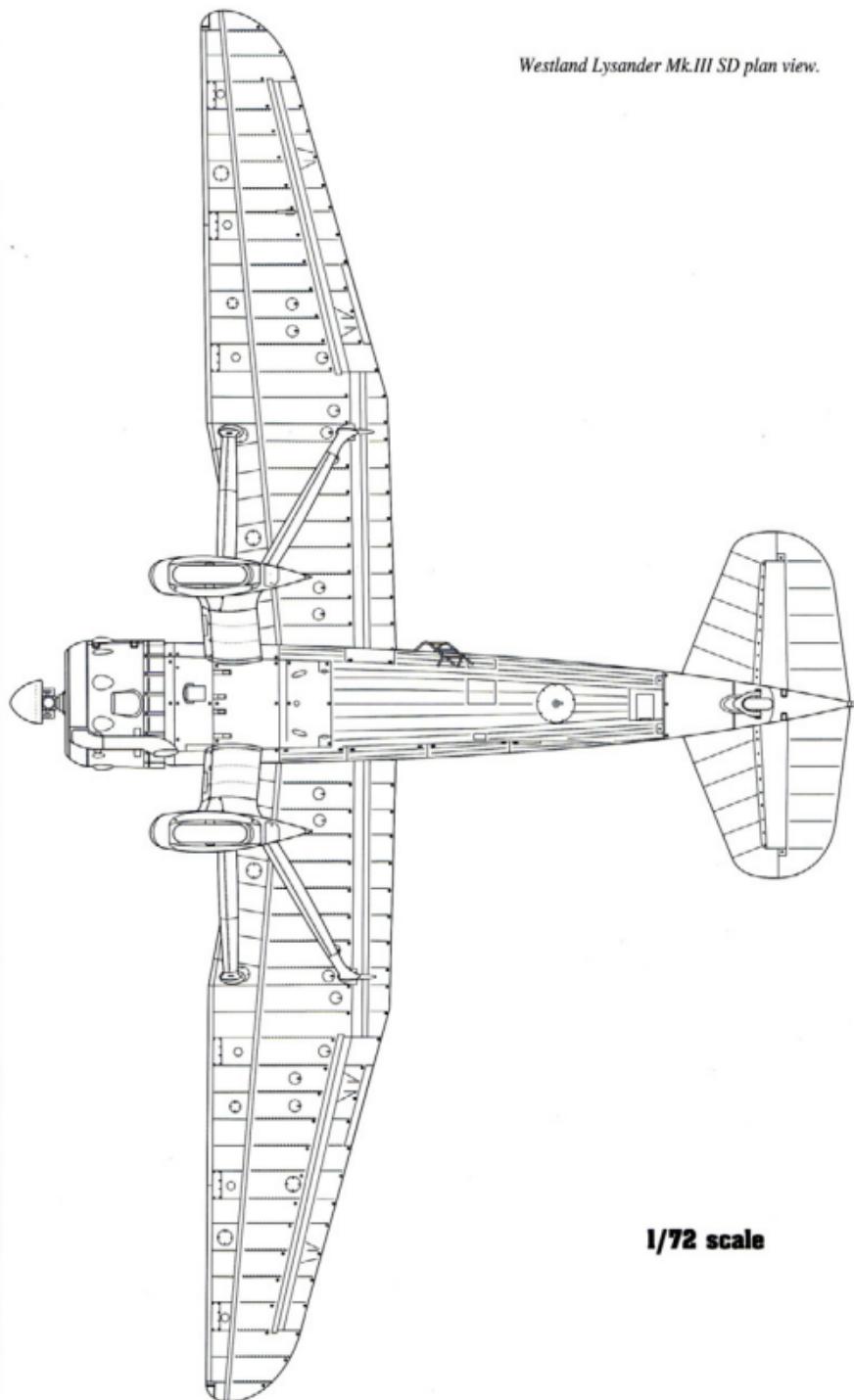
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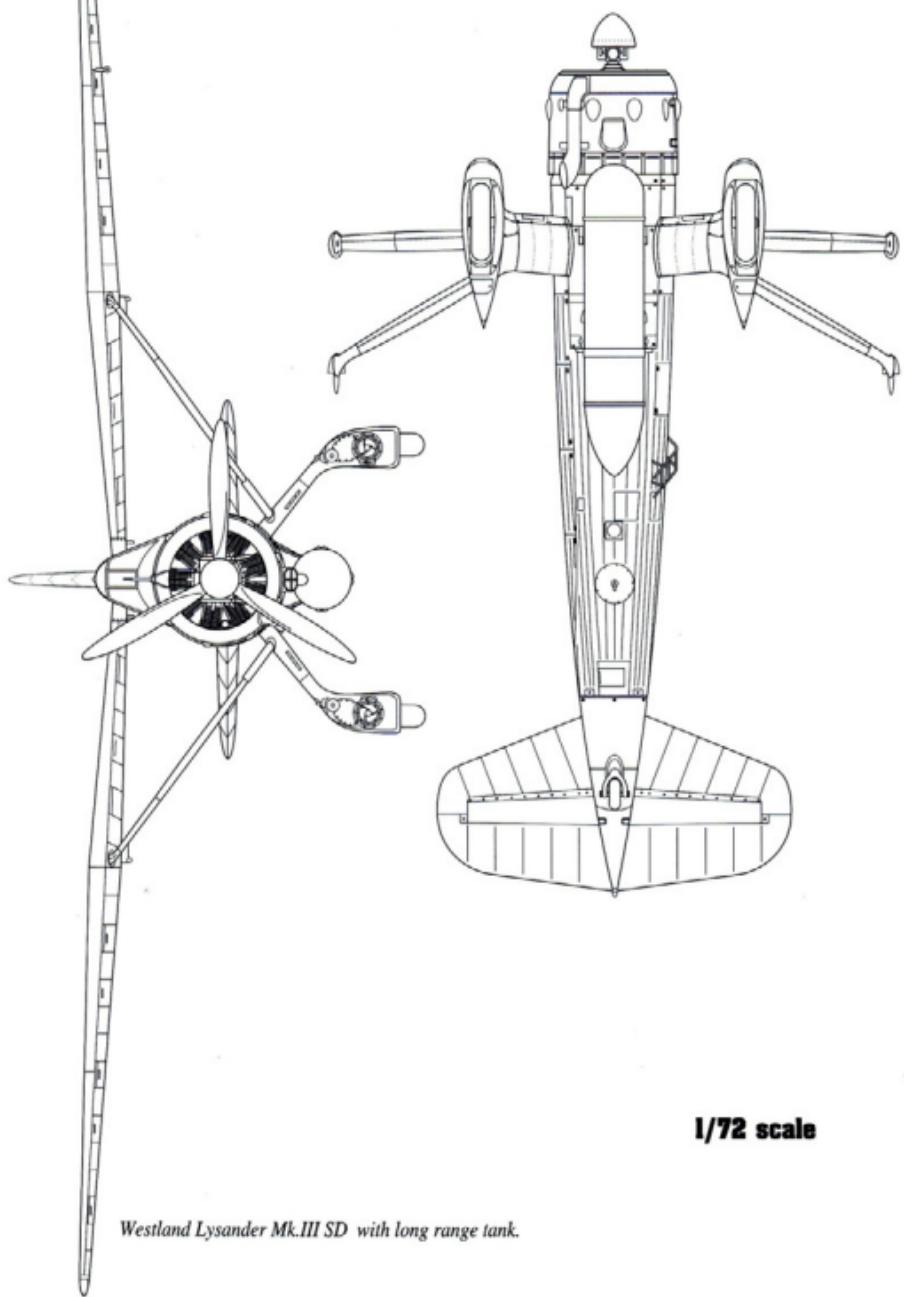
Westland Lysander Mk.III with tropical filter.



Westland Lysander Mk.III (Candian) with long exhaust.



1/72 scale



1/72 scale

Westland Lysander Mk.III SD with long range tank.

A very lucky pilot examines the loss of wing fabric on a Royal Navy Lysander, V9285 W6-I duplicating the accident mentioned on page 12. The wing fabric has certainly seen some heavy use, with patching and wear evident throughout. Westland Archives



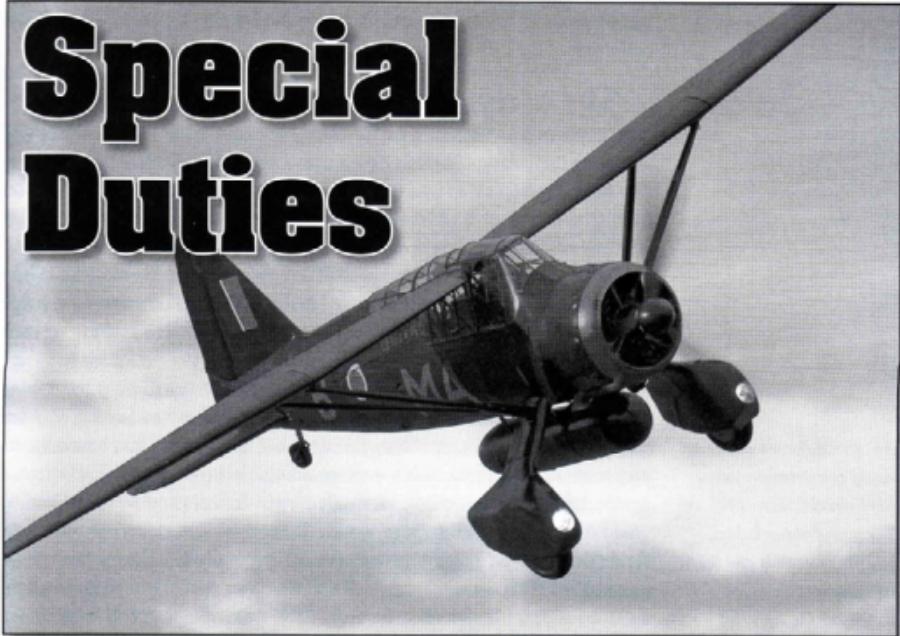
Footnotes

1. BBC People's War website. A3356589
2. Rescue From the Skies p3
3. Scott, Wingspan 49
4. Rescue From the Skies p97
5. BBC People's War website. A1950068
6. BBC People's War website. 4420540
7. BBC People's War website. A4420630
8. BBC People's War website. A2838954
9. Fred Ballam, private correspondence.

Royal Navy Lysander Mk.IIIA V9618 at Tayside, Scotland in 1941 when serving with 754 Naval Air Squadron. FAA Museum



Special Duties



Westland Lysander

Facts & fiction

The clandestine operations over France and Europe in which scores of agents - 'Joes' - were delivered and picked up, is undoubtedly the Lysander's greatest claim to fame. During WWII it was regarded as among the most secret of operations, but afterwards it became, justly, the most famous of the Lysander's tasks. The activities of the four Special Duties Squadrons, 138, 148, 161, and 357 and their predecessors have already filled several books and been featured in films. Because of the secret nature of these operations, many errors and myths have grown up over the years, and rather than trying to tell the story in total (very well done by the Lysander Flight's commander, Hugh Verity, in his book 'We Landed by Moonlight') we will concentrate on those misapprehensions.

It is often assumed that the units supported just the SOE, flew only Lysanders and operated only in France, all of which underestimate the scope of the activities. Most of occupied Europe was covered, from bases in Italy (148 Squadron) as well as Britain, and the Far Eastern squadron (357) is often completely overlooked. Halifaxs, Whitleys, Stirlings, Hudsons and a miscellany of other types were used. The main direction came from the SOE and also the SIS (now known as MI6) and the rivalry of the two organisations does not seem to have caused the RAF any major problems, but sorties were also carried out for other organisations as well, albeit usually under SOE or SIS coordination.

The Lysanders did not normally undertake parachute or stores drops (these were handled by bigger aircraft) but they did do some mail pick-ups with their own version of the pick-up hook, a fitment already forgotten as having been

An atmospheric modern photograph of the Shuttleworth Lysander recreating the days of the Special Duties Squadron at an evening flying display at Old Warden in 2005. Darren Harbar.

part of the army co-op units kit. Of course the main task was the delivery and collection of the incredibly brave agents.

The early efforts

In the early days, the Lysander was just one type used on ad hoc missions. The first official pick up by Lysander was by Flight Lieutenant W J Farley on the night of October 19-20th 1940, landing near Montigny to pick up an agent who had parachuted in ten days earlier.¹

In fact an operation so secret that it did not appear in the No.2 Squadron Operations book and was only recorded in the pilot's logbook as a 'long range air test'. Wing Commander Geddes flew from Newmarket to Tours in western France on September 3rd 1940 to deliver an agent to a reception committee.²

The second official pick up was by an ex No.2 Squadron pilot, Flying Officer FMG Scotter. 1419 Flight at Stradishall dispatched Scotter on April 11th, 1941, "the Lysander being fitted with a long range tank, a step ladder and some modifications of his own including blackout curtains and plywood fairing of the rear cockpit."³ He evaded night fighters and was muddled by cloud shadows and the shape of woods from the air, but eventually found the field. He landed on incredibly rough ground and nearly broke the undercarriage crossing three narrow ditches, which also nearly stopped the engine - when the field seemed to fill with Frenchmen. Lt 'Cartwright', the agent, leapt aboard as various cases were flung in after him, and shouted "get the hell out of here quick". Pulling extra emergency boost Scotter got the Lysander into the air as he saw car headlights racing towards the field. He never found out what happened next on the ground.

An official record shot of the newly converted prototype SD Lysander, June 1941. The mix of old style high visibility roundels and SD equipment is incongruous. Note the tow-rail dipole aerial below the rear fuselage; this was a rare fitting for the Lorenz blind beam approach.

Westland Archives.



Modifications

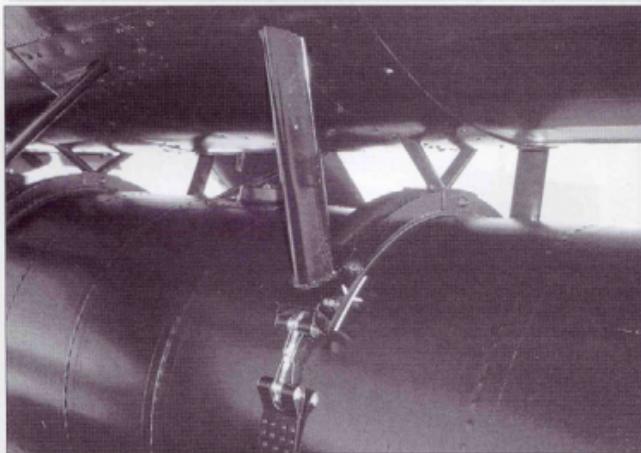
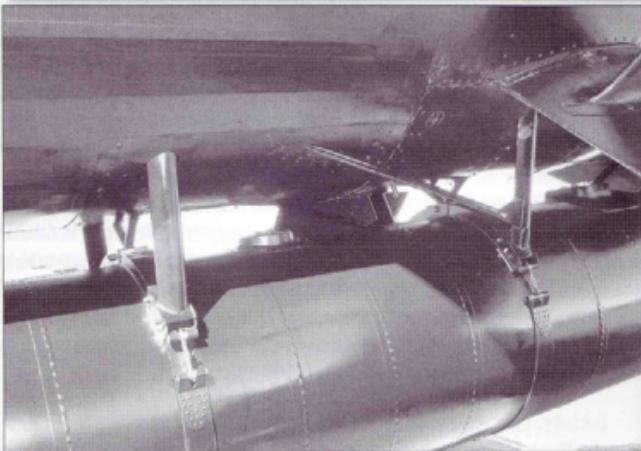
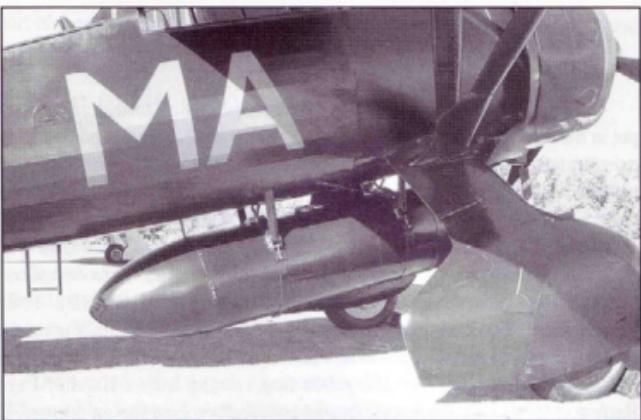
Once the squadrons got into their stride, more permanent modifications were put in hand, albeit under top secret cover. The Lysanders were modified from existing machines, under a Ministry of Aircraft Production contract entitled 'Special Contract Westland' (SCW) which has occasionally incorrectly been given as the type designation, and Peter Proctor, Chief Assistant Designer at Westland, was responsible for this work as well as the Target Tug designs. The aircraft were re-designated 'SD' for 'Special Duties', and all were conversions of second-hand machines, mainly Mk.III, making them Mk.III(SD). Peter Proctor said: "I remember great secrecy about the question of increasing the range of the Lysander. In particular, I had to find a suitable long range petrol tank. We found an internal 150 gallon tank coming from a Handley Page Harrow... It was a De Berg tank, riveted and ideally robust for our purpose. It was secured in the same way as on the Harrow. Of course we had to modify the existing oil tank to increase its capacity. This made its replacement quite a headache." The cylindrical tank, hung like a torpedo below the fuselage, was not jettisonable, and had a nose and tail cap fitted to make it slightly less blunt, and a sealing cover. With this, endurance went up to something in the order of eight – ten hours. The rear cockpit had all the gear removed, except the radio, which the pilot was able to use, and a bench seat facing aft for two, plus a parcel shelf where the gun mounting had been. The floor was replaced, to remove all the fitting required by the army co-op or ASR units. A tubular metal ladder was attached to the port side and had rungs painted white to help the agents boarding. There was normally no means of communicating between the pilot and those in the rear cockpit, due to the fuel and oil tanks between them. The loaded weight went up a massive 58% and cruise reduced by about 25mph, but the range nearly doubled to 1,100 miles.

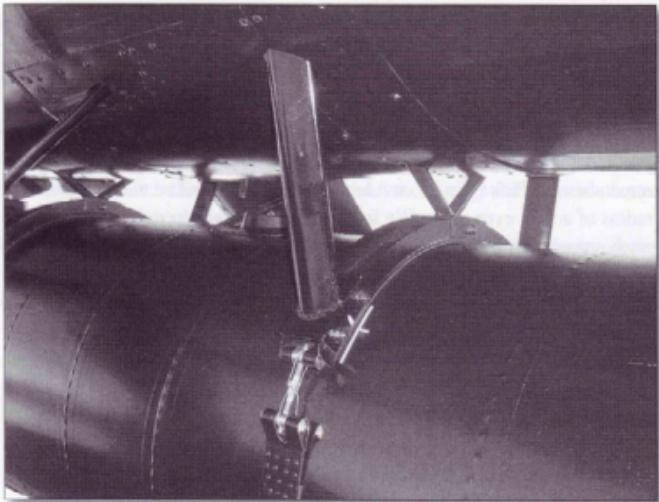
Initially, they were painted overall black, but in his book 161 flight commander Hugh Verity states "The whole aeroplane had been painted matt black all over, in the mistaken belief that this would make it invisible at night. While



Lysanders under conversion to SD versions, probably at Aldenham airfield, where Fairfield Aviation undertook the top-secret work on behalf of Fairley's. The second nearest aircraft retains its 'sky' under wing colours while the farthest one has the TT striped wing of their former users. Westland Archives.

Four views of the long range dummy tank fitted to the Shuttleworth Collection Lysander. Unlike the real thing, this is not used and is a modern replica, rather than an original unit. James Kightly





Lower: Lots of contemporary detail in this shot, including the mattness of the paint, the '12 VOLTS' and 'FIRST AID' serif stencils, the original overload tank below and the (just visible) later upper internal oil tank inside the canopy between the crew and the details of the original ladder, and fluorescent paint. Westland Archives. The small tank immediately behind the pilot's head was originally a supplementary fuel tank but when the aircraft was modified for the SD role with an extra 150 gallons of fuel in the ex-Harrow tank it was realised that the oil capacity needed to be rather larger to cope with the Mercury's thirst for oil when it was run at near max-continuous power for long periods. The total volume was about 18 gallons which included some airspace for expansion when the oil warmed up. With the aircraft max weight raised from about 5,800lb to 10,000lb the power was needed when loaded to the maximum. (See the close up photos on page 135.)¹⁷

this may have been true for searchlights, the night fighter's view from above on a moonlight night was a very different matter. We found the silhouette against low cloud was far too positive. So I had the upper surfaces re-camouflaged in dark green and pale grey."⁵

The black Verity refers to was originally the very matt RD2 'Night' a sooty, dusty paint. Some modifications were quite unofficial. Peter Proctor remembered: "Pick [Wing Commander P.C. Pickard] asked me to increase his radius of action even more. We found the answer was to replace the variable pitch propeller by a constant speed propeller. I was told that the Blenheim also had Mercury XXX engines... we pinched a propeller from a Blenheim at the other end of the field.... The modification increased Pick's radius of action by 12.5%!"⁶ It seems that this became a normal modification for SD aircraft.

On Dec 15th 1943, Bob Hodges trialled a Lysander fitted with the navigation aid 'Gee' normally fitted to heavy bombers. Later SD Lysanders were fitted with a 'towel rail' aerial under the rear fuselage.

The operations

A typical operation would involve a flight from the 161 and 138 Squadron base at Tempsford, Bedfordshire, to position at Tangmere at the start of a (hopefully) moonlight night. The pilot would then set off after nightfall and navigate to the chosen field, which would have been recommended by the local resistance group and checked out by the RAF with a reconnaissance photograph. On the ground, the resistance group would flash the agreed code letters to the pilot and would then set up a 'flarepath' made up of three torches forming an inverted 'L'. The pilot would then land up the long arm of the 'L' (a twenty-yard runway) and the agent would board the Lysander by the specially provided ladder. As quickly as possible, the Lysander would then taxi downwind and take off on the same extemporary runway it landed on, and they would make their way back to Tempsford before dawn.

The pilots navigated themselves - a challenging task and as one put it, mainly a case of 'black and white': 'black' being the woods, and 'white' the railways and reflective waters of rivers and lakes. A little thought will clearly highlight the risks faced on even an 'ordinary' operation, but no operation was just average. We illustrate some of the events that the pilots and their passengers faced:

On the April 19-20th 1943, James Atterby McCairns, DFC, MM, dropped off two agents and found no less than four passengers boarding. Three had been managed before, but this was a first. Two faced aft on the bench set, while another sat on the luggage rack. The last sat on the floor under the rack. Verity says "that Lysander was 'full as an egg.'"⁷ On arrival back in England, one of the cramped passengers kissed the oily tarmac of Tangmere; he was an American crewman who had evaded capture, and as he explained to Verity, he was kissing the ground of the free world – just like Columbus.

Not all aircrew shot down in Europe was so lucky. Leonard Marsh,⁷ a Pathfinder Short Stirling flight-engineer, was hiding on a farm near a secret landing field. He recalls:

"Degeurnes land was fairly flat and close to open woodland with good prevailing winds for aircraft landing. It was very occasionally used by the RAF

special services and, because of this it was my first thought that I might be able to fill an empty seat and get a ride back to UK. Unfortunately getting back to UK this way turned out to be a kind of pipe dream.

First, the weather had to be very good, combined with a full moon which happened about 4 days a month coupled with no rain, no ground mist and then I had to take my turn. For example if I had been granted immediate promotion to something better than a Colonel in the SAS then I might have stood a better chance of getting back home this way.

The strange thing was that this German Radar station didn't seem to have any affect on the occasional landings of SAS [sic] Lysanders. Maybe it was because that they were more interested in bomber aircraft at high levels and didn't know about low flying Lysanders about a mile away."

Sometimes it did not go right. On November 16-17th 1943, Robin Hooper was bogged to spat level when he landed in what he decided was a water meadow. Despite two hours of effort, the help of a dozen Belgians and Frenchmen and four bullocks, the aircraft could not be extracted. He then set the aircraft on fire, and after a month's adventures in France returned at the next moon to Tangmere. At least two SD Lysanders (T1508, V9405)⁸ were captured by the Germans, but the success rate was something to be proud of and a testament to good planning and training, 161 Squadron running classes for agents in how to choose and set up fields.

Josef Zachwieja (later Hartley)⁹ was a Polish Army signaller, serving with the Polish forces in Scotland. His was one of the unusual SD unit's missions;

"I & my whole platoon went to train the Polmont special service unit (S.D.N.W.). My commanding officer was Colonel Bukowski, who I knew from France.... We were going to France with radios & explosives for the Polish Partisans there. My companion was Teddy (Tadeusz) Szynczek or something similar. The trip was top secret. The dates are not in my diary but it must have been early 1944.

We were driven to a small airfield. The Lysander plane was ready & we were off. It was a partly moonlit night & it took most of it to get there. We flew low & landed in a small field. We got our plane undercover & the young French Pole knew the local partisans. I showed them how to use the radio equipment etc. Then it was time to go back. Teddy stayed, but we had another passenger on the way back. I don't know who he was. I had to keep the trip secret."

Trudy Ensor¹⁰ was a WAAF Plotter at RAF Tangmere's operations room. She recalled the extreme secrecy;

"There were Observer Corps stations dotted about the country to whom information was fed as well, but there was one secret news which they were not given: from time to time Lysander aircraft would fly out to France in the night to take an agent or supplies. We knew what was going on but the Observer Corps was not informed. Sometimes they would call up and say, "A Lysander is flying over," and we would deny it, insinuating that they had made a mistake. There would be an agonising wait for the plane to come home and such relief when it did - but, of course, sadly, some did not return."

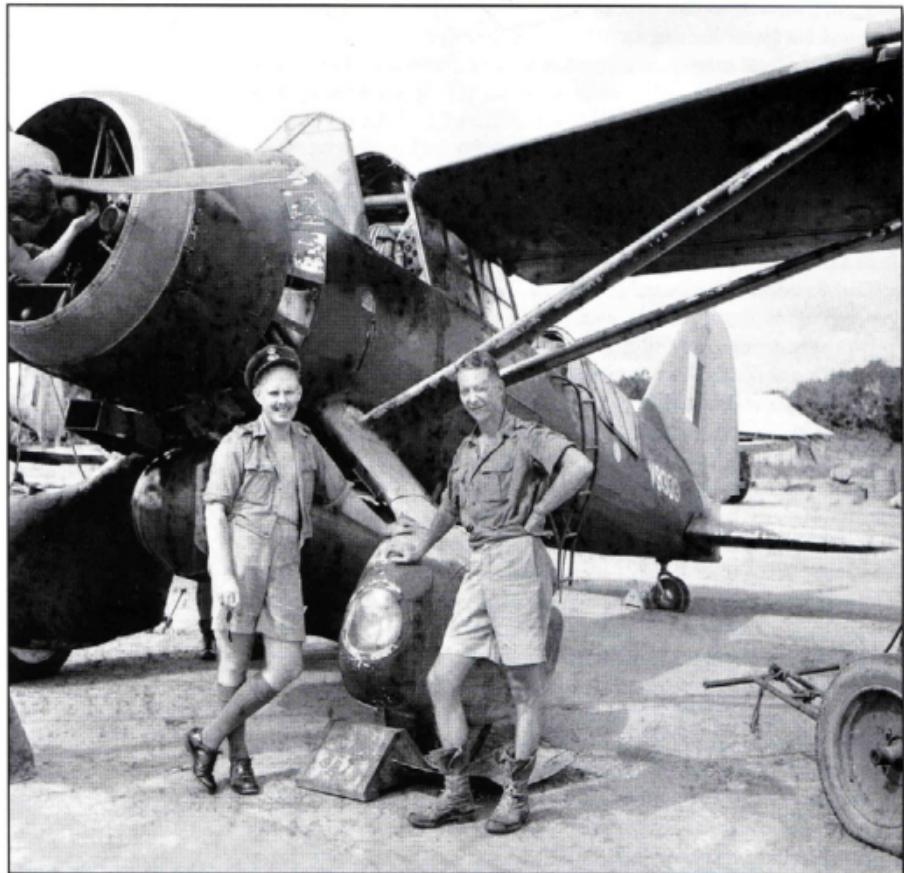
Another view from the ground was Jean Carson's.¹¹ She was a WAAF Radar operator based at Durrington, near Worthing. They were now part of No. 11 Group, controlling aircraft from Ford and sometimes from Tangmere. She

Although damaged, this photograph shows Sqn. Ldr. George Turner DFC (right), CO of No. 357 Sqn, and another unidentified member of the unit with Lysander IIIA V9303 at Mingaladon airfield. The squadron carried out such tasks as supplying members of the guerrilla unit, Force 136, and bringing out former allied prisoners of war from remote Japanese camps. AWM P02284.023

remembers: "...from the GCI were messages from Lysander pilots saying that they would have their bacon and eggs. This was code for their having made a successful drop or pick-up of agents on SOE missions."

In his research Hugh Verity estimated that SD Lysanders undertook 279 operational sorties, of which 186 were 'successful', and that they brought out 410 people from France and took 293 in, quite an achievement by any measure.

In Italy 148 Squadron had one Lysander in 1944 which was later joined by five more, as there was a huge amount of irregular warfare in Italy, Greece and Yugoslavia to support. Operations varied; on one occasion a seriously injured American officer was flown out after Yugoslav partisans had prepared an airstrip behind enemy lines. The last operation by a European-based Lysander occurred on April 23rd when Pilot Officer R C Dalzell landed near Udine, in R9009, a binding brake caused an undercarriage collapse, and the pilot had to join the sabotage teams he was supporting.





August 1945. A Japanese soldier hands a small pack to another Japanese soldier who is sitting in Lysander Mk.IIIA V9818 of 357 Special Duties Sqn at Mingaladon airfield Burma. A third Japanese soldier is also in the cabin of the aircraft. They are about to fly to remote areas of Burma where they will be dropped in to Japanese forces who have not yet surrendered in order to tell them that the war has ended. AWM P02284.020

Far Eastern operations

Likewise, the principle in the Far East was the same, but every other aspect was different, from the difficulties of navigation to the incredible weather conditions faced and the impossibility of rescue if forced down in the jungle. Lysanders joined No.357 Squadron as late as 1945 supporting Force 136 troops behind Japanese lines, based at Jessore, with the aircraft detached to Meiktila and Mingaladon.

Weather and navigation were major challenges, as well as the enemy, but most Lysanders were lost through damage on landing, strips being sometimes bamboo matting, on other occasions a beach might be used – and rocks were always a hazard. Unlike operations in Europe, the aircrew might be expected to leave their aircraft and wade through swamps to deliver the supplies to the guerrilla unit.

After the Japanese unconditional surrender on August 14th, Lysanders of 357 Squadron were kept very busy ferrying personnel to ensure that the remaining Japanese in Burma were informed of the end of the war. Leaflets were dropped, and Japanese soldiers carried to inform their countrymen; on occasion actually parachuting from the Lysander!¹² Flying Officer Peter Arkell recalls flying a pair of bound Japanese prisoners – they managed to free themselves and luckily Peter managed to land the aircraft before they dived over the side or brought the aircraft down from inside¹³. Recovery of Allied POWs was another unusual post-war task. As late as September and October 1945, Lysanders were still being damaged on landing while undertaking hazardous operations.



Lysander IIIA of 357 Sqn on a makeshift strip in July 1945 at a remote Karen hill village. This and another Lysander have brought supplies to Force 136 based in the village close to Japanese-held territory. In the foreground, strips of bamboo have been laid on the landing strip to enable aircraft to get some grip. Force 136 was a guerrilla unit that reported on the movements of Japanese forces and harassed them whenever possible. AWM P02284.021

Postwar

One original Lysander Mk.IIIA (SD) V9614 was presented to the French people by Viscount Stansgate, the Secretary of State for Air, accompanied by much pomp and ceremony on a very wet day in January 1946 in the courtyard of the Coer d'Honneur des Invalides, Paris. It was attended by a number of dignitaries including the Right Honourable Alfred Duff Cooper, Ambassador to France, and service chiefs of both countries.

What happened to this aircraft is a mystery, as it no longer exists. Given General De Gaulle's antipathy to some aspects of the British, the SOE and SIS, it may not have been a favoured gift.¹⁴

Vincent Auriol, appointed the President of France in 1947, had in fact escaped his homeland in October 1943, not in a Lysander, as is sometimes said, but in one of the often-forgotten Lockheed Hudson pickups. However, the importance of these operations and their pervasive effect on the great and



The ceremonial presentation of V9614 to France. British Pathé/ITN.

the good in France was illustrated: when President Auriol ordered the Hudson (and primarily Lysander) pilots, Wing Commander Hodges and Squadron Leader Wagland, to be invested with the Legion d'Honneur, M Massigli, the French Ambassador in London, turned out himself to have been a Lysander passenger!

Combined Operations

In 1941, Lysanders were part of the initial establishment of 1441 Flight based at RAF Dundonald in Ayrshire. The unit was intended to provide an air component for the development of combined operations: a vital need when the time came to invade Europe. They were part of a mixed bag of aircraft, and it was believed at one stage that the two Lysanders and two Ansons were hindering the development of doctrine and tactics, while also having a negative effect on the morale of the men of the unit. Steps were taken to address this issue, with affiliation of other units to provide specialised support, and the disbanding of 1441 Flight which immediately remustered into 516 Combined Operations Squadron on April 27th 1943. The Lysanders stayed, and were used for smoke laying, as part of the very realistic training and testing being carried out, which cost a number of Hurricane pilots' lives.¹⁵

Health war

When the allies occupied Corsica they discovered a major malarial problem exacerbated by the destruction of the marsh pumping stations by the Germans. Two Lysanders were allocated to No.12 Anti Malaria Control Unit and fitted with hoppers and a dusting rig. One Lysander went unserviceable; the remaining work was carried out by P9191 in a vital but easily-overlooked task¹⁶.

Footnotes

1. Verity, *We landed by Moonlight*
2. Doyle, *Where the Lysanders were*
3. Verity, *We landed by Moonlight*
4. Verity, *We landed by Moonlight*, Appendix F
5. Verity, *We landed by Moonlight*
6. Verity, *We landed by Moonlight*, Appendix F
7. BBC People's War website. U523000
8. Robinson, *Lysander Special*
9. BBC People's War website. A2331631
10. BBC People's War website. A4255580
11. BBC People's War website. A4154627
12. AWM Photo caption P02284.019
13. Flypast, June 2005
14. British Pathe film 2171.09 1946 & Robertson, *Lysander Special*.
15. Combined Operations website
16. Lysander Special, Bruce Robertson
17. Fred Ballam, private correspondence.

Technical

The Lysander described

The Lysander was of conventional 1930s design with some unusual technical features. It was a fixed-undercarriage cantilever high wing monoplane, with a two crew, fully enclosed cabin. It was equipped with a Bristol radial engine driving a de Havilland three blade two-pitch constant speed airscrew. The all metal frame of the wings and fuselage was covered with fabric, except for the nose and the fuselage tailcone. The airframe was unchanged in its essentials throughout production, although there were additions and minor changes as equipment varied.

The fuselage was a classic Warren girder construction: the front section of square section Duralumin tubes, the rear, a break just aft of the observer's cockpit, of seamless steel tubes welded together; the two joined by bolted fitch plates. A rollover section was added to the top. The square profile fuselage frame was built out to an oval section by metal framing and covered by wooden framework with fabric covering. Large wooden-frame fabric-covered sections on the starboard side (only) could be removed for servicing.

The high wing, was of a substantial 'D' section hiduminium main spar and a lighter tubular false rear spar. Canadian production had light metal ribs, early Westland examples having wooden ribs. The wing was braced by a Vee strut to the undercarriage, and the wing was of unusual rhomboid shape, the maximum chord of six feet six inches being at about half span, and resulting in very little interference to the crew's view at the centre section where the chord was three feet six inches. The maximum thickness of the wing also occurred at maximum chord as well. Each wing had two slats which ran along the full length of the leading edge and a single section Handley Page slotted flap on the inboard trailing edge – the inboard flaps and slats being interconnected and operating automatically at the appropriate airspeed or angle of attack. This was the feature unique to the Lysander. Conventional balanced ailerons were on the outer section of the wing. The Lysander was the first fully slots and flap-equipped aircraft to enter service with the RAF. The front half of the wing was metal covered; the rear fabric-clad.

The undercarriage was unusual in having Dowty 1929 patent internally sprung wheels attached to a continuous 'U' section alloy beam, itself attached to the bottom of the fuselage frame. In Westland-built machines this was an immensely strong single piece of Duralumin extrusion, originally imported from Switzerland, and in Canadian Lysanders it was made up of several smaller pieces. The undercarriage legs were clothed with large shaped metal fairings, and each leg did additional duty carrying the mounting and ammunition for the two forward-firing .303 Browning machine guns, landing light and provision for a stub wing on each side which could carry light stores. There was provision

on the Mk.I for an additional light stores carrier under the rear fuselage. The tailwheel was fixed down and was castoring and self centring. The undercarriage legs would flex fore and aft as well as splaying slightly when moving on the ground – a most disconcerting sight at first!

The horizontal tailplane was of variable incidence type and was fitted with conventional elevators. Interestingly, due to trim problems on restored survivor G-BCWL it became apparent that there were two types of tailplanes, the TT versions differing in the tail actuating jack mounting. The vertical tail was fixed and had a statically and dynamically balanced rudder. All three tail surfaces were of roughly triangular section, adding to the distinctive profile of the Lysander.

The Mk.I and Mk.III Lysander were fitted with the conventional Bristol Mercury engine, while the Mk.II had the sleeve valve Bristol Perseus. The engine variation was not intended to give any great performance improvement, but to enable different engine production stocks to be utilised, and performance varied remarkably little. The Perseus-engined aircraft could be distinguished by the lack of teardrop bulges on the cowling, which was also shorter.

Once in service, the Perseus engines showed up a number of serviceability issues in other types, such as with the Blackburn Botha which was using them in much longer sorties than the Lysander's, which were relatively untroubled. However, Bristol Engines were already overloaded with work on the Hercules and Taurus, so the Perseus was a low priority, resulting in the Mercury being reselected for the Lysander Mk.III and Mk.IIIA.

The Mk.IIIA was distinguished from the III and earlier marks by the new mounting allowing a (still inadequate) twin machine gun setup for the observer instead of the single .303 pan fed Lewis. Many Mk.III Lysanders were effectively upgraded to Mk.IIIA by receiving this mount.¹

Modellers and artists are often confused by the mixed structure of the Lysander and similarly-constructed aircraft of that era. Fabric does not show rust; the wear and tear on the panels was usually very minor, although Army co-operation Lysanders were often seen with mud streaking. The surfaces and textures of the metal and fabric on the fuselage was very distinctive, as the surface of the wing was in flight. Close study of both the wartime photographs and our modern shots here is recommended for modellers seeking a credible look.

Experimental & testing

Undercarriage

One of the problems facing air forces in the twilight peace years of the 1930s was the difficulty of bringing heavier, faster aircraft onto grass airfields. Tarmac runways were foreseen, and many experiments, including bomber catapults (or 'accelerators' as they were called at the time) were tried. One route was to lower the weight by area footprint of the aircraft. In 1942 the Dowty company came up with a caterpillar tracked undercarriage for the Lysander, similar to that trialled successfully on a Douglas Boston (which overcame obstacles of up to eight square inches!) but unlike the Boston's, the Lysander example was never fitted to an aircraft.



The shock-absorbing strut trial-fitted to the normal beam. Note the torque link fitted to the bottom of the cylinder to prevent castoring. Westland Archives. Lower: The cannon mounting seen here on K6127, the prototype Lysander, but also re-equipped with a Perseus, making it a Mk.II. Westland Archives.

One confusing Lysander story is the 'out-of-wind landing gear'. It states that a Lysander was fitted with a castoring undercarriage, to enable the aircraft to face into wind while travelling on the ground in a different direction while landing – rather like a shopping trolley or cart. Test pilot Harald Penrose recalled the testing of this gear in 1938:

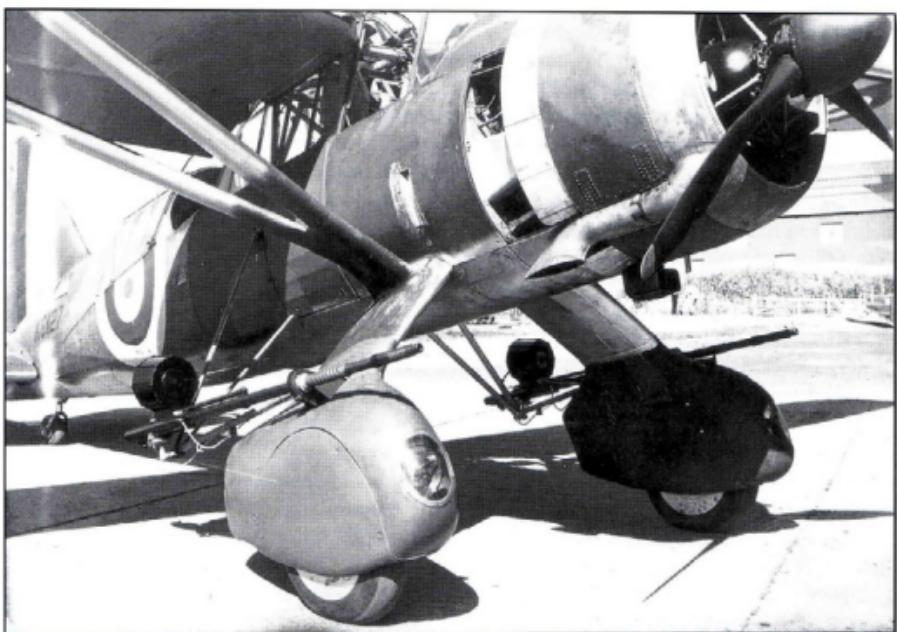
"The Dowty internally sprung wheel was modified to give castoring by means of an ingenious cam mechanism, and a normal external long-stroke oleo leg was substituted for the original springing. It was considered that an aircraft fitted with such an undercarriage might find very valuable application in warfare, since it could be landed on Continental roads irrespective of wind direction."

However, the photograph (see left) often used to illustrate this was taken later than Penrose's recollection, and may be a completely different experiment. A Lysander was fitted with Dowty 'Liquid Spring' shock absorbers between the standard internally sprung wheel and the undercarriage beam, but it did not castor or turn. The intent was to increase the shock absorption properties as the Special Duties squadrons had found their aircraft suspension bottoming out in the rough field landings. The full story (or stories) are yet to be untangled.²

The General Aircraft Ltd GAL-56 experimental glider used Lysander mainwheel units in combination with a Bristol Bisley tailwheel. The aircraft proved to be highly dangerous and a dead end.

Cannon & strafing

With the German occupation of the continent, thoughts turned to emergency defensive aircraft of varying degrees of merit. Lysanders, along with other even



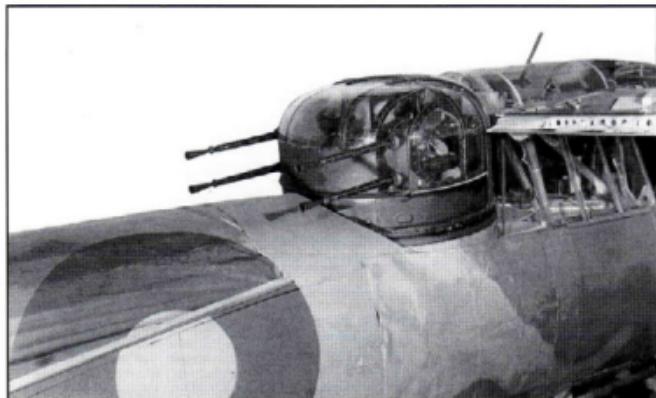
less suitable aircraft (such as Tiger Moths), were patrolling likely areas looking for the German invasion force, prepared to attack such forces with whatever weapons that could be brought to bear. Their puny armament in this unexpected task obviously got a lot of brains thinking, and the result was a range of unusual upgrades - some so unusual as to be positively strange, such as the Delanne or tandem-wing Lysander and the 'Pregnant Perch'.

Cannon

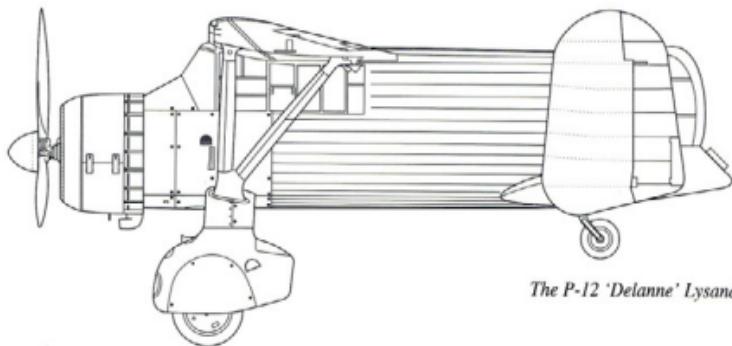
Several Lysanders (prototype K6127, L4673, L4674 as well as P1687, 'UG-A' have been quoted³) were equipped with the standard RAF 20mm Hispano, complete with 60-round drum, attached outboard of the landing gear, at the stub wing attachment points. This was an emergency measure to attack any German tanks which might land in an invasion. Aircraftsman First class Bob Norris⁴ of No.4 (AC) Squadron recalled being sent cannon while the unit was still in France, before the German invasion: "...some lethal-looking cannon arrived to be fitted to home made struts on the Lysanders. And, to keep us in mind of the chaos, the bullets never did arrive." Interestingly, it appears that some conversion kits were sent to the Middle East, but what happened to them is not known.⁵ This modification resulted in a comment in the Pilot's notes referring to the 'Cannon fire button' - no doubt puzzling more than one pilot as he looked in vain for this beefy armament.

Delanne

In the attempt to create an effective anti-invasion ground strafing, a Boulton Paul Type A Mk.III turret was fitted in the observers' position in a mock up (on P1723), but it was realised that both centre of gravity and field of fire issues ruled out this idea. However, this led to the next idea, due to a connection with the Frenchman Maurice Delanne. Petter quickly worked up a design after he and Penrose had visited Maurice and tried the Delanne 20T in France, incorporating wind tunnel test data. Harrington's, a Hove coachbuilder, produced the rear wing and fins, while Westland modified and shortened K6127, the prototype's

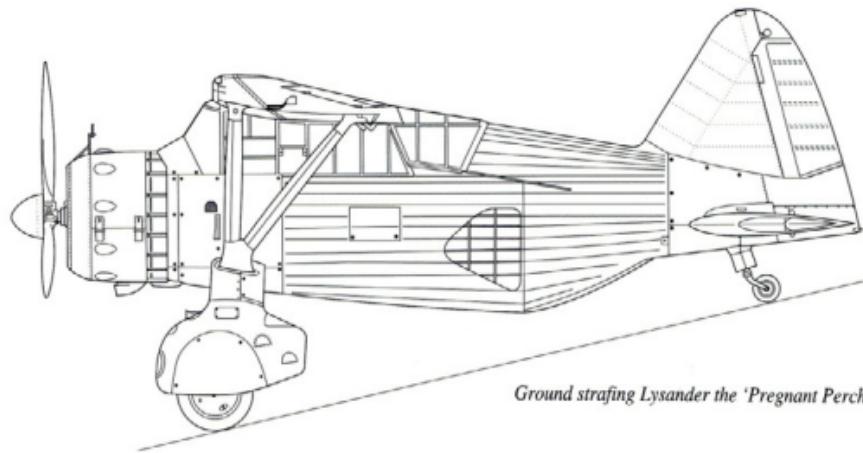


The Boulton-Paul Type A Mk.III turret mocked up in the observer's position in the Westland works. The unconvincing covering is due to the use of a light fabric or maybe paper painted to make it look complete. Westland Archives

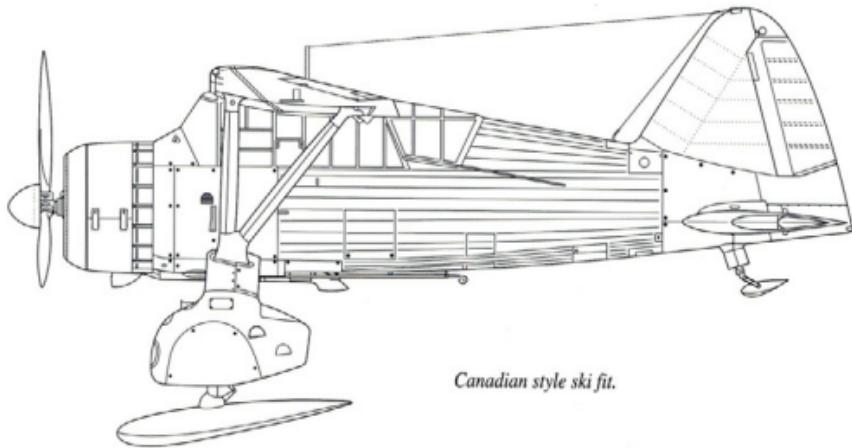


The P-12 'Delanne' Lysander

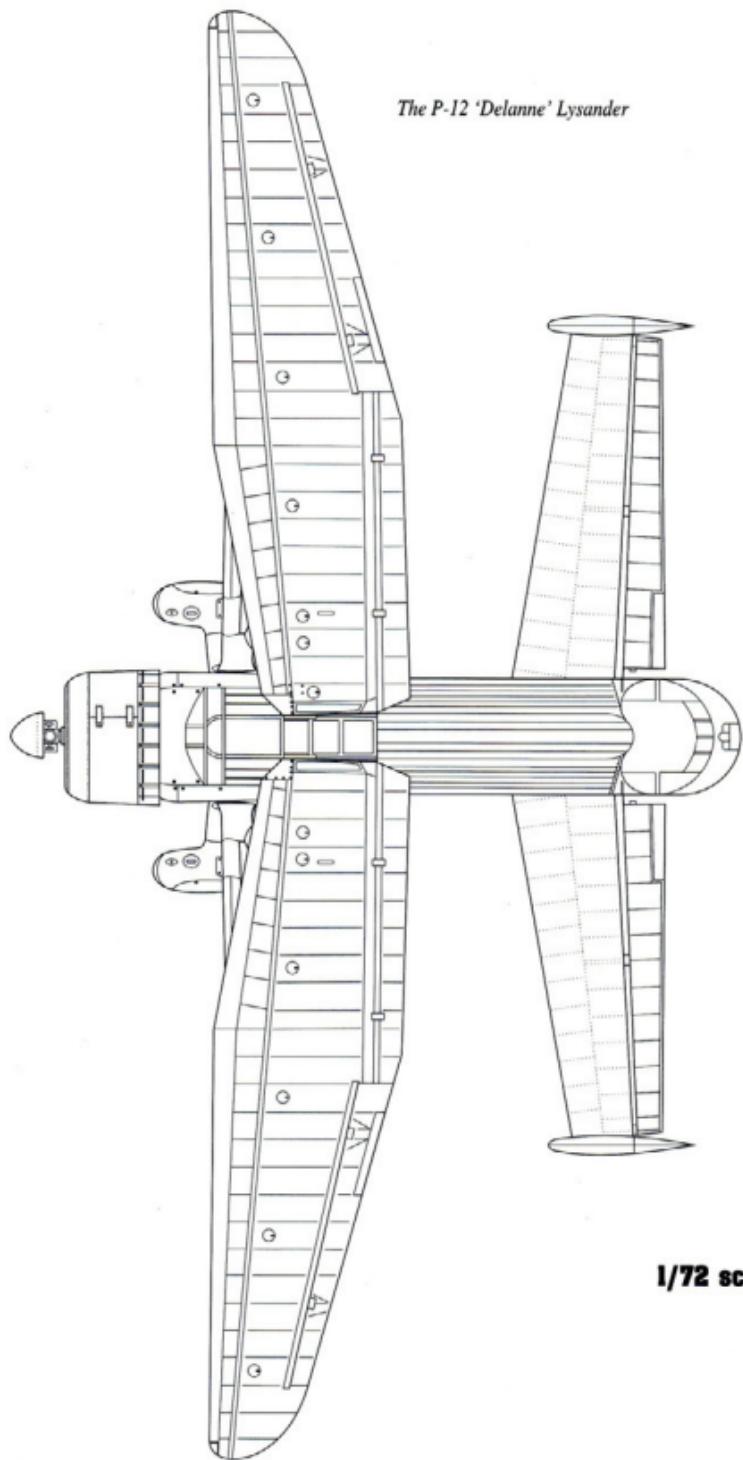
1/72 scale



Ground strafing Lysander the 'Pregnant Perch'



Canadian style ski fit.



The P-12 'Delanne' Lysander

1/72 scale



A good side view of the P-12 'Delanne' Lysander illustrating that even the Lizzie's unique shape can be made even more unusual. IWM



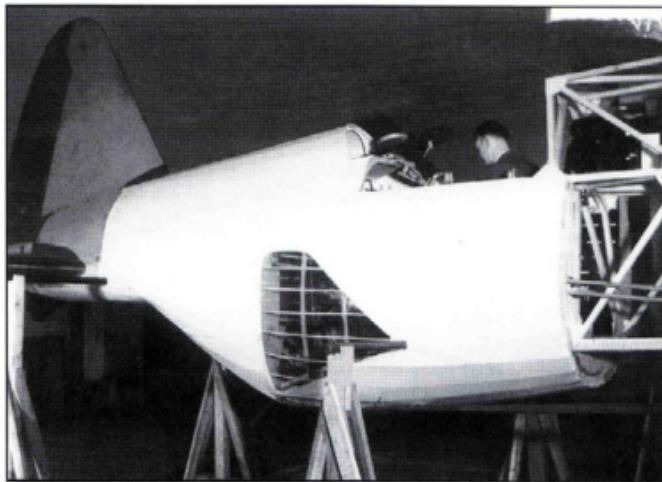
fuselage. The objective was to carry a four-gun power-operated turret in the tail. The works took a year, and took its first flight on 27th July 1941; the aircraft, designated the P-12, "handled very well" in the opinion of Harald Penrose, who looped the aircraft on its first flight! Only a dummy turret and ballast was ever fitted as the proposal was abandoned before a real turret and gunner could be fitted, and the electric and hydraulic power connections had not been included. The field of fire would have been exceptional, but only after the aircraft had flown over its target, allowing the enemy on the ground to get his blow in first. The wide centre of gravity range of this configuration was of great interest, and the A&AEE explored the aircraft's handling extensively, before it went to the RAE and was struck off charge in 1944.

Pregnant perch

The third, and least effective, concept of ground strafer was nicknamed 'the pregnant perch' and consisted of the first production Lysander, L4673, with the fuselage reshaped to allow a ventral aft-firing two gun position. Here the gunner would have been hard pressed to see the target before firing, as well as the previous objection to the Delanne concept which still applied here. The aircraft was damaged despite a very skilful forced landing by the pilot, George Snarey, in June 1940, and again interest withered before repairs seemed worthwhile.

Opposite page, top: A view of the Westland P-12 'Delanne' Lysander in flight at Yeovil. Though this layout seems odd to us, it is a very viable configuration aerodynamically – but of little use for the ground strafing job. Westland Archives. Middle and bottom: Two views of the P-12. A real turret was never fitted, but the difference between the fuselage cross-section and turret shape is obvious at this angle. A gunner moving a turret and guns side to side into the slipstream would have had some effect on the stability of the aircraft as a gun-platform. RAF Museum, P6125 & Westland Archives.

Top: The pregnant perch mock-up in the Westland factory. Despite its minimal utility, a flying version was constructed as well. Westland Archives.



Bottom and opposite: Three views of the Lysander used to test out the Blackburn Steiger wing. Conventional seeming, it was a very unusual lifting surface and was controlled by spoilers on the wing tip upper surface. RAF Museum P6129, P6130 and P6131.

In summary, in the opinion of the author, it is difficult to think of a more bizarre and useless set of time-wasting experiments on a successful production aircraft. Even on paper all would have been pretty much useless, though some use may have been found for the Delanne concept. One has to wonder why Westland's energies were not better applied – to the Whirlwind for example.

Wing changes

Blackburn Steiger

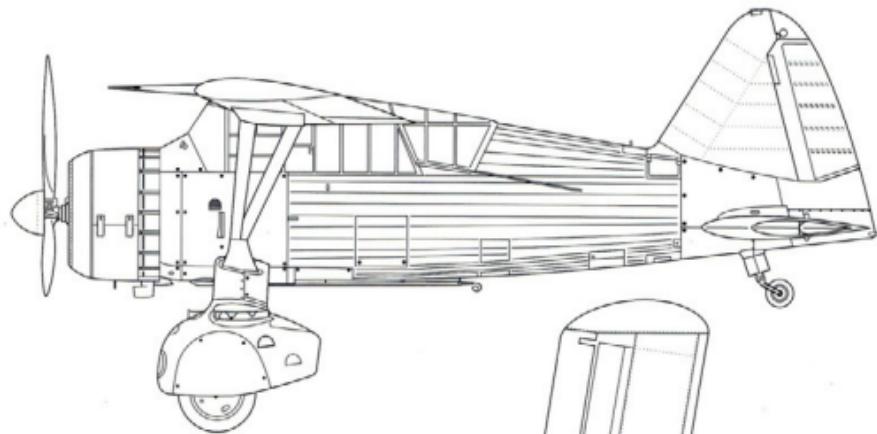
Lysander Mk.II P9105 was chosen as a flying test bed for a Blackburn Steiger high lift wing in 1941. This was a more conventional looking wing,



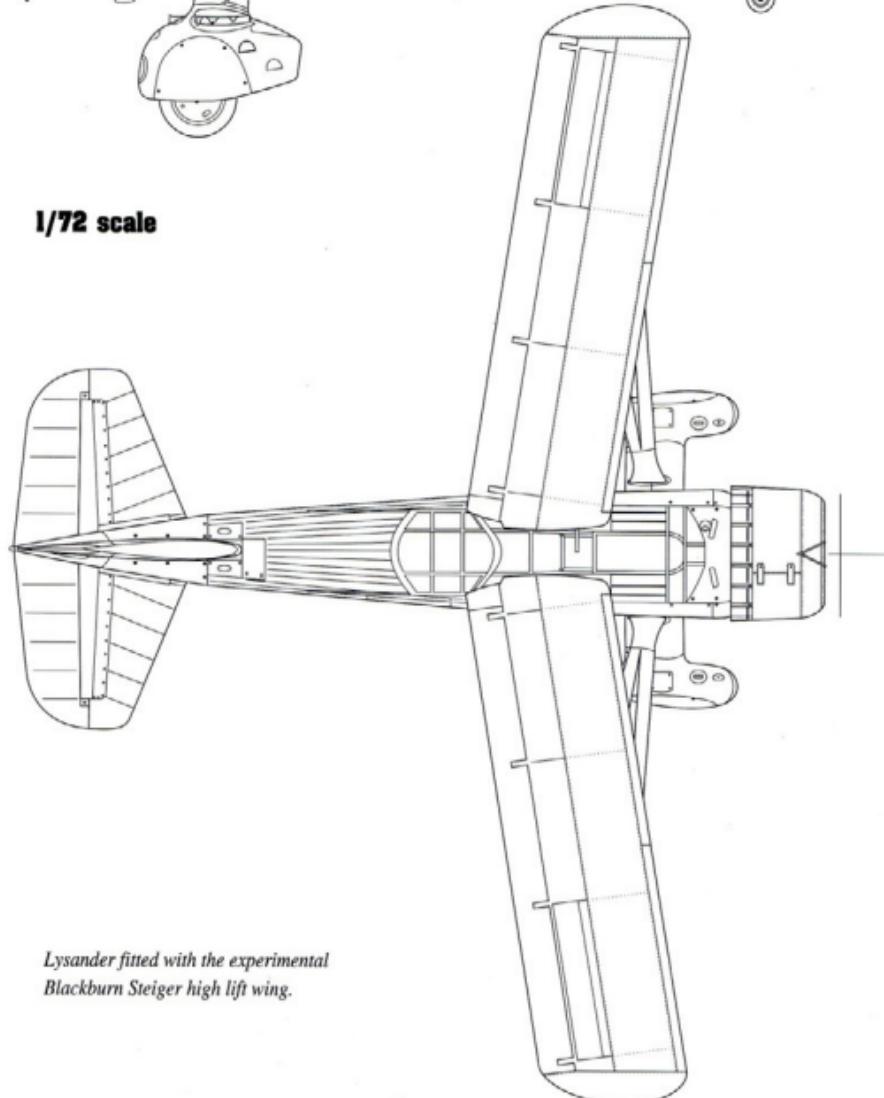


of parallel chord, though slightly forward-swept (8 degrees) and of only 38ft (11.58m) span. Closer examination reveals full length leading edge slats and also, unusually, full length trailing edge flaps. Roll control was achieved by spoilers near the tips.

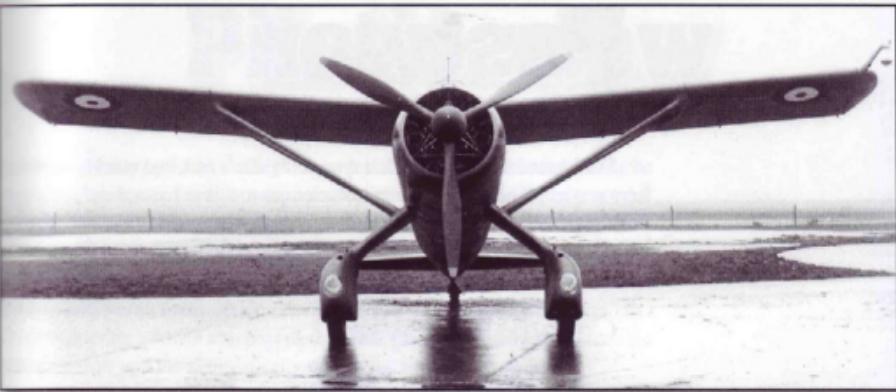




1/72 scale



*Lysander fitted with the experimental
Blackburn Steiger high lift wing.*



Bench dive brakes

Another (Mercury engine) Lysander was provided with bench type airbrakes, but despite photographs of it, there appears to be no information as to why it was done. It is probable that the Lysander was acting as a test bed, rather than the fitment being regarded as a Lysander improvement.

Footnotes

1. Bowyer, *Air Pictorial*.
2. James, *Westland Aircraft since 1915*
3. Ovcacik, *M Westland Lysander*, 4+
4. BBC People's War website. A2358038
5. Williams, *private correspondence*

Top: Another angle on the Blackburn Steiger wing equipped Lysander. Note the complex pitot tube and spring-loaded airspeed plate on the port wingtip. RAF Museum P6132

Bottom: A photograph of the dive-brake equipped Lysander. No documents appear to have survived to explain this modification's objective. Westland Archives.



Postwar

The Lysander was an obsolete type at the war's end, and quickly vanished from service. There were a couple of attempts to utilise Lysanders for civilian purposes, but only one organisation in Canada managed to find work for the type.

Canadian sprayers

Four Lysanders were put on the civil register by Westland Dusting Service/Westland Spraying Service, of Edmonton (later High River) Alberta in 1948, where they were used for agricultural spraying. Jerry Vernon recalls: "I understand they stopped it when they realized what dangerous stuff they were using. I heard that one of their pilots later died from the long-term effects of ingesting the spray materials. They ceased operations, and the aircraft were scrapped."

The Lysanders were

Mk.II CF-DGI-X RCAF 451

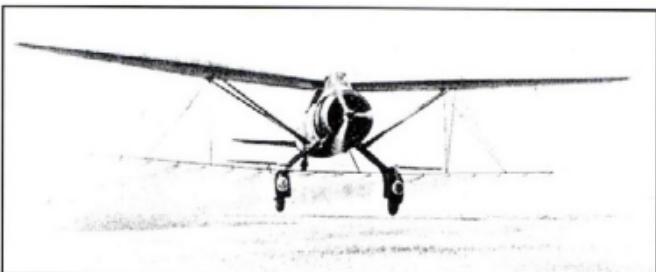
Mk.II CF-DRL RCAF 433

Mk.III CF-FOA RCAF 2382 c/n 1223

Mk.III CF-GFJ RCAF 700 (ex-RAF R2047)

The main fuselage tank (95 gallons) was used for the spray material, while a smaller fuel tank (45 gallons) was fitted in the centre section behind the cockpit, and spray booms were added. There are a couple of photos of a Lysander with a spray rig attached, working a field. CF-FOA, for instance, was registered until 1955, after which it was recorded as having been scrapped and used as landfill.

*Although poor quality, this photo shows one of the Canadian sprayers, recorded as CF-FOA, seen here in action with the spray rig visible below the wings.
James Kighly Collection.*



Pilot's view

Wartime ferry pilot H. A. Taylor recalled; "...the Lysander might fairly be described as an interestingly schizophrenic affair. When treated as a normal aeroplane it behaved more or less as such; when required, by short field circumstances or at the whim of a test-pilot to provide a passable imitation of an Autogiro it became an entirely different, and even, if not handled firmly, occasionally recalcitrant device. The basic reason for this Jekyll and (mildly) Hyde behaviour – which also provided a better-than 4:1 speed range – were the full span slots and the automatically-operated flaps..."

"It was a relatively simple aeroplane, with not much more than the two-pitch propeller and fore-and-aft trim to worry about in the way of vital action drill, and you could map-read your way comfortably along in weather conditions which would be harassing, to say the least, when delivering a Hurricane or Spitfire with limited downward fields of view."

Pre-Flight

Andy Sephton, Chief Pilot of the Shuttleworth Collection, took over Lysander G-AZWT from John Romain of ARC. Andy recalls: "Walking out to the machine was the first time I'd taken a good look at her. My first impression was one of size; she was big. A cockpit check was necessary before walkround, but how do I get up there? John came to the rescue, showing me where the

This view of the Lysander with a Spitfire Mk.V in the background clearly shows how good the Lysander pilot's view was, both over the noise and above and below the wing in comparison to fighters of the era. James Kightly.



footsteps were and demonstrating a neat change of foot rest half way up to prevent arriving at the top of the stairs with crossed legs.”^b

Darryl Stinton, pilot of G-BCWL in the 1980s observed this problem with even more wry humour: “One can end up facing backwards in the cockpit, like getting onto a horse the wrong way. This can be turned to advantage because it gives a good close up view of the upper surfaces of the wings and slats, and you can read the non-standard gauge on the 95 gallon fuel tank behind the pilot’s seat. Check that the inboard slats are free and that both flaps go down when they [the slats] are pulled forward.”^c

Take-Off

The Pilot’s notes state: “A steep angle of climb can be obtained by climbing at 70 mph or even down to a minimum of 60mph – this is an emergency operation and should only be performed if necessitated by operational considerations. If engine failure occurs while climbing at this speed, the nose must be pushed down instantly, otherwise at least 600 feet will be lost before control is regained.”

Andy Sephton said of this and the other prohibitions in the pilot’s notes: “I know I’ve never read such warnings before in the Pilot’s Notes of an aircraft in service. Comments like these are more at home in a critical report following an unsuccessful test flight!”

Andy added; “The engine is powerful for an aircraft of this size. This leads to a high-energy propwash which flows over the tailgroup and markedly increases the efficiency of the tailplane at high power. Consequently, although the aircraft’s speed is about the same on take-off and landing, the position of the tailplane is fully up (leading-edge down) with the engine off (landing), and almost fully down (leading edge up) when the engine is producing high power (take-off). If the tailplane is set in the wrong position for take-off, even with full-forward control column, an uncontrollable pitch-up would occur. Given the twenty-odd applications of tail trim to move from one extreme to the other, it is unlikely that the aircraft would survive this mistake.”^d

Back in the war, the pilots had other concerns: 161 Sqn pilot Hugh Verity recalled his first operation after much practice. This time he had lots of fuel, a ‘Joe’ in the back and was about to be flying at night. “Before getting take-off clearance I muttered to myself ‘TMP fuel and gills’ checking that the tail actuating wheel was set for TAKE-OFF, the mixture control in NORMAL and the pitch control pushed in for fine pitch. The fuel gauges were all reading full because it was to be a seven-hour trip. The gills were open to increase the airflow over the engine. At 20:20 hours, I turned onto the long flarepath, eased the throttle fully open and took off. When I was at the safety speed of 80mph, I eased the stick back and climbed away, turning onto my first heading...”^e

Handling

Korean War pilot Dwight Brookes of California had Lysander N7791 restored to flight in California. Despite the challenges of this restoration of an

alien aircraft thousands of miles from its origin, Dwight enjoyed the challenge. He recalled the first flight:

"Passing through 7,000 feet everything was pretty well stabilised and the view, I noticed for the first time, was unbelievable. Just like 'Cinerama'... I had left the side windows down and the top sliding canopy open just in case and the air was getting cooler now... And then I noticed for the first time that I had been trimming all the time and never realised it. The 18 Lysander pilots who had visited the restoration site had all told me about this and they were right. The Lysander is sensitive to trim and it needs the floating elevator. There are no trim tabs, as such, on the airplane."¹⁷

Special Duties pilot Peter Vaughn-Fowler noted another idiosyncrasy; "Another similar wheel on the right side raised and lowered the seat. This could cause embarrassment at times; if dive bombing was being carried out and the seat was not in the fully up position, you found yourself plummeting to the bottom of the cockpit when high G-forces were applied."¹⁸

Likewise wartime Lysander pilot Robert Kronfield remembered; "In the air the Lizzy was extremely manoeuvrable and at low speeds could be turned on a postage stamp: the top speed, in excess of 230mph, was faster than some of the single seaters in service use at the time of its conception and a comfortable 180mph cruise could easily be maintained."¹⁹

Ferry pilot H. A. Taylor wrote; "...the slots and flaps did not, as one might have expected, come into action when pulling out of a dive, or, except at very low speeds, in tight turns. Some of the earlier production Lysanders had a cockpit-operated slot/flap locking device to guard, no doubt, against this prospectively dangerous possibility. This was later deleted...."²⁰

Andy Sephton shows the correct method of boarding the aircraft. James Kightly.



This photo clearly shows the landing attitude of the Lysander, just before a three-point textbook touch-down - the slats deployed and automatic interlinked flaps down, as well as the full tail-down trim of the all moving tailplane. It is also clear that the elevators would not be able to overcome the angle of attack of the tailplane if full power was suddenly applied.

Nick Blacow.

Test pilot Andy Sephton casts a more modern, test pilot's analytical eye over the controls: "The aircraft was found stable, and easy to fly, but the elevators and to some extent the ailerons were heavy. It would not have mattered too much for the long transits of the Special Operations role, but Army Co-operation must have been hard work."

On the slats and flaps, Andy adds: "...it is a remarkable system. The wing changes shape as required to provide the pilot with the most efficient wing profile for the ambient flight conditions. What's more it is achieved by good aerodynamics and not digits as we have to do today.... More importantly, the pilot can never forget to lower the flaps for landing, not can he forget to retract them before the limiting speed is reached after take-off."

Illustrating some of the challenges in getting the operation of vintage aircraft right, John Romain of ARC tells a couple of interesting stories: "Over the last twenty years, four Lysanders have been restored to flying condition, but all have suffered from engine problems that limited their flying to only a few hours. At least three also suffered from longitudinal trim problems that, along with engines that ran roughly or unreliably, led their pilots to feel the aircraft was not as desirable as history would have them believe."

John then described how ARC's expertise on the Mercury engine led to ARC being asked to "sort out" Brian Woodford's Lysander; "The initial test flights highlighted a very heavy tail-down load during cruise flight that could not be trimmed out. A look through the aircraft's records confirmed that this had been apparent since its restoration and was considered 'normal' even though it required constant forward pressure on the stick to fly straight and level! After considerable research, it was discovered that the tailplane-actuating jack had



been fitted with a late bracket style that gave the wrong range for the type of tailplane fitted. It was only after a retired gentleman donated his notes to ARC that it was discovered that Lysanders used in the target-towing role had different tailplanes. With the correct bracket fitted, the trim system was perfect and the aircraft now flies as it should.^m

Correct ballast was important, as H. A. Taylor recalls; "On this occasion a rigger decided to come along for the ride and I failed to check that the equivalent ballast had been removed. The five-minute circuit was an exceptionally unpleasant one; with minimum power and full forward trim the nose could only be held down with all the two handed pressure on the stick which I was capable of applying."ⁿ

Peter Vaughn-Fowler was able to use the armament: "The fixed front guns, which were mounted one in each of the undercarriage spats, were temperamental. I don't believe anyone ever achieved a completely empty ammunition tray. These were in the fuselage immediately below the pilot and the ammunition was fed down the ammunition struts to the guns. This always led to a jam after a few bursts."^o

Unlike the other airworthy Lysanders, the Shuttleworth machine has been fitted with a (dummy) long range tank, as well as an external ladder. Andy Sephton; "Both combine to reduce lateral stability to the extent that the aircraft wanders excessively in yaw. However, the maximum speed achievable in level flight is not much different to that without the tank, owing to the higher engine power and (I suspect) the relatively high drag of the rest of the aircraft. ... Yaw stability is low with the tank and good without it."^p

Landing

Dwight Brookes says of his first landing; "Base to final was normal, but she didn't want to come down. At 90mph the outboard slats deployed and, after re-trimming, the inboards deployed at 55mph. We held this until it was obvious we could make the field. I levelled off high and dropped it in carefully as 'Fish' [his flight observer, Lockheed test pilot 'Fish' Salmon] had requested before the flight. Lysanders are landed in a three-point attitude because of the weight and short moment of the airframe design. They like to nose over if one is not careful, but the touchdown was normal and we stopped in 800 feet and taxied in."^r

Andy Sephton observes; "During training all pilots are taught that it is dangerous to reduce speed to lose height on the approach. This is because a normal aircraft approaches at a relatively small margin above stall speed – and a stall at such a low altitude could be catastrophic. As we have seen, this is not so with the Lysander. A normal Lysander approach is carried out at twice the stall speed, so there is a more than adequate safety margin to carry out such a manoeuvre."^s

Sqn Ldr. Robert Kronfield collected 'his' aircraft from Harald Penrose personally. Reflecting on the short-field performance, he said; "These spats...also housed the powerful landing lights that were diagonally adjustable from the cockpit. The landing lights were indeed a joy to use, as the spats were constantly in view and one could literally inch the wheels down onto the ground on the darkest night without the assistance of any other external aid.

A trick effect was also obtainable by keeping the speed down to about 50mph and holding the stick firmly back; the throttle was then manipulated between the half and quarter open position and the Lizzy would come down like a lift. The last manoeuvre did, however, require considerable skill, as at not less than 25 feet, full throttle had to be applied and the stick eased forward a fraction at the same time and faulty timing could, and sometimes did when executed by the inexperienced, result in the undercarriage doing the splits to the accompaniment of expensive noises.

"This spectacular type of descent was only used in extreme emergencies as normally in any sort of wind with gentle use of the very efficient pneumatic brakes my own landing run seldom exceeded 160 yards (146 metres) and in a moderate breeze using the automatic boost control cut out I have actually taken off in 36 yards (33 Metres)."

Footnotes

- a HA Taylor, *Air Enthusiast*, July 1972
- b Andy Sephton, *Propswing, the SVAS Journal*, Winter 1998.
- c Darryl Stinton, *Vintage Aircraft 19*, Jan-March 1981.
- d Andy Sephton, *Pilot*, May 2003
- e Hugh Verity, *We Landed by Moonlight*, page 17.
- f Dwight Brookes, *Air Classics Vol.11, No.1*, Jan 1975
- g Group Captain Peter Vaughn-Fowler, *Royal Air Force, the Aircraft in Service*, Temple Press.
- h Sqn Ldr Robert Kronfield, *Air Classics Vol.11, No.1*, Jan 1975
- i HA Taylor, *Air Enthusiast*, July 1972
- j Andy Sephton, *Propswing, the SVAS Journal*, Winter 1998.
- k Andy Sephton, *Pilot*, May 2003
- l John Romain, *Flight Journal*, June 2000
- m HA Taylor, *Air Enthusiast*, July 1972
- n Peter Vaughn-Fowler, *Royal Air Force, the Aircraft in Service*, Temple Press.
- o Andy Sephton, *Pilot*, May 2003
- p Dwight Brookes, *Air Classics Vol.11, No.1*, Jan 1975
- q Andy Sephton, *Pilot*, May 2003
- r Sqn Ldr Robert Kronfield, *Air Classics Vol.11, No.1*, Jan 1975

Lysander Units & codes

Note: This is a list based on various sources and photographs, of RAF or Dominion units only, and includes units exclusively equipped with Lysanders and others with only flights or a few Lysanders on strength.

Unit	Duty	Code
1 Sqn Indian Air Force	Army co-op.	NB
2 Sqn	Army co-op.	KO
2 Sqn Indian Air Force	Army co-op.	-
2 Sqn RCAF	Army co-op.	AE
3 Sqn Indian Air Force	Army co-op.	-
4 Sqn	Army co-op.	TV (FY after 03/09/39)
4 Sqn Indian Air Force	Army co-op.	-
6 Sqn	Army co-op.	JV
13 Sqn	Army co-op.	AN (OO after 03/09/39)
16 Sqn	Army co-op.	KJ (UG after 03/09/39)
20 Sqn	Army co-op.	HN
24 Sqn	Communications	-
26 Sqn	Army co-op.	HL (RM after 03/09/39)
28 Sqn	Army co-op.	BF
81 Sqn	Communications	-
110 Sqn RCAF	Army co-op.	SP
111 Sqn RCAF	Army co-op.	-
112 Sqn RCAF	Army co-op.	AE
116 Sqn	AA Calibrations	II
118 Sqn RCAF	Army co-op.	VW
135 Sqn	Army co-op. / Air defence	-
138 Sqn	Special Duties	AC
139 Sqn	Bomber	-
148 Sqn	Special Duties	FS
161 Sqn	Special Duties	MA later JR
173 Sqn	Communications	-
208 Sqn	Army co-op.	RG
225 Sqn	Army co-op.	LX
231 Sqn	Army co-op.	VM
237 Sqn	Army co-op.	-
239 Sqn	Army co-op.	HB
241 Sqn	Army co-op.	RZ
267 Sqn	Communications	KW
268 Sqn	Army co-op.	NM
275 Sqn	Air-Sea Rescue	PV

Unit	Duty	Code
276 Sqn	Air-Sea Rescue	AQ
277 Sqn	Air-Sea Rescue	BA
278 Sqn	Air-Sea Rescue	MY
280 Sqn	Air-Sea Rescue	MF
285 Sqn	AA co-op	-
287 Sqn	AA co-op	KZ
288 Sqn	AA co-op	-
289 Sqn	AA co-op	-
309 Polish Sqn	Army co-op.	AR
357 Sqn	Special Duties	-
400 Sqn RCAF	Army co-op.	SP
414 Sqn RCAF	Army co-op.	RU
510 Sqn	Communications	-
516 Sqn	Army co-op.	-
598 Sqn	AA co-op.	-
613 Sqn	Army co-op.	-
614 Sqn	Army co-op.	LJ/YX
754 NAS FAA	TT Training	-
755 NAS FAA	TT Training	W6
3 & 32 OTU RCAF	Training	GV
10 OTU	Training	UY
16 OTU	Training	GA
17 OTU	Training	AY
18 & 28 OTU	Training	VQ
19 OTU	Training	XF
54 OTU	Training	YX
-	School of Army Co-op	LX
1 AACF Flight	Anti-Aircraft Coop (Later 116 Sqn)	-
419 / 1419 Flight	Special Duties, later 138 Sqn	-
1403 Flight	Meteorology	-
1441 Flight	Combined Ops (later 516 Sqn)	-
1433 Flight	Army Co-op	-
1486 – 1493 TT Flights	Training	-

Westland Lysander	Mk.I	Mk.II & Mk.II TT	Mk.III & Mk.IIIA & Mk.III.TT & Mk.IIIA.TT		Mk.III (SD)
Engine	Bristol Mercury XII	Bristol Pegasus XII	Bristol Mercury XX or 30	Bristol Mercury XX or 30	Bristol Mercury XX or 30
Engine Power	890 hp 664 kw	905 hp 674 kw	870 hp 648 kw	870 hp 648 kw	870 hp 648 kw
Propeller	de Havilland three blade two pitch of 11 ft (3.35 m)	de Havilland three blade two pitch of 11 ft (3.35 m)	de Havilland three blade two pitch of 11 ft (3.35 m)	de Havilland three blade two pitch of 11 ft (3.35 m)	(Later aircraft: de Havilland three blade constant speed of 11 ft (3.35 m))
Max Speed Sea Level	211 mph 339 kmh	206 mph 331 kmh	209 mph 336 kmh	209 mph 336 kmh	-
Max speed at 10,000 ft	219 mph 352 kmh	230 mph 370 kmh	207 mph 333 kmh	207 mph 333 kmh	-
Max Permissible Dive Speed	300 mph 483 kmh				
Cruise	150 mph 241 kmh	- -	- -	- -	165 mph 265 kmh
Min speed (Engine on)	54 mph 87 kmh	54 mph 87 kmh	56 mph 90 kmh	56 mph 90 kmh	56 mph 90 kmh
Range	600 miles 965 km	600 miles 965 km	600 miles 965 km	600 miles 965 km	900 miles (1,484 km) later 1,100 miles (1,770 km) approx.
Endurance	3.5 hours	3.5 hours	3.5 hours	3.5 hours	Circa 8 hours.
Take-off run to unstick	165 yds 150.8 m	165 yds 150.8 m	165 yds 150.8 m	150.8 m	600 yds (548.6 m) with 4 passengers, 300 yds (274 m) normal load
Take off run to clear 50 ft (15.24 m) obstacle	230 yds 210 m	245 yds 224 m	305 yds 278 m	-	-
Service Ceiling	26,000 ft 7,920 m	26,000 ft 7,920 m	21,50 ft 6,553 m	-	-
Empty Weight	4,044 lb 1,834 kg	4,160 lb 1,886 kg	4,365 lb 1,980 kg	-	-
Loaded Weight			6,318 lb 2,865 kg	-	-

Max Take-off weight	5,920 lb	2,685 kg	6,030 lb	2,735 kg	6,330 lb	2,871 kg	10,000 lb	4,536 kg
Fuel	95 gallons	432 litres	95 gallons	432 litres	95 gallons	432 litres	95 gallon tank + 150 gallon tank	432 litre + 68 litre
Oil	9 gallons	40.9 litres	9 gallons	40.9 litres	9 gallons	40.9 litres	9 gallons + 18 gallon tank	40.9 litres + 81.8 litres
Armament (Defensive)	2 x Browning .303 machine guns, + 500 rpg.	2 x Browning .303 machine guns, + 500 rpg.	2 x Browning .303 machine guns, + 500 rpg.	2 x Browning .303 machine guns, + 500 rpg.	2 x Browning .303 machine guns, + 500 rpg.	2 x Browning .303 machine guns, + 500 rpg.	Some retained Mk.IIIA armament, but no gun in rear cockpit, others had none.	
	1 x Lewis .303 or VGO .303 in rear cockpit	1 x Lewis .303 or VGO .303 in rear cockpit	1 x Lewis .303 or VGO .303 in rear cockpit	1 x Lewis .303 or VGO .303 in rear cockpit	2 x Browning .303 in rear cockpit ('A' Suffix aircraft)	2 x Browning .303 in rear cockpit ('A' Suffix aircraft)		
	Bombs carried on stub wings. Alternate loads:	Bombs carried on stub wings. Alternate loads:	Bombs carried on stub wings. Alternate loads:					
	4 x 112 lb (50.8 kg) Mk.VII HE	4 x 112 lb (50.8 kg) Mk.VII HE	4 x 112 lb (50.8 kg) Mk.VII HE	4 x 112 lb (50.8 kg) Mk.VII HE	4 x 112 lb (50.8 kg) Mk.VII HE	4 x 112 lb (50.8 kg) Mk.VII HE		
	4 x 120 lb (54 kg) GP bombs	4 x 120 lb (54 kg) GP bombs	4 x 120 lb (54 kg) GP bombs	4 x 120 lb (54 kg) GP bombs	4 x 120 lb (54 kg) GP bombs	4 x 120 lb (54 kg) GP bombs		
	2 x 250 lb (113 kg) GP bombs	2 x 250 lb (113 kg) GP bombs	2 x 250 lb (113 kg) GP bombs	2 x 250 lb (113 kg) GP bombs	2 x 250 lb (113 kg) GP bombs	2 x 250 lb (113 kg) GP bombs		
	12 x 20 lb (9 kg) HE bombs	12 x 20 lb (9 kg) HE bombs	12 x 20 lb (9 kg) HE bombs	12 x 20 lb (9 kg) HE bombs	12 x 20 lb (9 kg) HE bombs	12 x 20 lb (9 kg) HE bombs		
	12 x 25 lb (11.3 kg) incendiary bombs	12 x 25 lb (11.3 kg) incendiary bombs	12 x 25 lb (11.3 kg) incendiary bombs	None				
Armament (offensive)	Plus 4 x 25 lb (11.3 kg) incendiary bombs on rear fuselage rack	Plus 4 x 25 lb (11.3 kg) incendiary bombs on rear fuselage rack	Plus 4 x 25 lb (11.3 kg) incendiary bombs on rear fuselage rack	Plus 4 x 25 lb (11.3 kg) incendiary bombs on rear fuselage rack	No rack	No rack		

Lysander production batches & serials		
Mk.I		
2 prototypes: K6127, K6128		2
L4673-L4738 [Includes L4731-L4733 - cancelled Portuguese order]		66
P1665-P1669		35
R2572, R2575-R2600, R2612-R2652		68
	Total Mk.I:	189
Mk.II		
L4739 – L4816		78
L6847-L6888, N1200-N1227, N1240-N1276, N1289-N1320, P1711-P1745		174
P9051-P9080, P9095-P9140, P9176-P9199		100
R1987-R2010, R2025-R2047		47
	Total Mk.II:	517
Mk.III		
R8991-R9030, R9056-R9079, R9100-R9135, T1422-T1470, T1501-T1535, T1548-T1590, T1610-T1655, T1670-T1709, T1735-T1711		350
W6939-W6945, W6951-W6960		17
Mk.IIIA		
V9280-V9329, V9347-V9386, V9401-V9450, V9472-V9521, V9538-V9557, V9570-V9619, V9642-V9681, V9704-V9740		347
TT Mk.IIIA		
V9751-V9753, V9775-V9824, V9844-V9869, V9885-V9906		100
	Total Mk.III:	964
	Overall Total:	1672

Foreign Production		
[Note: This does not include aircraft diverted from RAF stocks.]		
Mk.I		
Finland	L4678, L4681, L4682, L4703 became LY123 – LY126.	4
Egypt	Y500 – Y517	18
Mk.II		
France	01	1
Ireland	P61-66 (61 & 66 Mod to TT.Mk.II)	6
Turkey	3101-3136	36
Canadian built	416-490	75
Mk.III		
Canadian built	2305-2454 Built as Mk.IIIA TT	150

Aircraft Transferred

To BOAC for training	T1443, T1739
To Canada as 1536	V9477
To Canada, RCAF 700	R2047 (Postwar CF-GFJ)
Canadian civil use	433 - CF-DRL, 451 - CF-DGI-X, 2383 - CF-FOA, R2047 - CF-GFJ
To Egyptian Air Force as Y518, L9000	R2650, L9000
To Finland as LY114-LY122	R8991-R8999
To Fleet Air Arm	T1445, T1570, T1576, V9295, V9303, V9349, V9360, V9372, V9384, V9410, V9497, V9511, V9574, V9600, V9654, V9662, V9663, V9667
To Free French Air Force	L4798, L4807, L6869, N1208, N1245, N1300, P1713, P1735, P1736, P1738, P9059, P9078, P9102, P9103, P9134, P9181, P9184, R2036, R2039, R2040, R2043, R2045, R2046, V9614
To Indian Air Force	L1244, L4740, L4748, L4765, L4767, L4770, L4786, L4794, L4801, L4816, N1212, N1255, P9120, P9131, P1675, P9176, P9178, P9179, P9180, R1987, R2033, DG447
To Portuguese Army as 361-368	V9309, V9321, V9363, V9439, V9555, V9594, V9705, V9729
To UK DG442-447 RAF, but only 438-440 delivered.	434, 436-440
To USAAF, initially 2025th & 231st Gunnery Flts.	L4687, P1680, P9122, R9011, T1469, T1517, T1524, T1552, T1574, T1616, T1682, V9299, V9302, V9356, V9495, V9506, V9512, V9665, V9741, V9743, V9776, V9778, V9817, V9867, V9885

Aircraft modified

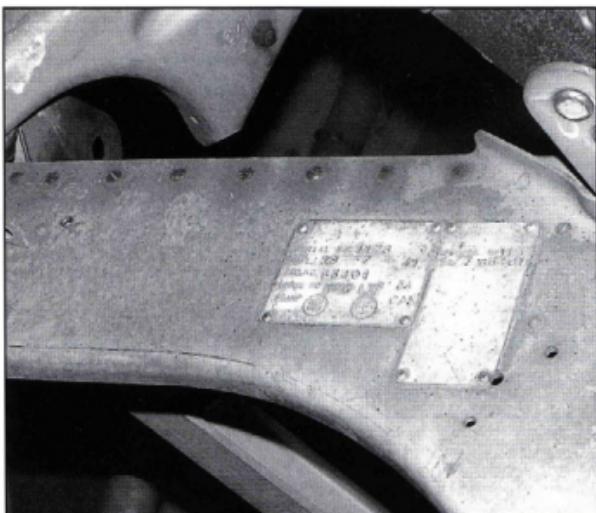
Mod to P-12	K6127
Pregnant Perch, ventral gun	L4673
Mod to Mk.II	L4674
Dual control	L4675
Mod. TT.Mk.I	R2572, R2575, R2578, R2581, R2587-89, R2598, R2632, R2638
Mod. TT.Mk.II	L6867, N1289, N1320, P9099, R1998
Mod. TT.Mk.III	P1666, P1668, P1681, P1683, R2651, R2652, N1209, N1289, N1320, P1715, P9109-P9111, P9113-P9115, P9117, P9123, P9125, P9126, P9128, P9130, P9133, T1570, T1576, T1445, T1450, T1453, T1456, T1458, T1461, T1532, T1534, T1571, T1583, T1616, T1623, T1626, T1633, T1642, T1674-T1679, T1688, T1692, T1699, T1746, T1750, T1752, T1763
Mod to Mk.III(SD)	R2626, R9009, R9106, T1456, T1508, T1583, T1750, T1770, T1771 (prototype), V9287, V9289, V9353, V9367, V9495, V9512, V9615, V9665, V9674, V9808, V9818, V9822, V9823, V9867, V9885, V9889

Boulton-Paul turret fitted	P1723
Blackburn Steiger wing	P9105
Ski trials	459, 2425
Pattern aircraft for Canadian TT.Mk.III	460
Crop sprayers	433 to CF-DRL, 451 to CF-DGI-X
Mod to glider tug	V9372, V9579, V9679, V9726

Westland Lysander Dimensions (All Marks)

Length	30 ft 6 in	9.29 m
Wingspan	50 ft 0 in	15.24 m
Tailplane span	12 ft 6 in	3.810 m
Stub wing span	17 ft 8 in	5.380 m
Height	14 ft 6 in	4.42 m
Wheel track	9 ft 0 in	2.740 m
Wing Area	260 Sq ft	24.15 Sq m

Nicely illustrating the challenges of correctly identifying a Lysander, here is one of the data plates of the US based Bristol Heritage Collection aircraft RCAF 1176, with the correct serial visible twice, but also with the serial 1175 on an adjacent piece upside down. Andrew Appleton.



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Survivors



The Lysander was an obsolete type at the war's end, and quickly vanished from service. There were a couple of attempts to utilise Lysanders for civilian purposes, but only Westland Dusting Service in Canada managed to find work for the type. Despite its rarity and oddity, there have been many attempts over the years to fly a Lysander as a warbird, and while most operators have eventually grounded their machines, this has generated a number of museum display aircraft – truly a synergy of the warbird and museum movements.

The vast majority of surviving Lysanders are from Canada; they are either from Canadian production or Westland-built and shipped to Canada. Sadly, the majority of the surviving Lysanders war service is not known. Because of the modular nature of their construction there has often been understandable confusion over particular aircraft identities – panels stencilled with one Lysander's serial number being gathered up with sections from another machine, and the identity from the panel being assumed for all. We present our list as the aircraft are represented today, and the reader is advised to bear in mind that most of these aircraft have at least parts from other machines, while accurate recording of a serial has been a challenge to say the least!

We are lucky that there are now more preserved Lysanders in various stages of rebuild and on show than at any time since W.W.II. We have been able to use most of these to add depth to our walkround section. The following list is also presented, therefore, to clarify which aircraft has been used in the photos, and to enable the reader to find out where they can see a real Lysander. The good news is that while there may only be one flying Lysander at the time of writing, there are several in good hands in major national collections, and there are no less than three under rebuild to fly. Finally, this is a list of complete Lysanders – there are other Lysander parts collections in store, with identities, some in the initial stages of rebuild, but these have not been included here.

One of the rare occasions when two Lysanders have been seen together. More, it was five Mercuries on song, with the Blenheim and Gladiator joining in. Flying Legends, Duxford. James Kightly.

Shuttleworth Collection, UK

Coming in at the home base of Old Warden, this could almost be an agent pick-up. Nick Blacow.



The most active Lysander is the only airworthy machine in the world at the time of writing, and it is in the safe hands of the Shuttleworth Collection. It is V9552, a Mk.IIIA registered as G-AZWT, and it was restored to fly by the much-missed Strathallan Aircraft Collection, flying in 1979 (as V9441 AR-A) after arriving in Scotland in 1971. Due to problems with the reliability of the Mercury engine, it was stored between 1987 and 1997 when it was flown down to Duxford by John Romain, and where the engine, which had even given John a hard time on the way down, was made to behave by the ARC Mercury specialists. It flies at Old Warden today in an all black scheme as V9367 MA-B and was fitted with a dummy long-range tank by the Shuttleworth engineers.

RAF Museum, UK

On display in Army co-op colours, R9125 still has the rear cockpit interior as converted for special duties. James Kightly.



Westland-built Lysander Mk.III R9125 is probably the most historic example of the type, and rightly resides in the RAF Museum. It actually served with 161 Squadron in 1944, after its first operational posting with 225 Sqn on 29th September 1940 with whom it undertook anti-invasion patrols, and then was later being converted to a target tug, after which it worked with the Central Gunnery School. This was the aircraft, painted as JR-M, used in the film 'Now it Can be Told' about the SOE in 1944. Now displayed as LX-L, most visitors don't realise its fascinating history, and that it is both the oldest Lysander and the only surviving genuine spy-dropper.

Imperial War Museum, Duxford UK



V9300 in the IWM Duxford Superhangar. James Kightly.

Canadian Lysander Mk.IIIA V9300 (RCAF 1558) was registered as G-LIZY for the British Aerial Museum with an intent to restore it to airworthy condition. However, setbacks due to the Blenheim accident resulted in its restoration to static condition by the Aircraft Restoration Company and sale to the IWM. It is now on display as MA-J, the aircraft of Hugh Verity, a most appropriate subject as the man who made the operations of 161's Lysanders most famous.

Aircraft Restoration Company, UK



A 2005 photo of the fuselage of V9132. At the time of writing, the wings are almost finished and the fuselage will be next. Brian A Marshall.

The Aircraft Restoration Company at Duxford have Westland-built Lysander V9132 under active rebuild to fly, which is exciting news. Thanks to John 'Smudge' Smith, we know that it was number 33 off the production batch built at Yeovil during 1940, although it has a number of 1938 parts in it as well. So far, John estimates that they have been able to save (and reuse) 95% of the metal structure of the wings. The aircraft flew with 225, 613 and 4 Sqns in the UK before being shipped to Canada. Detective work on the aircraft's history continues, and any information would be appreciated via the IWM at Duxford.

Canadian Warplane Heritage

On one of the engine runs undertaken before winter set in in 2005. Jim Buckel.



The Canadian Warplane Heritage are steadily progressing on the restoration of their Lysander, 2363, a Mk.IIIA (in bright TT colours) to airworthy condition, which it is hoped will be imminent, as taxiing trials had commenced in 2005. Registered C-GCWL it will be at least the third Lysander to fly as a warbird in North America, but will be the first warbird to fly anywhere in the world in the TT scheme: an important part of military history, one often-overlooked aspect of the war and a major Canadian training contribution.

Whereatt's Warbirds, Canada

Parked up and not telling. Greg Putz.



Lysander Mk.IIIA C-FVZZ 2365 belongs to Harry Whereatt of Assiniboia, Saskatchewan, Canada, along with a number of other airframes. Harry's aircraft is complete, and theoretically airworthy, but no-one is telling if it has actually flown or is going to fly again. It is in the rare but striking TT colours it may well have worn in wartime service.

Canadian Museum of Flight



*Seen at EXPO 86, the Canadian Museum of flight's 'Gossamer' Lysander.
James Kightly Collection.*

One of the most unusual restoration sagas was the effort of the Canadian Museum of Flight to build a see-through 'Gossamer' Lysander for the Vancouver Expo 86, which had a theme of 'Transport'. A major effort in four months managed to complete RCAF 2349 and have it on show in time, parts for the restorations having been collected from as far apart as Texas and Saskatchewan, and donated by warbird family Ed, Mark & Rose Zalesky. Since then it has been on show at the Museum's then peripatetic homes, settling in Langley B.C. and with its transparent covering providing a very different view of this form of construction.

National Aviation Museum, Canada



In immaculate condition, 'R9003' nestles under the wing of the Museum's Lancaster. James Kightly.

This aircraft, a Lysander Mk.III painted as R9003, was rebuilt from a number of different Westland and Canadian Car airframes during the 1960s by Capt B Lapointe, flying on December 29th 1967 at Winnipeg. It is unusual because it is acknowledged as a composite airframe. After a number of flights the machine was donated and flown to the museum where it is displayed as a British built Lysander I, as it served with 110 Sqn RCAF in England during 1940.

National Air & Space Museum, USA

Restored and flown during the seventies 2346 gets air under her tyres again in 2005. Richard Wallach



In 1974 American Dwight Brookes flew Canadian built Lysander 2346 (registered N7791 and painted as N7791 AC-B of 138 SD Sqn) after a two year restoration from Van Nuys, California, making it the only US flown Lysander. Originally it had been owned by eccentric farmer and collector Ernie Simmons of Tillsonburg, Ontario, and it passed through a number of hands before reaching Dwight. Despite relishing the challenge of restoring, flying and maintaining this unique 'bird' (for instance overcoming problems with the carburettor with help from Rolls Royce Bristol Engines) he eventually donated it to the NASM in 1979. They loaned it to the United States Air Force Museum in Dayton Ohio, who displayed it between 1979 and 1997. After a few years in store, it was hung in 2005 in the giant hall of the Udvar Hazy Center of the Smithsonian National Air & Space Museum, in Washington.

Fantasy of Flight, USA

Today grounded (but theoretically airworthy) Canadian Lysander Mk.IIIa (construction number 1244) is one of Kermitt Weeks' amazing collection at the Fantasy of Flight, Polk City. It was shipped to the US and re-assembled in 2001, after finishing an intermittent flying career in the UK after a restoration



Lysander 1224 outside on display at the local Sun n' Fun airshow. Mike Shreeve.

to fly originally completed in 1977, as V9281 RU-M for Philip Mann, later being acquired by Doug Arnold. A crash landing that left it overturned in a field (rather like a wartime SOE Lysander) in 1983 resulted in another rebuild for new owner Brian Woodford, and flying yet again in 1987, and later being operated by the Aircraft Restoration Company at Duxford as V9545 BA-C between 1996 and 1998 before its sale across the Atlantic.

Indian Air Force Museum

As a result of seeing the Lysander 'R9003' in 1967, when visiting the National Aeronautical Collection at Rockcliffe, Canada, Air Chief Marshall Arjan Singh, CAS of the Indian Air Force, was very interested in seeing if it would be possible to obtain a Lysander for the Indian collection from Canada. As it happened Air Marshal Reyno RCAF found that 402 (Auxiliary) Sqn were completing the restoration of Lysander Mk.III 1589 as a centennial project. It was generously donated to the Indians, and handed over after a flight by Hercules to India in September 1967 in Palaam, New Delhi. In return, the Indians donated Liberator HE773 to Canada, and a RCAF team flew that aircraft all the way home - a huge undertaking.



Repainted in a broad interpretation of wartime colours, nevertheless 1589 is a treasured relic of the Indian Air Force Museum. Jagan Pillarisetti

Sabena Old Times, Belgium

Another airworthy rebuild underway at present is the Lysander Mk.IIIA V9546, registered OO-SOT for the Belgian group Sabena Old Times. The aircraft was restored originally between 1982 and 1988, and flew as 2442 MA-D in Belgium, France and Britain at shows. Ground-looped on landing at Brussels in January 2002, it required a major rebuild. Despite some initial doubts, the team are rebuilding it to fly, and have taken on another airframe (currently anonymous) to rebuild to static display for the Musee Royal de l'Armee in Brussels.

In happier days when overflying La Ferte Alais near Paris. James Kightly.



Musee de l'Air et l'Espace, France

Lysander Mk.IIIA 2375 has turned into a globe-trotter after static restoration by the Commonwealth Air Training Plan Museum at Brandon, Manitoba, who had it between 1988 and 2000. Sold to Germany, it was offered to the Portuguese Air Force Museum who declined it after examination, and is now in the restoration shop of the Musee de l'Air outside Paris, awaiting rebuild. At last France may finally have an example of the type that did so much to support the Marquis.

Previously, another anonymous Canadian example was destroyed in a hangar fire with a number of other aircraft in 1990, and as noted earlier, the genuine Lysander Mk.III (SD) donated to France after W.W.II seems to have simply disappeared. Third time lucky?

The ex-Brandon Lysander temporarily in the restoration area at Le Bourget. Laurent Boulestin.



GENERAL VIEW

The Shuttleworth Lysander G-AZWT comes in to land at Old Warden. Gary R. Brown

Westland Lysander



Parked just after arrival at Duxford, 1244 'V9281' was awaiting an over-haul by ARC. Mark Ansell.





Top: The Canadian Warplane Heritage Lysander with the wings newly attached, a couple of years ago. Jim Buckel.
Lysander 1244 after a repaint into ASR colours while operated by ARC at Duxford. James Kightly.
The Shuttleworth Lysander still in its previous, Strathalan-applied scheme, but with the new black long-range tank attached. James Kightly



Two photos of the CWH Lysander undertaking its first engine runs at Hamilton Ontario on May 20th 2005. Jim Buckell.





Top: The Shuttleworth Lysander taxis up the slope at Old Warden before the long-range tank was fitted. Note the angle of attack of the horizontal tailplane. James Kightly.

Below: David Henchie of the IWM is introduced to the newly arrived Lysander by ARC member Neville Gardner. James Kightly.





The Sabena Old Timer's Lysander taxis past at La Ferte Alais. James Kightly.



Three Lysanders together at Duxford for Flying Legends in 1995. James Kightly.

Bottom: The IWM-owned static Lysander V9300 was rolled out to join the other airworthy Lysanders at Duxford on the Flying Legends weekend in 1995. James Kightly.

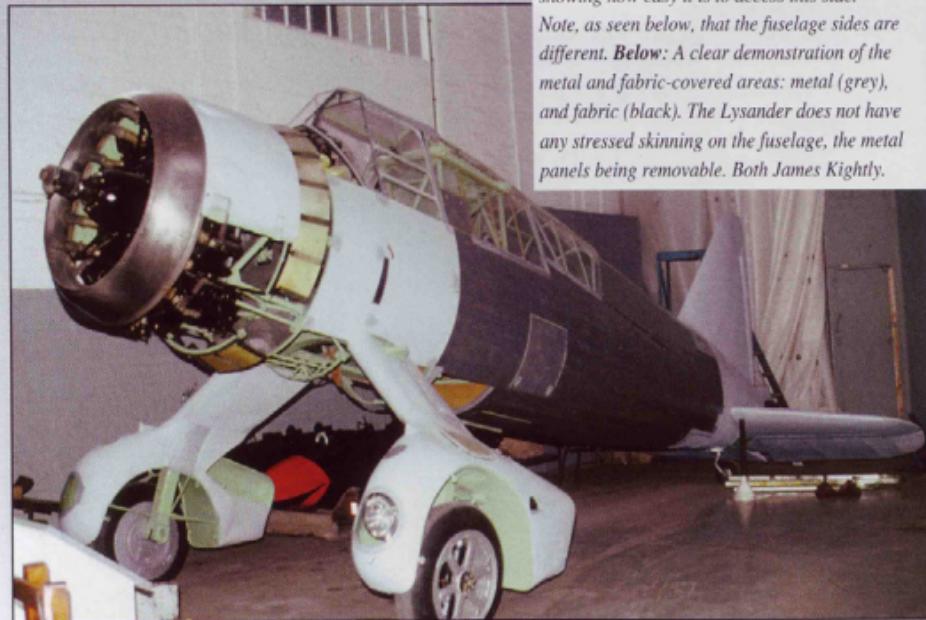


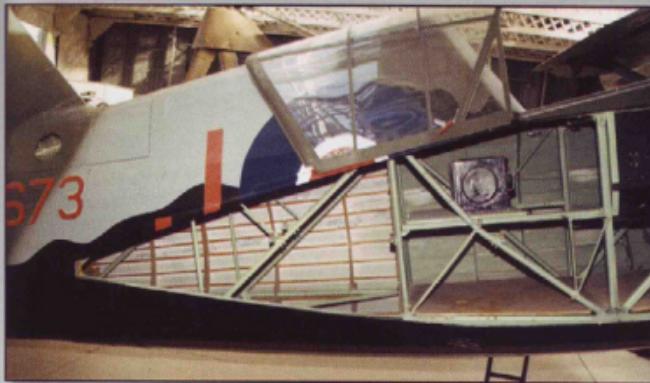
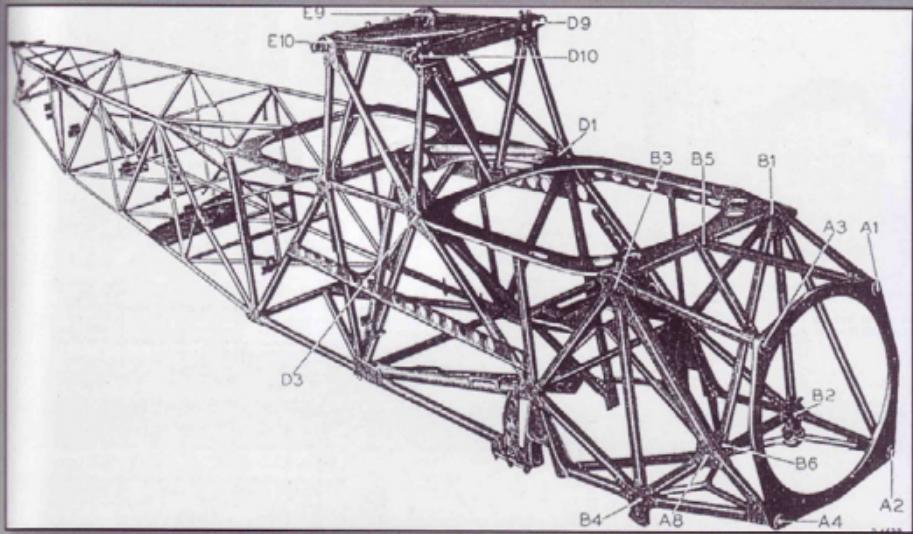
FUSELAGE



Above: The SOT Lysander has the access panels removed while on the ground at La Ferte Alais, showing how easy it is to access this side.

Note, as seen below, that the fuselage sides are different. *Below:* A clear demonstration of the metal and fabric-covered areas: metal (grey), and fabric (black). The Lysander does not have any stressed skinning on the fuselage, the metal panels being removable. Both James Kightly.

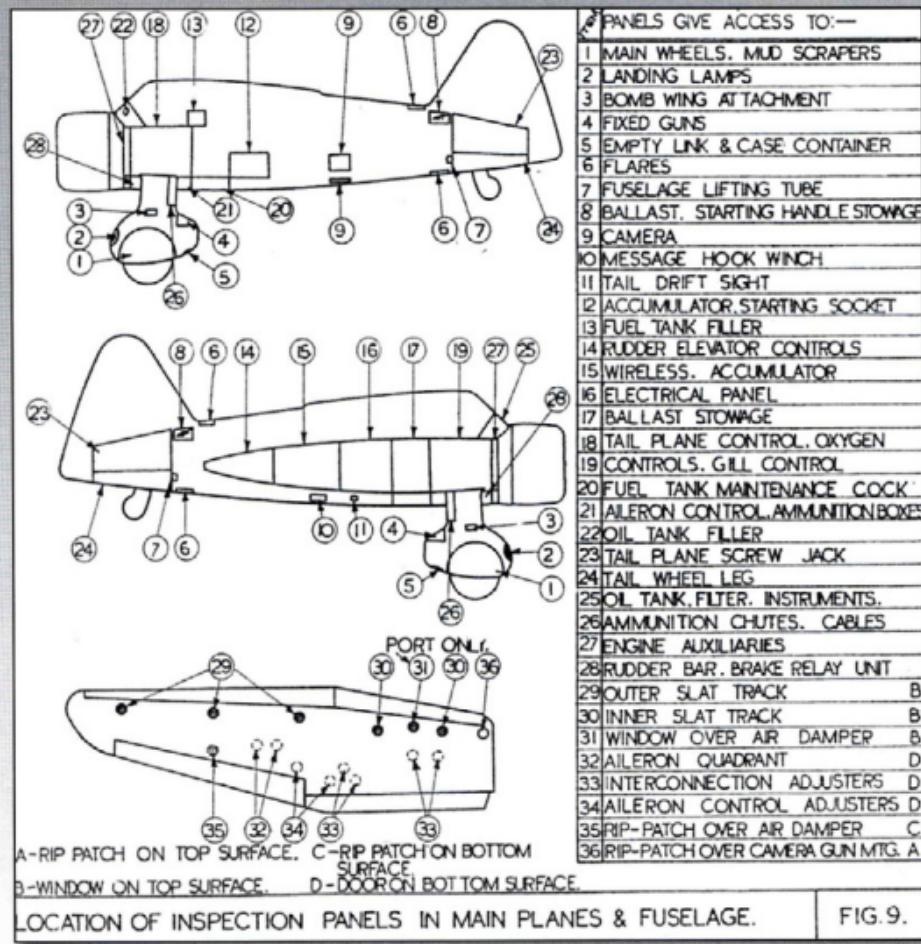
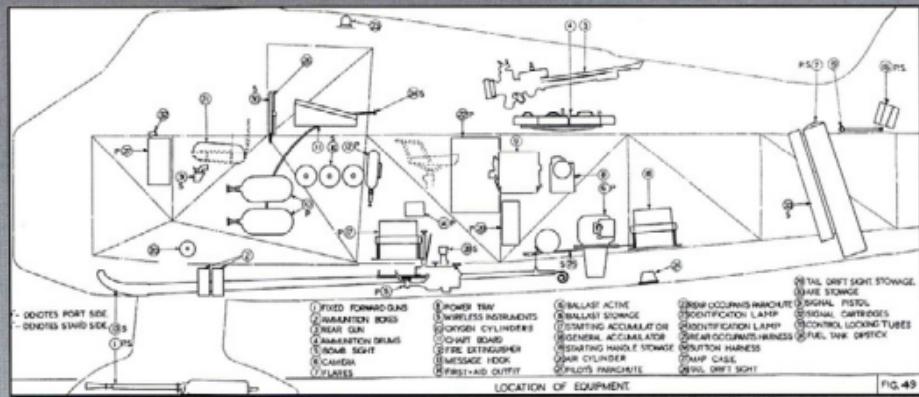


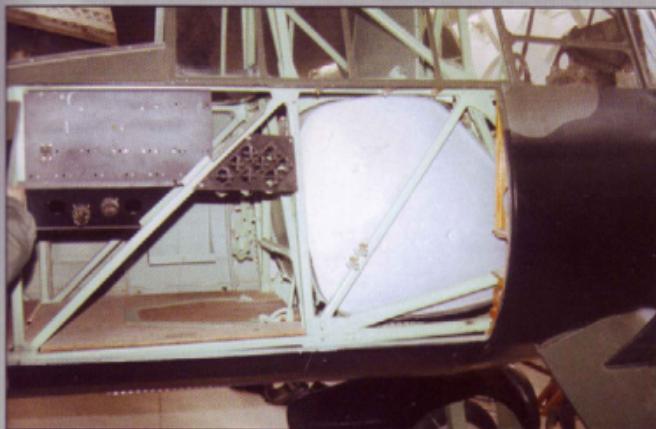


Top: From the Air Publication on the Lysander, this shows the fuselage frame structure. Note the cockpit edging for the pilot's and observer's positions. TNA.

Two photos of the starboard side panelling on the IWM aircraft. Unlike the airworthy (and thus modified) examples, this aircraft is a static restoration missing some pieces but with a good deal of original wartime equipment fitted. MMP.

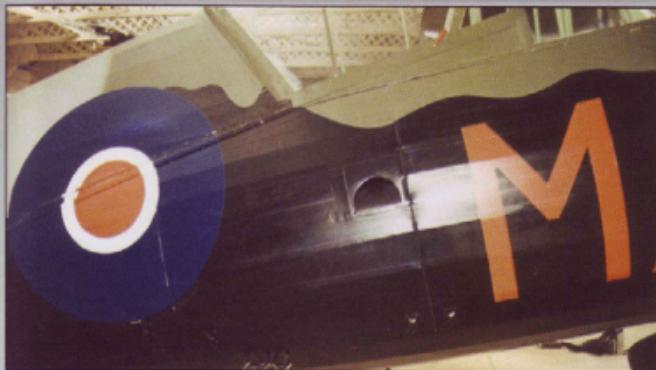
Next page: Two drawings from the Lysander Air Publication (AP1582B) showing the location of the equipment as originally set up for Army co-op, and (below) the various inspection panels. TNA.





Top left: The forward panel area. Note the fuel tank on the right. MMP.

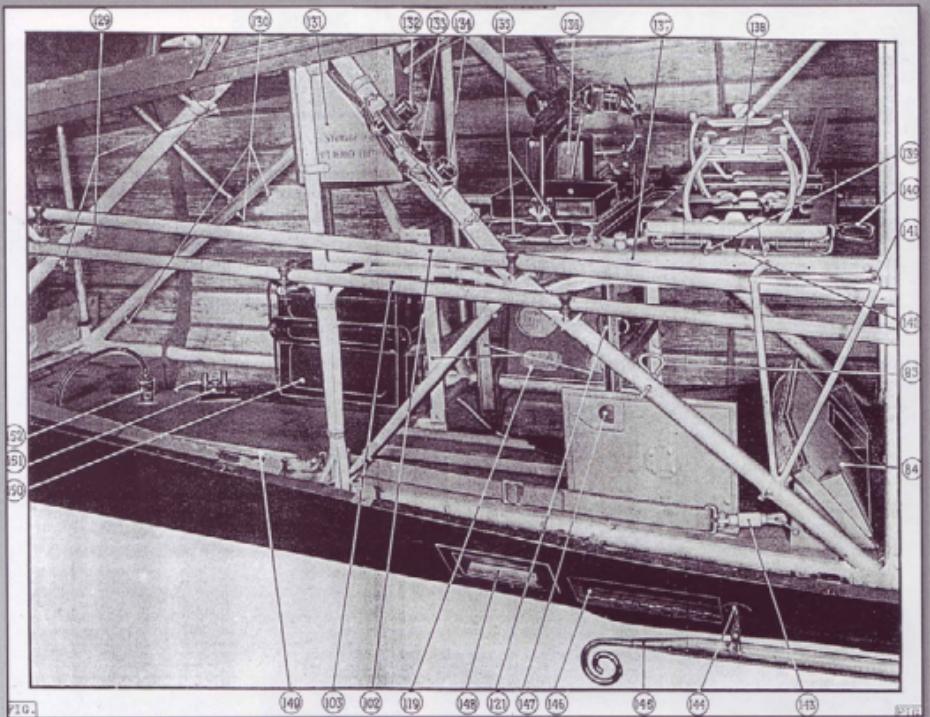
Top right: One of the spring-loaded footsteps. MMP.



Middle: The removable panel is a neat but noticeable fit. MMP.

Lower: Another level of examination: with the covering missing, but the wooden substructure over the fuselage frame. Note that the control runs are fitted on this example. Cam Harris.



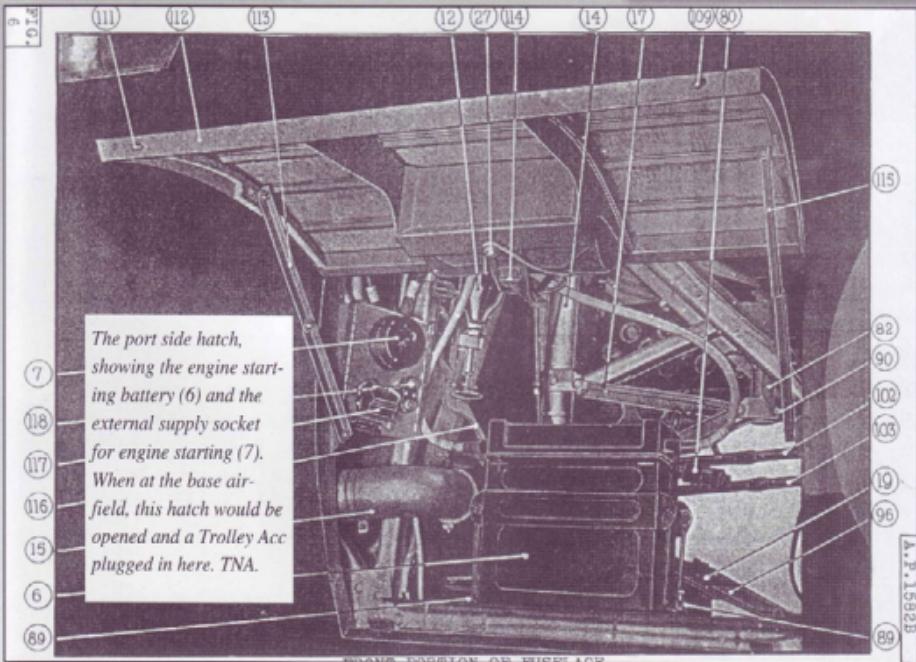
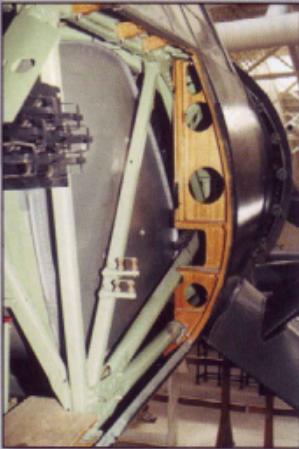


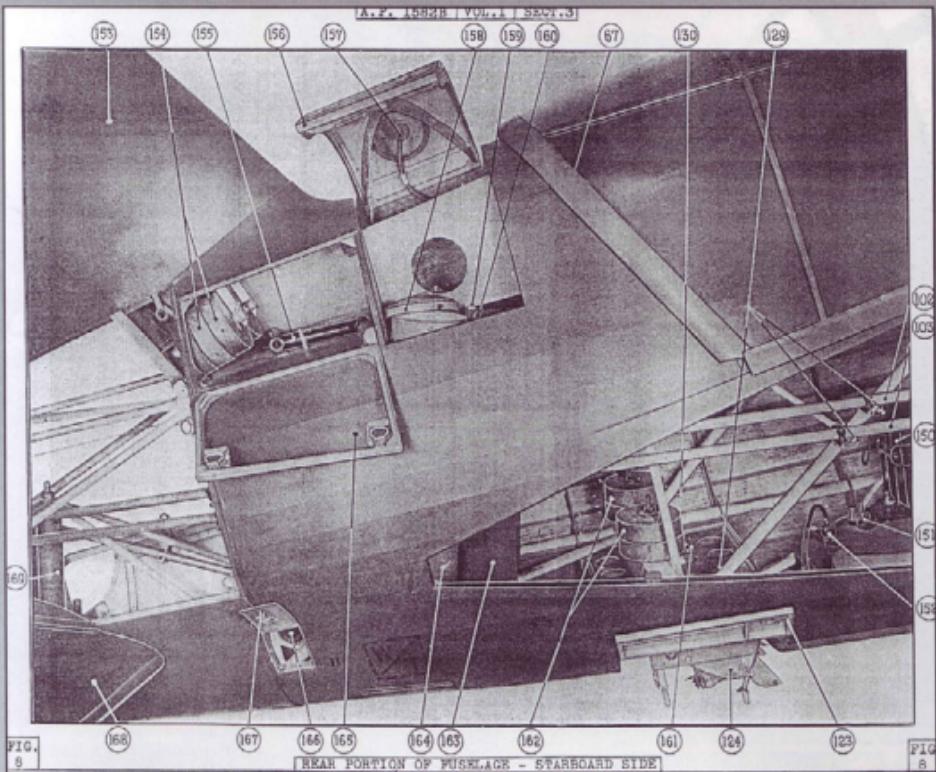


Previous page: top. The interior as it was meant to be fitted out for Army co-op work. TNA. *Lower.* Looking aft inside the rear fuselage towards the tail. The flare chutes are missing here. The tailwheel strut can be seen. Note the way the wooden formers are attached to the fuselage frame. MMP.



Top left: The upper rear turtledeck interior. *Middle left:* Two of the Tufnol control run guides (the control push-rods are missing). *Middle right:* The position of the guides on the frame, and the build out from the frame to the curve of the fuselage. Starboard, looking forward. All MMP.

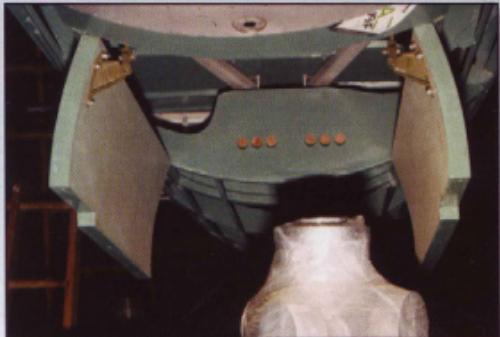




Top: The AP 1582B showing the rear fuselage hatch. The starting handle (155) is shown and the vital tail ballast weights (154) are always meant to be visible through the transparent panel (165); circular on Canadian-built aircraft, rectangular on Westland aircraft. There are further weights (162) on the rear floor, and near them - just visible - are the flare tubes (164). The cover (167) is over the tail bar lifting tube (166) - all good material for dioramas. TNA.

Right: The real hatch on the IWM example. MMP.

Lower: The hatch (on the Langley aircraft) for the observer to deploy the target drogues through on the TT examples. James Kightly.





Two good views of the genuine overload tank fitted between the cockpits on the SD aircraft, on the RAF Museum's genuine SD example. This extra is often overlooked, but shows why communication between pilot and passengers was impossible. James Kightly



Top: A modern version of the SD ladder, here on the SOT example. Note the differences between this and the Shuttleworth aircraft as seen below. James Kightly.



Top left: The fuel gauge on the top of the main tank in non-SD Lysanders. Directly behind the pilot, it would take some contortions to see!



Top right: A view of the main tank from aft of the floor of the empty observer's position. MMP

Middle: Looking down to the floor of the observer's position, showing the upper hatch for the forward opening bomb-aiming position. A course setting bombsight would be fitted here for horizontal bombing attacks. MMP.

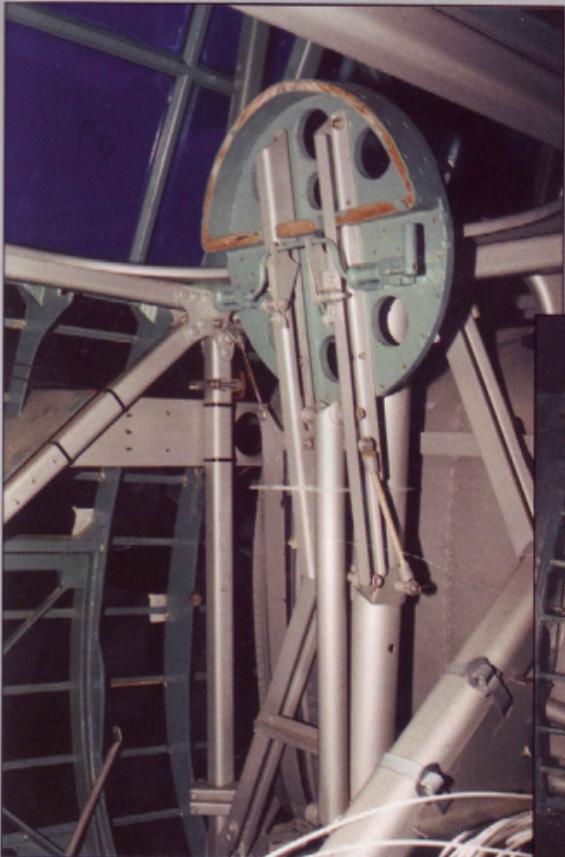


Lower: Another observer's position, this one showing the fold-away seat fitted and out. James Kightly.





Clockwise from top left:
The TR-9D Radio on the
shelf beneath the observer's rear deck. MMP.

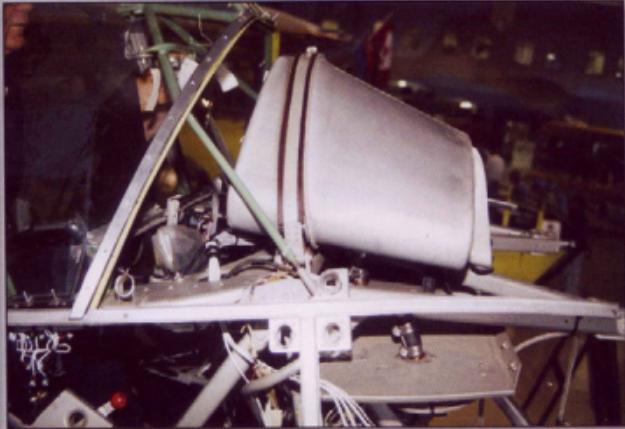


A view of the signal pistol cartridge stowage
from outside. MMP.

A view of the fuel tank from the
normally-covered port side on
the Langley machine. James Kightly

The observer's seat folded away, also
on the CWH machine. Cam Harris





Clockwise from top left: The fire-extinguisher fitted in the observer's position. James Kightly.

The oil tank in front of the pilot's instrument panel. James Kightly.

The bottom of the main fuel tank, showing the drain. MMP.

The starboard removable panels arranged together, and (inset) the quick-release fasteners used on them. MMP.

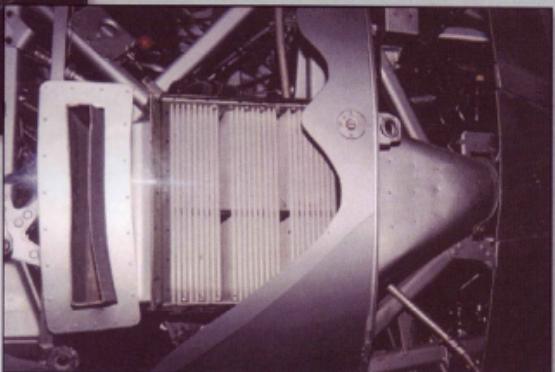




Top: A good underside view showing the arc of the undercarriage beam and fuel tank. The compressed air bottle for the brake system is mounted below the beam inside the lower fuselage. James Kightly.

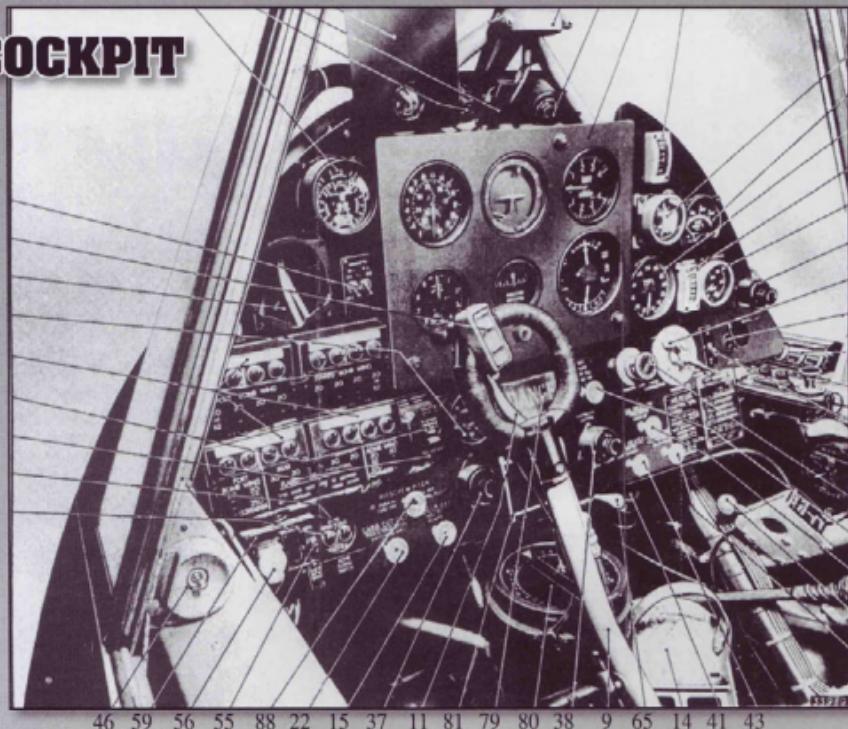


Middle: A good view of the oil cooler and outlet on the port side of the CMF machine. James Kightly.



*Middle, left: The Canadian style footstep. James Kightly.
Bottom, left: Another angle on the exhaust pipe end on the CAM aircraft and the target-towing style hatch open. James Kightly.*

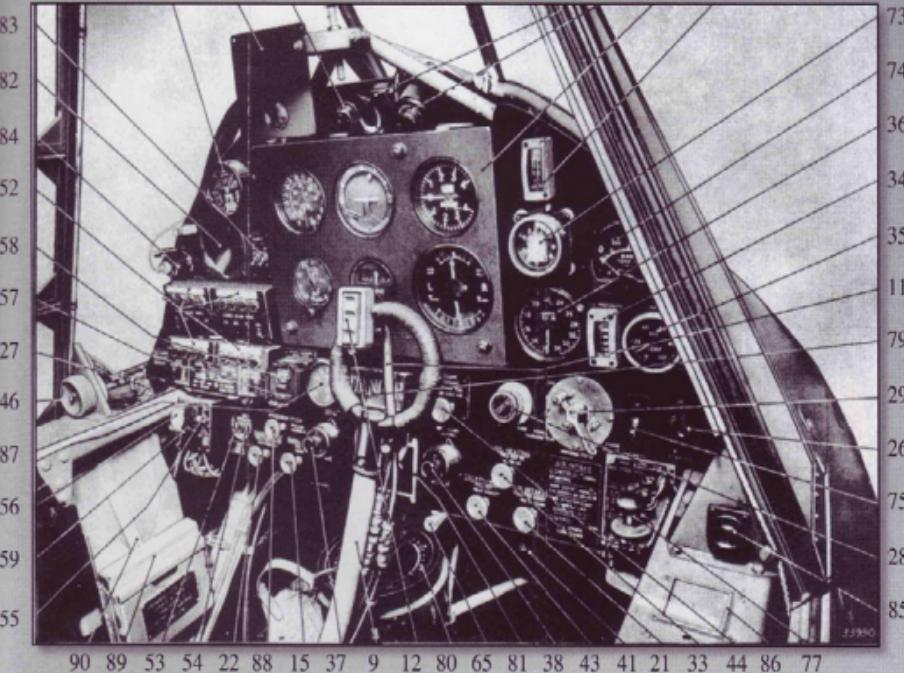
COCKPIT



- | | | |
|--|---|---|
| 9. Control column
11. Brake control and parking lever
12. Gun selector control pushbutton
13. Triple pressure gauge
14. Rudder bar footplate
15. Rudder bar control knob
21. Carburettor air-intake heat control knob
22. Carburettor slow-running cut-out control knob
26. Engine starting pushbutton
28. Fuel priming pump
29. 3-way priming cock
30. Fuel pressure gauge
33. Oil heating control knob
34. Oil pressure gauge
35. Oil temperature gauge
36. Engine-speed indicator
37. Dimmer switch for instrument panel floodlamp - port | 38. Dimmer switch for instrument panel floodlamp - starboard
41. Compass lamp
42. Dimmer switch for compass lamp
43. Cockpit heating control knob
44. Cockpit cooling control knob
46. Landing lamp switch
47. Forced landing flare release
48. Gun sight socket
49. Gun sight dimmer switch
50. Gun sight terminal block
51. Ring sight
52. Bomb selector switches
53. Bomb nose fuzing switch
54. Bomb tail fuzing switch
55. Bomb jettison master switch
56. Flap over bomb jettison pushbutton | 57. Bomb container jettison switchbox
58. Flap over bomb container jettison pushbutton
59. Bomb jettison switchbox
71. Panel for bomb distributor
72. Flying-instrument panel
73. Boost gauge
74. Cylinder temperature gauge
75. Starting magneto switch
76. Navigation and pressure head heating switchbox
77. Morsing key
78. Identification switchbox
79. Flap over R.3002 pushbuttons
80. Compass
81. Compass deviation card holder
82. Aperture for clock
83. Main magneto switches
87. Air temperature gauge
88. Airscrew pitch control knob |
|--|---|---|

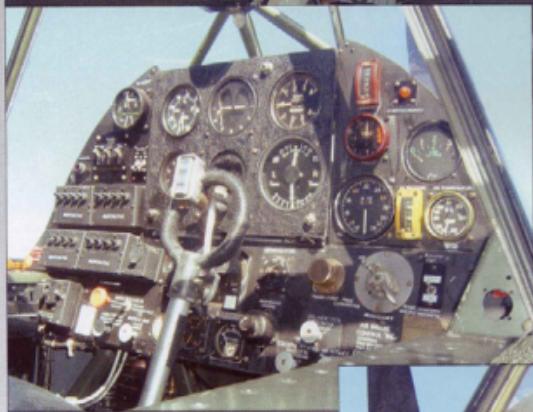
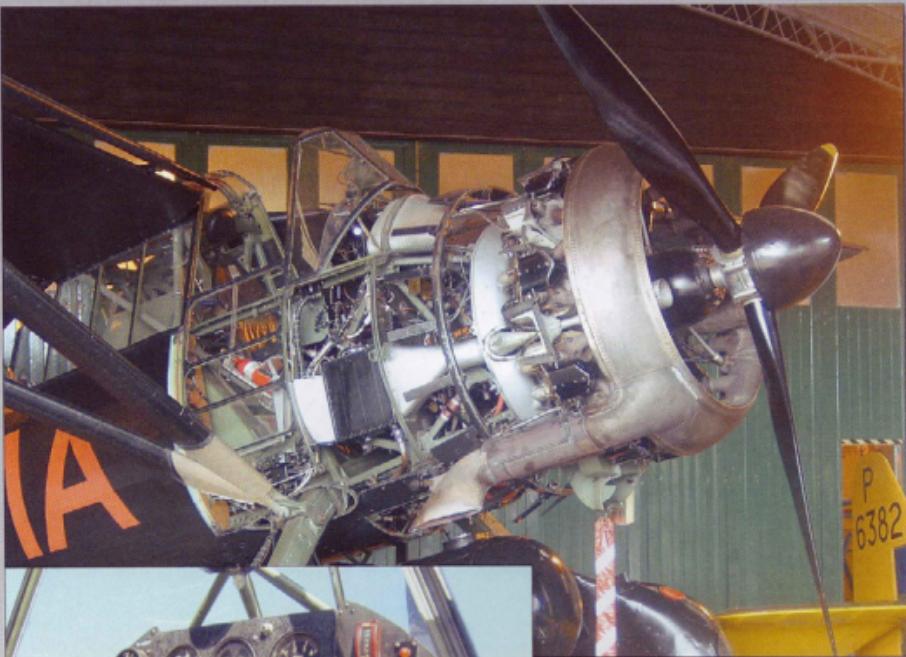
13 71 48 51

50 49 72 30



90 89 53 54 22 88 15 37 9 12 80 65 81 38 43 41 21 33 44 86 77

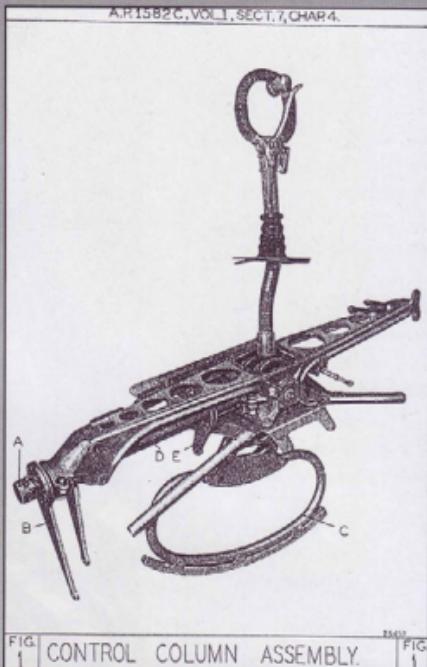
9. Control column
 11. Brake control and parking lever
 12. Gun selector control button
 13. Triple Pressure gauge
 15. Rudder bar control knob
 21. Carburettor air-intake heat control knob
 22. Carburettor slow-running cut-out control knob
 26. Engine starting pushbutton
 27. Master fuel cock control
 28. Fuel priming pump
 29. 3-way priming cock
 30. Fuel pressure gauge
 33. Oil heating control knob
 34. Oil pressure gauge
 35. Oil temperature gauge
 36. Engine-speed indicator
 37. Dimmer switch for instrument panel floodlamp - port
 38. Dimmer switch for instrument panel floodlamp - starboard
 41. Compass alarm
 43. Cockpit heating control knob
 44. Cockpit cooling control knob
 46. Landing lamp switch
 48. Gun sight socket
 49. Gun sight dimmer switch
 50. Gun sight terminal block
 51. Ring sight
 52. Bomb selector switches
 53. Bomb nose fuzing switch
 54. Bomb tail fuzing switch
 55. Bomb jettison master switch
 56. Flap over bomb jettison push-button
 57. Bomb container jettison switch-box
 58. Flap over container jettison push-button
 59. Bomb jettison switchbox
 65. Camera sight cover control
 71. Panel for bomb distributor
 72. Flying-instrument panel
 73. Boost gauge
 74. Cylinder temperature gauge
 75. Starting magneto switch
 77. Morsing key
 79. Flap over R.3002 pushbuttons
 80. Compass
 81. Compass deviation card holder
 82. Aperture for clock
 83. Main magneto switches
 84. Bomb distributor plug
 85. Rear occupants attention pushbutton
 86. A.S.I. correction card holder
 87. Air temperature gauge
 88. Airscrew Ditch control knob
 89. Computer stowage case
 90. Map case



View of the Shuttleworth aircraft. All the nose panels removed, for work around the engine mount. Normally, not all of these would be removed, but they could come off, if required, in the field.

Two views of the pilot's panel. Note that as an airworthy aircraft there are some variations from the original, particularly the 'INOP' tags! All James Kightly.





Clockwise from top left: The column and spade-grip on the CWH machine. James Kightly.

The column unit, from the AP. Note that it is a much more substantial piece than just a stick. TNA.

The P-2 Compass fitted between the pilot's knees. MMP

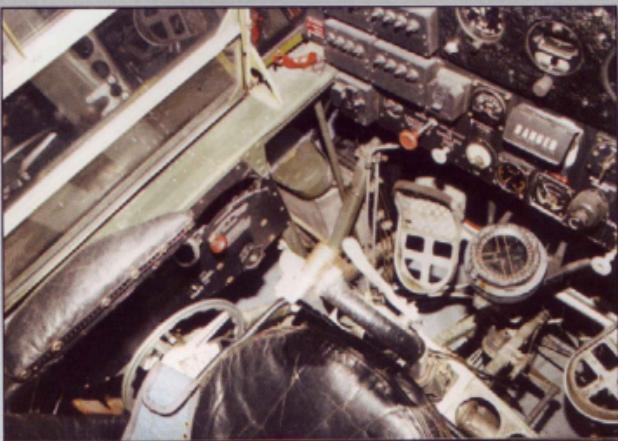
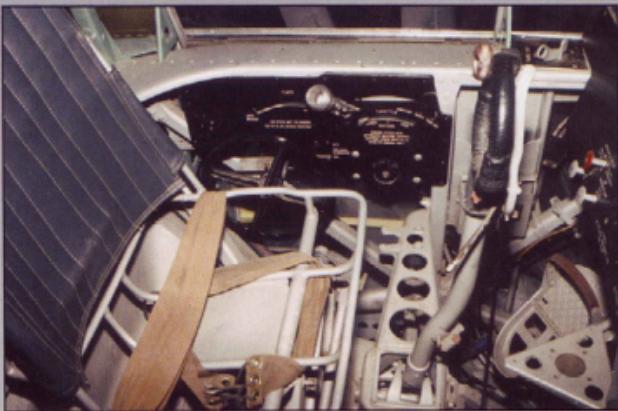
The grip on the IWM machine. Note that these show the early single-trigger round gun-button, rather than the later rectangular multiple gun-button seen on the Shuttleworth and other examples. MMP.



Top: Looking down to the port side of the cockpit on the IWM machine. Note the lower part of the control column assembly, and the skeletal seat base. In flight, the pilot's seat type parachute would fill this space. MMP.

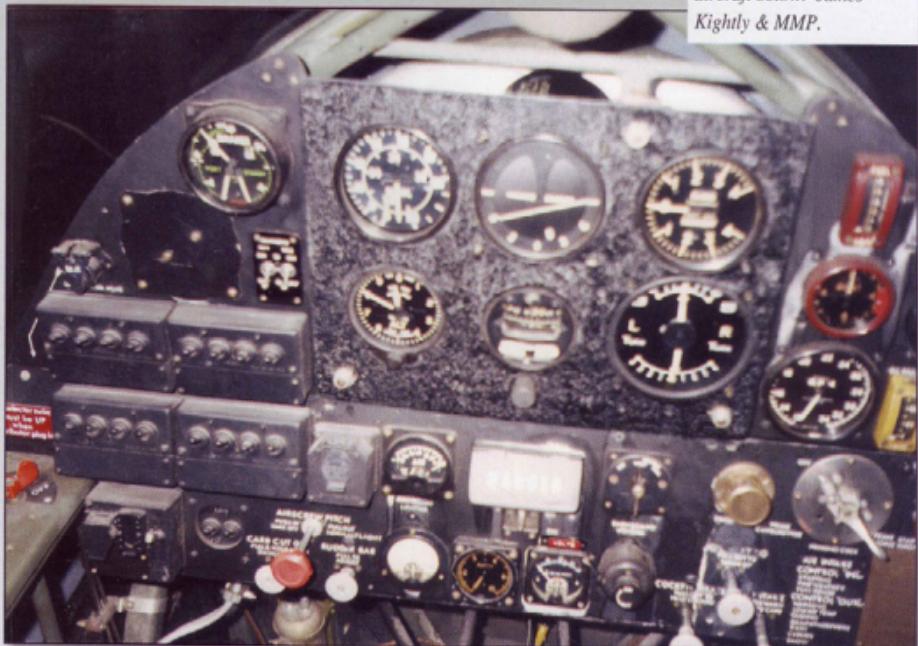
Middle: Detail of the forward corner. Note the trim wheel on the left. See page 148 for a detail of this. MMP.

Lower: Another view of the panel. Note the wide ranges of thicknesses and shapes. Not flat by any means! MMP.





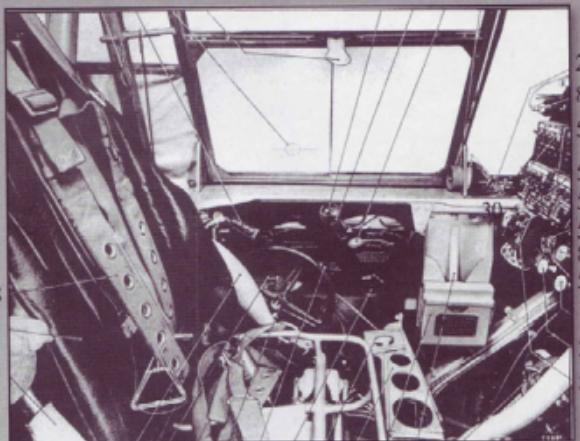
Top: The pilot's panel on the IWM machine. Contrast the colours on the minor switches and different or missing instruments to the panel from another aircraft below. James Kightly & MMP.



4. Window release tab
5. Footplate
6. Pilot's seat
8. Armrests
10. Tail plane adjusting handwheel
15. Rudder bar control knob
16. Tail plane position indicator
17. Bomb firing pushbutton
18. Mixture lever
19. Throttle friction control handwheel
20. Throttle lever
22. Carburettor slow-running cut-out control knob
27. Master fuel cock control
31. Fuel contents gauge illumination switch
46. Landing lamp switch
52. Bomb selector switches
53. Bomb nose fusing switch
54. Bomb tail fusing switch
55. Bomb jettison master switch
56. Flap over bomb jettison pushbutton
59. Bomb jettison switchbox
62. Armour-plated panel port control ring
64. Camera controller wedge plate
66. Camera sight for oblique photography (in port window only)
80. Compass
84. Bomb distributor plug
88. Airscrew pitch control knob
89. Computer stowage case
90. Map case
91. Telephone-microphone socket
97. Leg straps
98. Shoulder straps

62 91 66 4

17 20 18 46

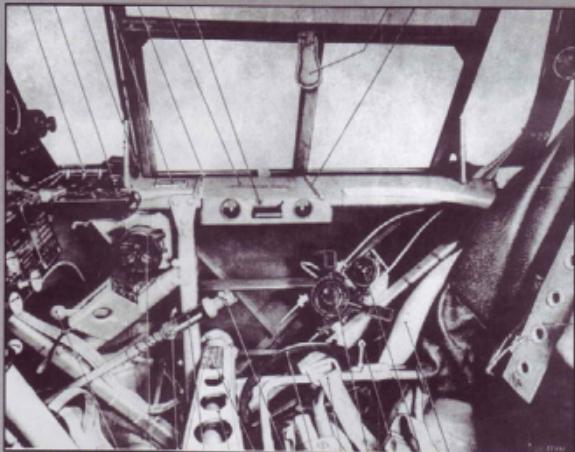


-8 16 97 10 31 19 64 5 89 90 80



Top: From the Air Publication 1582C, the Pilot's Notes. TNA.

Right: A view directly down from above the canopy in the IWM aircraft. The pilot's seat back is at the top; the control column at the bottom. RP.

35
42
26
75
29
92
33
21
43
65

47 78 24 23 5 93 25 7 97 94 96 95 8



- 4. Window release tab
- 5. Footplate
- 6. Pilot's seat
- 63 7. Pilot's seat adjusting hand-wheel
- 8. Armrests
- 21. Carburettor air intake heat control knob
- 23. Gill control indicator sleeve
- 24. Gill Control indicator pointer
- 25. Gill control handle
- 26. Engine-starting pushbutton
- 29. 3-way priming cock
- 33. Gil heating control knob
- 35. Oil temperature gauge
- 42. Dimmer switch for compass lamp
- 43. Cockpit heating control knob
- 47. Forced landing flare release
- 63. Armour-plated panel starboard control ring
- 65. Camera sight cover control
- 67. Hinged writing pad holder
- 68. Writing pad fasteners
- 69. Pencil stowage
- 70. Elastic band
- 75. Starting magneto switch
- 76. Navigation and pressure head heating switchbox
- 77. Morsing key
- 78. Identification switchbox
- 85. Rear occupants attention pushbutton
- 86. A.S.I. correction card holder
- 92. Engine data plate
- 93. Gill control indicator plate
- 94. Wireless remote controller
- 95. LC.W. switch
- 96. Harness release control knob
- 97. Leg straps
- 98. Shoulder straps

*Top: From the Pilot's Notes. TNA.**Left: A view of the pilot's seat in the CWH Lysander. Note the different back padding. Cam Harris.*



Clockwise from top left:

The tail adjusting gear-handwheel unit. TNA.



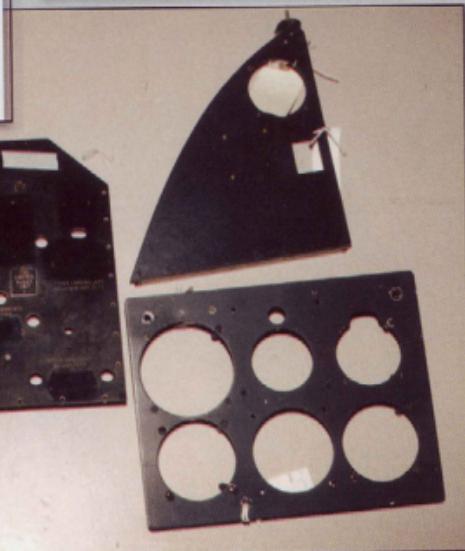
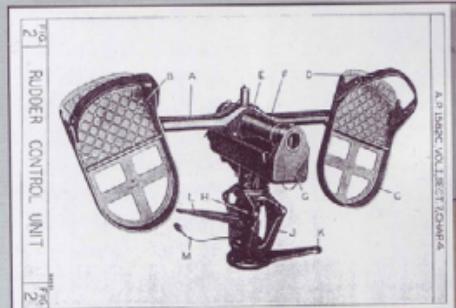
Another angle on the CWH cockpit before the main instrument panel was fitted. James Kightly.

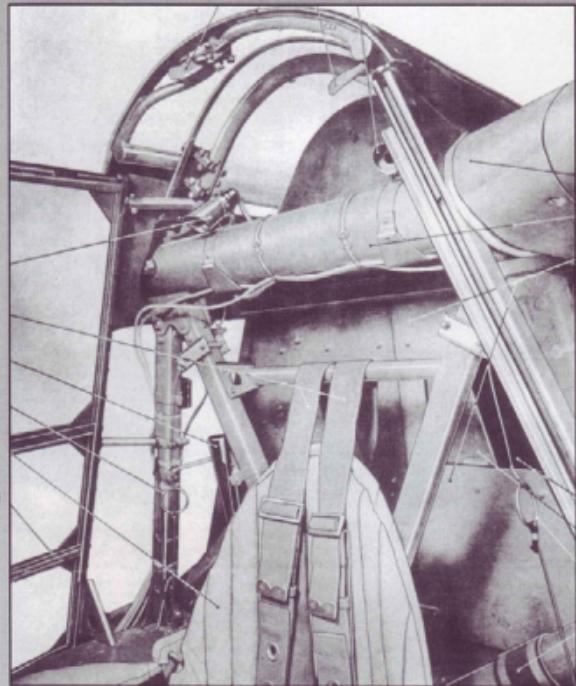
The actual panels for the cockpit. Jim Buckel.

Three of the actual panels. Jim Buckel.

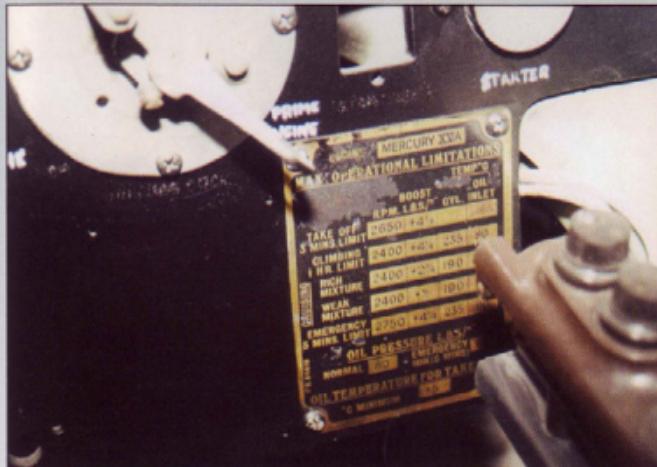
The pilot's rudder pedal assembly from the AP.

Note the 'WESTLAND' on the toe. TNA.





1. Sliding roof
2. Sliding roof centre catch
3. Sliding roof port catch
6. Pilot's seat
32. Aperture in armour-plated bulkhead
101. Instrument panel flood-lamp
102. Instrument panel flood-lamp
61. Axe
39. Sliding panel in armour-plated bulkhead
98. Armour-plated bulkhead
45. Armour-plated panel port control ring
63. Armour-plated panel starboard control ring
6. Shoulder straps
100. Starboard sliding window
101. Port main plane leading edge
102. Centre section front spar



*Top: From the AP. TNA.
The engine operating instructions brass plaque. James Kightly.*

CANOPY

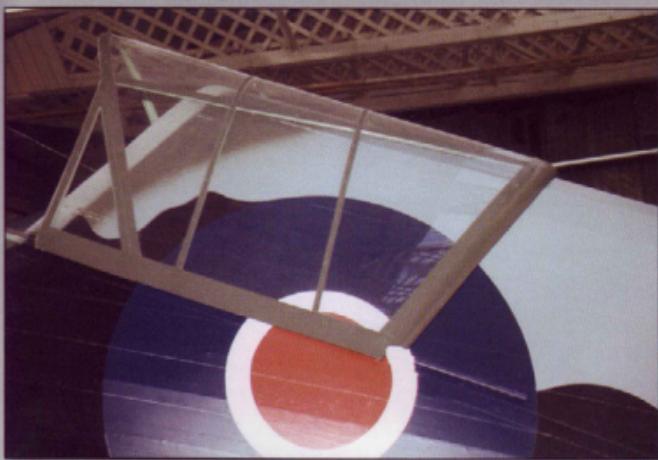


Top: A good view on the canopy of the Canada Aviation Museum (CAM) aircraft. Cam Harris

Middle: From the opposite angle on the IWM aircraft. Note how light the framing seems in comparison to contemporary fighter aircraft. MMP.

Bottom: A rear 3/4 view on the RAF Museum's Lysander. The rear of the extra 18 gallon oil tank is visible inside the canopy. MMP.





Top left: The observer's canopy slid aft and, (inset) detail of the rail. James Kightly



Middle: Looking forward showing the reflector gunsight and top of the side screen slid down. James Kightly.



Lower: The pilot's canopy top slid forwards and closed, with the blast tube for the observer's Very pistol visible. MMP.

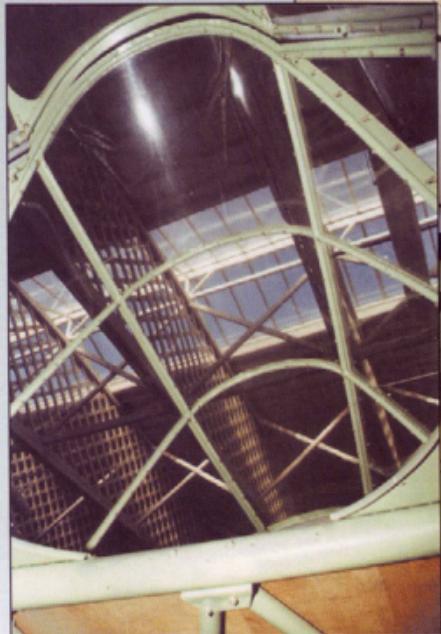


Views of the pilot's canopy structure.

Middle right: The view from the observer's position with the canopy top slid partly aft. And late style observer's canopy on the RAF Museum aircraft half open.



Bottom left: The observer's canopy seen from inside. All MMP.

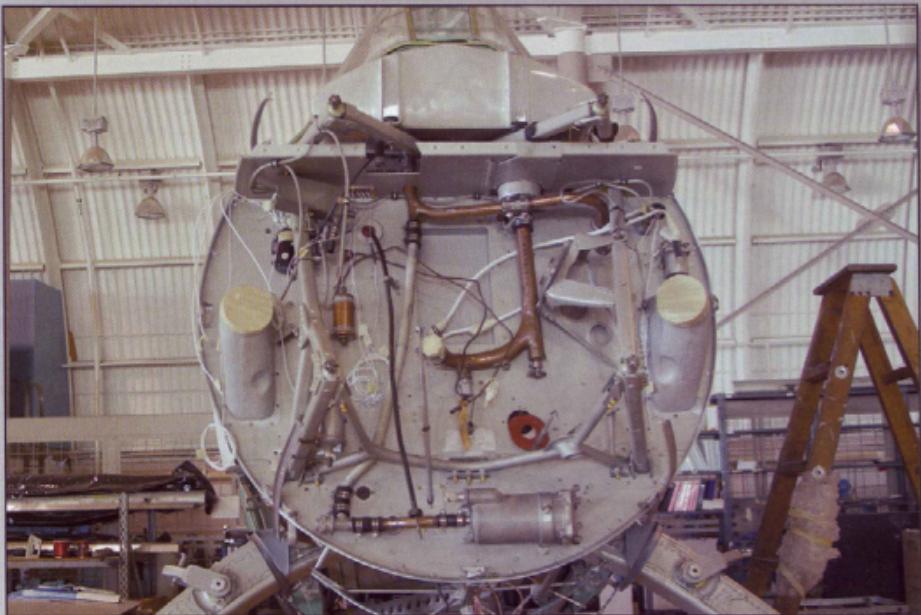


ENGINE



A comparison of the engine installation of the Shuttleworth aircraft and (below), the CWH example. Plenty to note, including the different colours of the exhaust collector ring on the active aircraft. James Kightly & Jim Buckel.

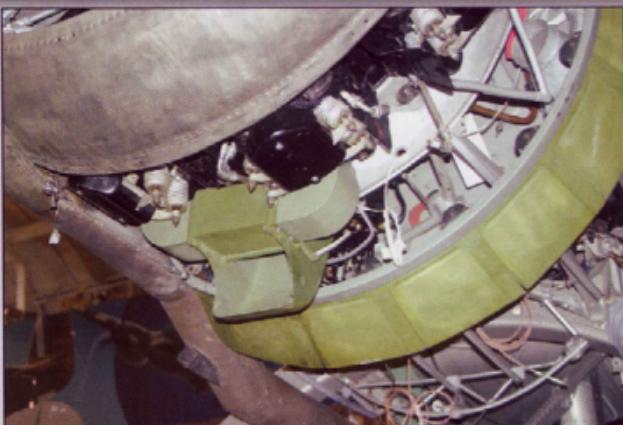


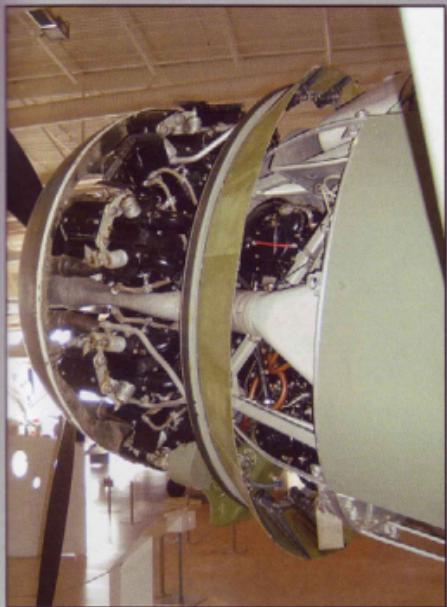


Top: A view of the engine firewall, and shelf with the oil tank fitted. Jim Buckel.

Middle: The incomplete small, adjustable carburetor air intake. James Kightly.

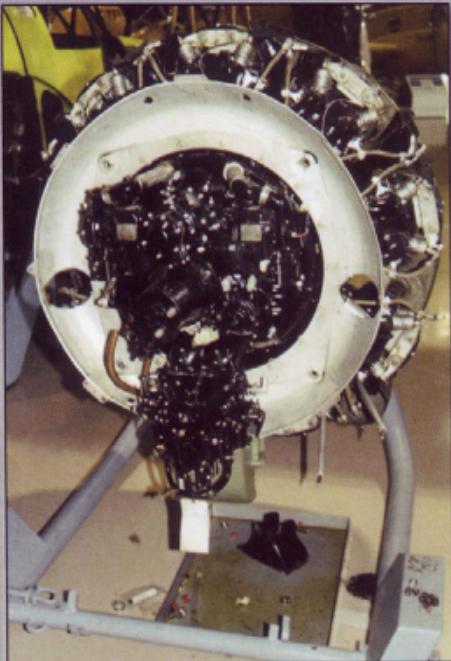
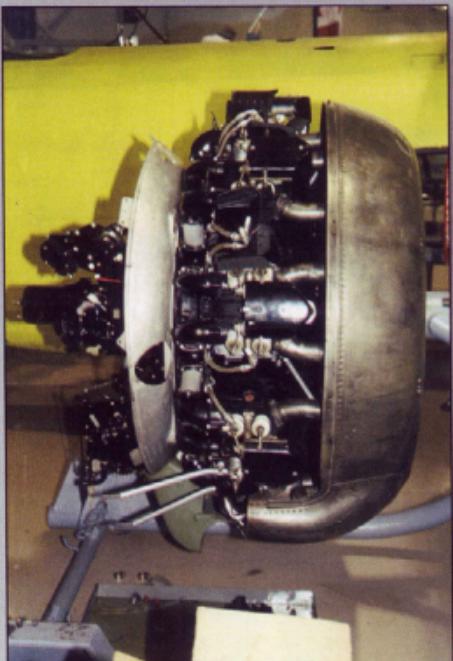
Lower: The fixed carburetor intake style. MMP.





Clockwise from top left: a view of the engine with the panels removed and cowl flaps fully open on the CWH example under restoration. Jim Buckel. The exhaust collector ring on the CAM example. Note that this has the internal heating jacket fitted to Canadian Mercury engined aircraft. Compare to the external jacket on the Canadian Perseus engined machines, seen on page 143. James Kightly. The complete carburettor air intake on the Langley machine. James Kightly. A view into the engine through the open cowl flaps on the Shuttleworth aircraft. James Kightly.

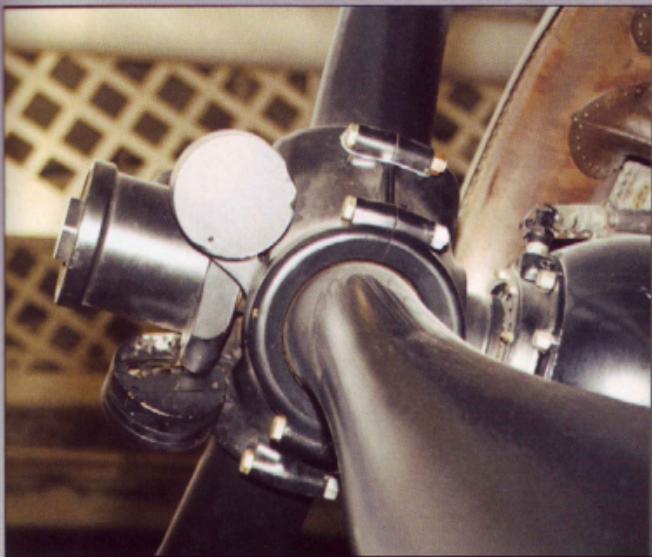




Above: Two views of the CWH Lysander's Mercury engine before fitting. Note how far aft the auxiliaries protrude.

Right: The complete engine cowl flap ring. On the Mercury-engined Mk.I and Mk.III this had a cut out scallop at the top for the slope up to the windscreen. On the Perseus-engined Mk.II, because the Perseus was shorter and mounted further forward, the cowl flaps needed no cut out. All James Kightly.



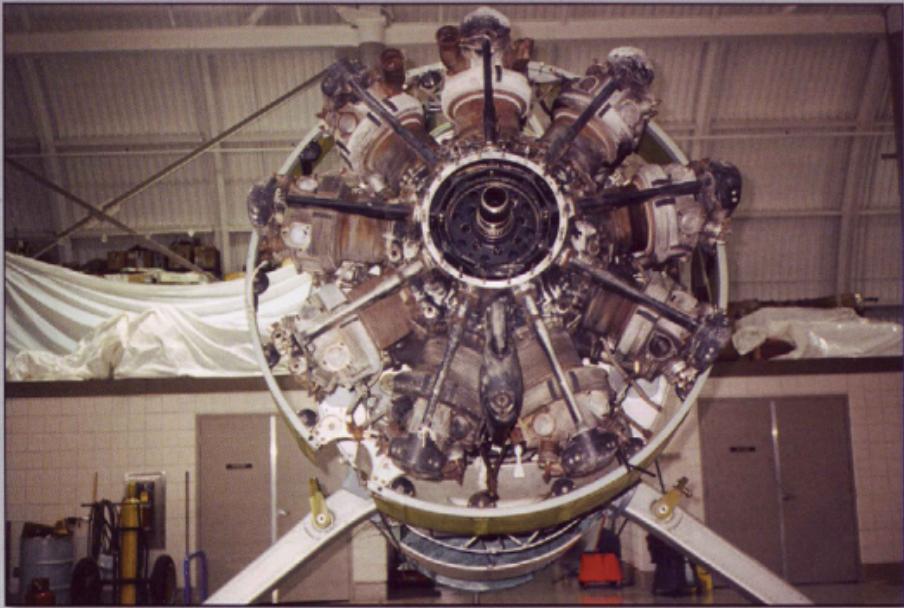


Top: The propeller hub showing the mass-balance weights. MMP.

Middle: The propeller spinner as fitted to the RAF Museum example. Note also the colour change in the exhaust pipes from the cylinders to the collector ring. MMP.

Bottom: The exhaust collector ring. Although similar to that fitted to the Gladiator and Blenheim (for instance) this only has one exhaust outlet. James Kightly.

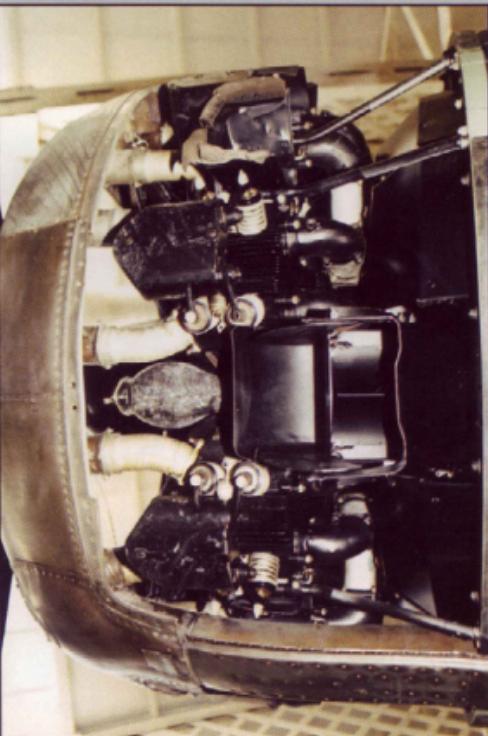
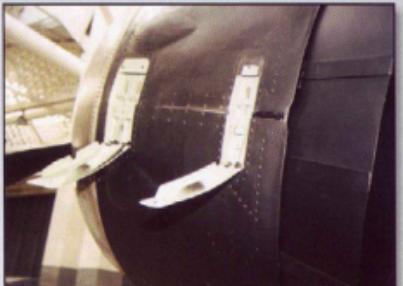




Top: The Mercury engine fitted, but without any cowlings or exhaust. Jim Buckel.

Right: A direct underside view of the IWM Lysander, with the carburettor air intake in the middle, and a good angle showing the flattening of the exhaust pipe (at the bottom of picture). MMP.

Below: The cowling latches one set at the lower port side, the other, at the top starboard. MMP.





Three views of the lower cowling section, showing the straps that hold it in place over the flattened section of the exhaust. All MMP.





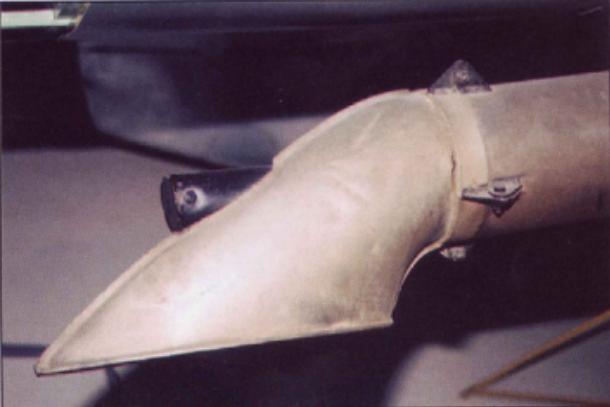
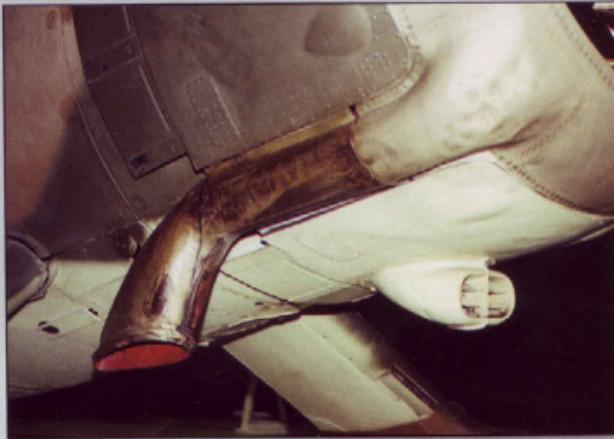
There is a considerable variation in the types of exhaust of the surviving Lysanders. Clockwise from top left: The long Canadian type on the CWH machine. Jim Buckel.

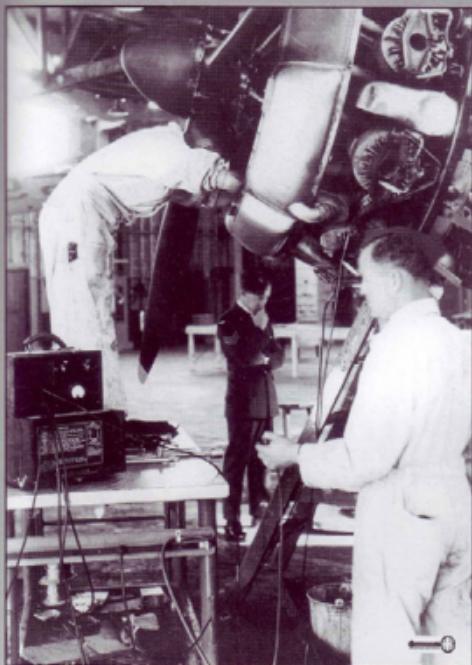


Two different lengths of the shorter UK version on the Shuttleworth and RAF Museum machines respectively. MMP

The end of the Canadian style. MMP

A view down the length of the Canadian type exhaust on the CAM example. James Kightly





There are no surviving Mk.II Lysanders, so we have only historical information on the configuration of the Perseus engine. These two photographs clearly show the Canadian modification to enable the heater to be fed from an external jacket attached to the lower port quarter of the Perseus collector ring, as, presumably, there was not enough room for an internal fitting as on the Mercury-powered aircraft. Note also that the oil cooler air intakes (one visible in the lower photo) inside the front ring are 'D' shaped and attached to the collector ring, rather than round as on the Mercury aircraft. Heritage Resources, St John, N.B.

Inset: The Perseus nose taken by Bristol's Transport Archive.



WING

Westland Lysander



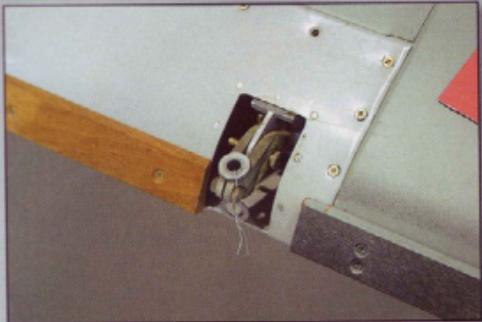


Top: A shot showing the inter-connected flap and slat arrangement. One of the pilot's actions on boarding is to push the slats in to raise the flaps. Note that the outer slat here is not deployed. James Kightly.

Left: The flap hinge neatly integrated into the strut root. James Kightly.



Previous page: Three good views showing the aerodynamic effect on the fabric of the wing, both on the upper and lower surfaces. The Lysander's unique double trapezoid wing shape is unmistakable. All James Kightly, lower right Nick Blacow.



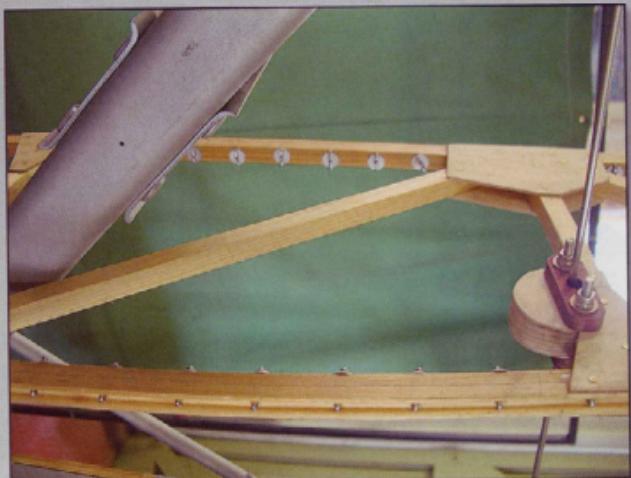
Top, left: The slat mounting and wing leading edge without the slat fitted. Jim Buckel.



Top, right: One of the ID stamps on the wing strut. James Kightly.

Middle: A close up of the wooden ribs on early Westland built machines. John 'Smudge' Smith, ARC.

Bottom, left: The original style wing inspection holes, albeit with new release fasteners, on the CWH machine. Jim Buckel.



Bottom, right: An overall view of the early Westland starboard wing with the false rear spar and framework of the port wing in the foreground. Brian A Marshall.





Clockwise from top left: The detail of the slat – notice the two runners. James Kightly.

The pitot tube, the simple 'L' shaped version. MMP.

Detail of the slat-flap interlinking mechanism. James Kightly.

Detail of the wingtop, light and fabric stencil. James Kightly.

This view shows how far forward the slats move to maximum extension. MMP.





Clockwise from top left: Two views of the flap hinge showing how well faired in it was when closed, at the high speed end of the envelope. MMP.



The junction of the front strut with the root fairing missing, but the tie-down loop. James Kightly.



The inboard section of the star-

board aileron and trim-tab. MMP.

The pitot tube on the skele-

tal wing of the CMF Lysander

showing the connection into

the wing. James Kightly.





Showing the interface between the aileron and the flap, with the fabric stencil location. MMP.

Lower: Three good views of the CWH machine during painting, showing detail of the wingtip light, number details and flap cut-out, as well as the tip thickness of the wing. All Jim Buckel.





Top left: The wing root section after the wings have been hung but before the fairings have been fitted. James Kightly.

Top right: The wing interior seen here test fitted on the CWH aircraft. Note that the slats are not yet fitted. The lightness of the section is very evident. The front section is metal covered. Jim Buckel.

A close up of the wing bolt to the carry through and attached to the main fuselage frame below. The cover panel to the flap is visible. James Kightly





Top: The port wing on the Langley aircraft, which is completely fitted out, unlike the CWH example of the previous page. James Kightly



Below: A view of the CWH wing-root showing the inboard flap hinge. James Kightly.

TAIL



Top: An overall view of the rear fuselage. A much more complex configuration than it initially appears. James Kightly.

Right: A good direct side-on view. Note the set of the horizontal tailplane. James Kightly

Bottom: The CWH Lysander fin shown separately while being painted. The mounting points are clearly seen. Jim Buckel.



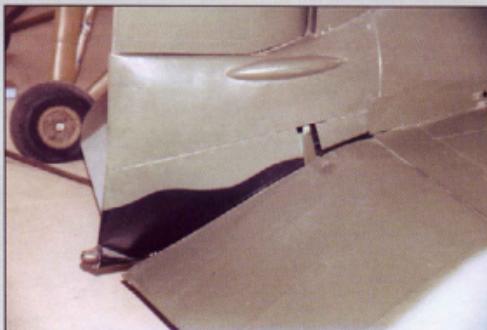
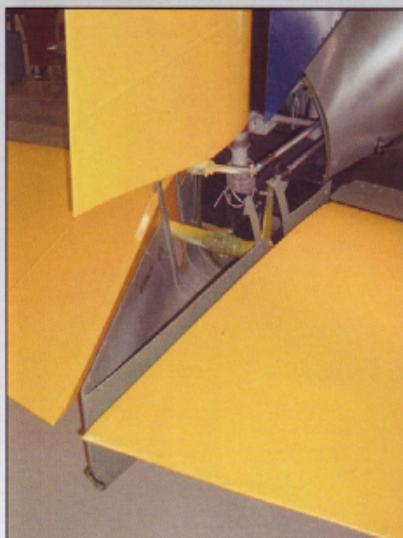


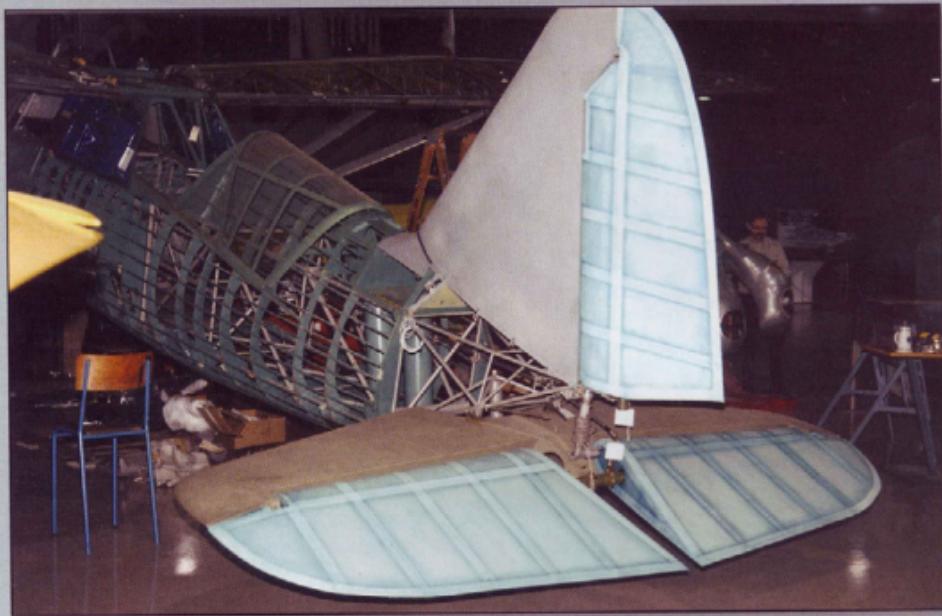
The IWM aircraft showing the tail light, and the slot for the elevator torque tube. James Kightly.

On the CWH Lysander, when the upper cover is removed, the supporting geometry can be seen. Jim Buckel.

Clockwise from top left: The horizontal tailplane of the CWH example, showing the light metal elevator shrouds, positioned over the fabric. Jim Buckel.

*The two elevators join with a torque tube (seen here for painting in the CWH example). Jim Buckel.
The tail of Shuttleworth's machine, with painted on trim indicators. James Kightly.*

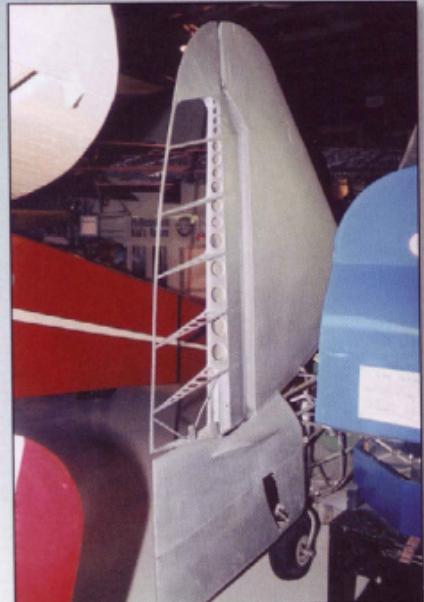




Top: Showing the metal covered fin and horizontal tailplane and fabric covered elevator and rudder of the CWH example. The doped fabric pattern is as it would have been during wartime production, but brick red rather than green, which is a modern material. Cam Harris.

Bottom left: The uncovered rudder of the Langley aircraft. James Kightly.

Bottom right: A view directly up the tail surfaces, showing how the fuselage comes to a flat vertical edge. James Kightly.





Clockwise from top left:
A close view of the Canadian style round inspection port



for the c-of-g weights and the stencils on the hatches, seen here on the Canadian Aviation Museum's aircraft. James Kightly.

The fuselage trailing edge and light. MMP.

The tail section with the metal covers removed – the lightness of the construction is evident. Jim Buckel.

Another profile view of the fin and rudder, with the fabric stitching and covering highlighted. MMP.

UNDERCARRIAGE



Top: Two airworthy Lysanders at Duxford show the configuration of the spats clearly, and also the covered and uncovered wheel arrangement. None of the survivors have the mud-scraper fitted, and the hub cover is missing on the nearer aircraft. James Kightly.



Upper: A good angle from aft showing how streamlined the spats were. MMP.

Right: Another view of 1244 'V9545' showing the wheel covers fitted. James Kightly.



Top & Middle: The inside of the port and starboard spats, with the Browning .303 gun breech covers opened and folded down (dummy guns fitted) and being fettled to fit. This was a hand-built item and there seems to have been some variation in the spat's shape. Note that the upper spat is more complete (and reveals less of the interior than the lower item. This is a good example of the care that went into the Lysander's detail design. Jim Buckel.

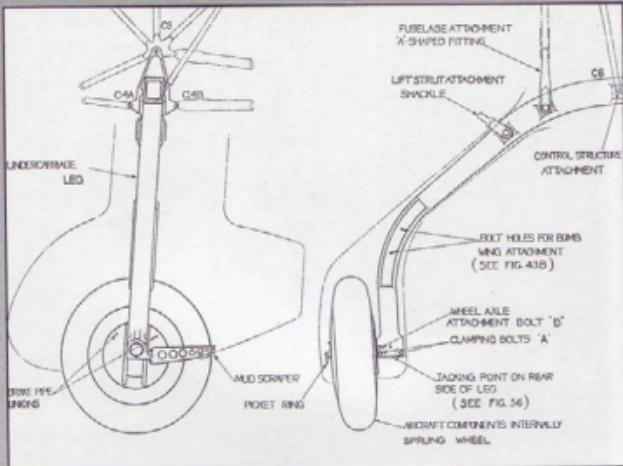


Bottom: A good photo to show the Dowty patent hub-contained shock absorber, a very unusual design feature, leading to much confusion in many accounts. The undercarriage beam had some suspension properties but the real work was done inside the wheel. James Kightly.



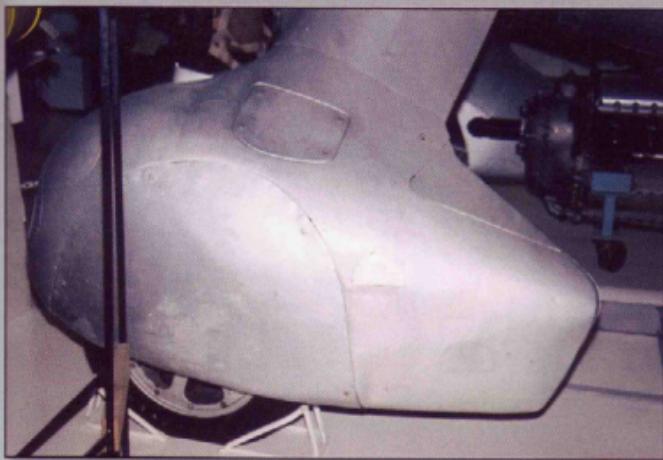
Top: A useful drawing showing the geometry, attachments and parts of the undercarriage. Westland Archives.

Middle & bottom: Two views of the starboard spat on the Shuttleworth machine. The spat's shape is very subtle and can look very different from slightly different angles. MMP.



Below: The Dowty wheel hub.
James Kightly.





Top left: The spat on the Langley aircraft. The cover over the stub wing attachment point is clear here. James Kightly.

Top right: A detail of the landing light. MMP.

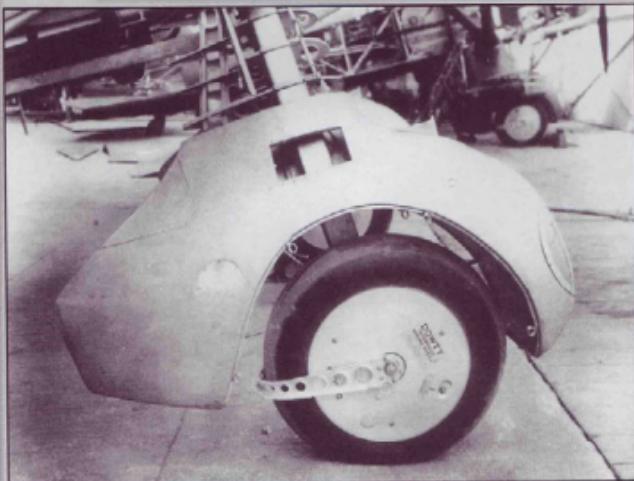
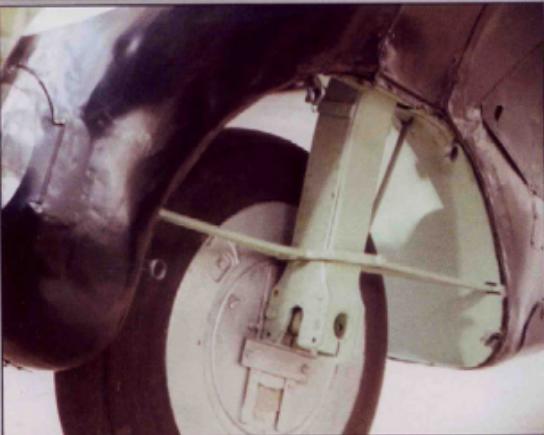
Right: The port wheel of 1244, showing the ground position of the wheel, Dowty shock absorber partly loaded. James Kightly.

Bottom: An inside view of 1244's inside wheel face, showing how far down the hub the beam sits when on the ground. MMP.



Clockwise from top left: The wheel hub of the CWH Lysander clearly showing hard to find details. A Lysander undercarriage beam at Old Warden, with the fuselage and strut attachment forgings fitted. The chair gives scale to this large, tough item. The inside face of the IWM's aircraft with the oleo lock clearly visible across the axle-rod's track. This wheel position would normally only be seen in the air, not on the ground, even with a lightly loaded aircraft. All James Kightly.

An official Westland photograph showing the fitted mud-scraper and 'Dowty' details on the hub cover (not usually seen on modern machines) and the skeleton of the leg fairing. The text reads: "DOWTY INTERNALLY SPRUNG WHEEL" (in stencilled text) with smaller text below and on the opposite circumference "DUNLOP" here, hidden under the mud scraper. It appears that there may have been two lengths of spat, this being the short version. Westland Archives. A direct upper rear view showing the gun-breech hatch closed and how the spat thins down to the end. MMP.





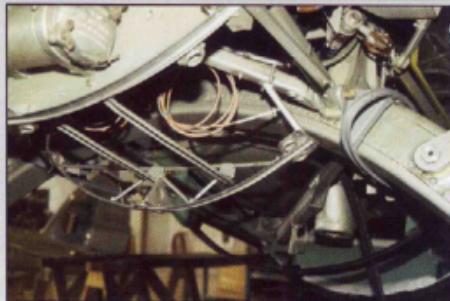
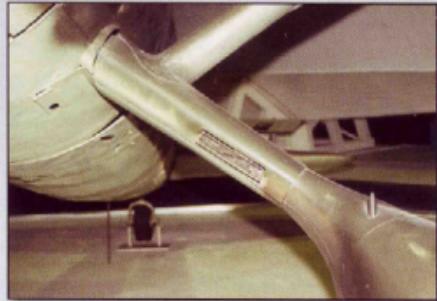
Right: A detail of the landing lamp on the Canadian Aviation Museum Lysander, showing the yellow spat marking. James Kightly.

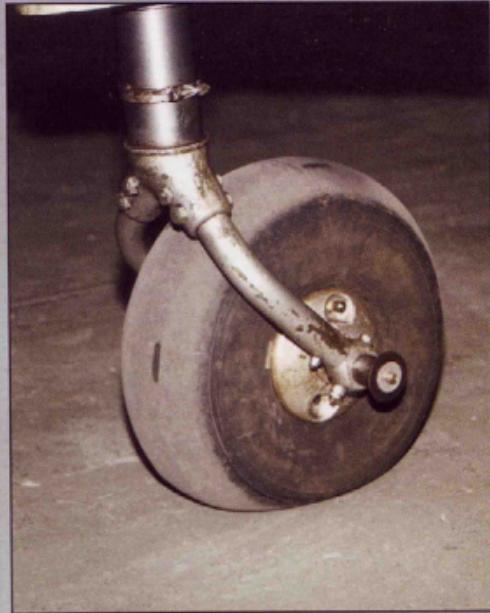
Above: The CWH Lysander has a test fitting of the starboard spat. A dummy .303 Browning is rigged up and the breech cover is hinged down. James Kightly.

Clockwise from below, left: The foot-step on the spat. MMP.

A view through the plate covering the stub wing attachment point, with the undercarriage beam visible on the right. James Kightly.

The fuselage, undercarriage and wing-strut joint with the fairing end-mounting visible. James Kightly. The air intake on the port leg on the RAF Museum aircraft. MMP



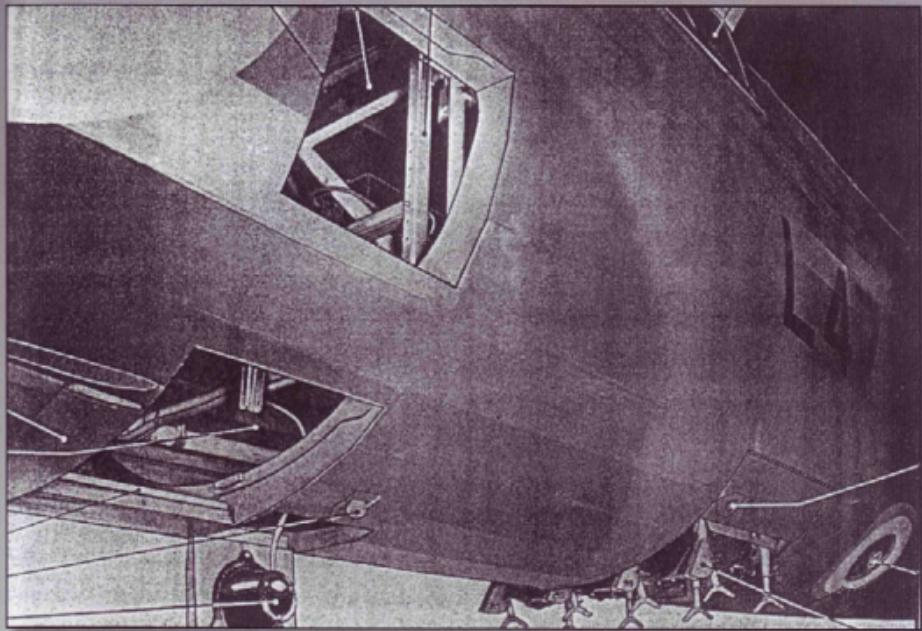


Three views of the tailwheel, often a vulnerable part of the aircraft in rough field landings. Note that the tyre has rectangular tread holes (top right MMP) and the way that the shock absorber extends right into the fuselage (top left, James Kightly), and below, how the fork is bolted together (and here has a steering arm attached) MMP.



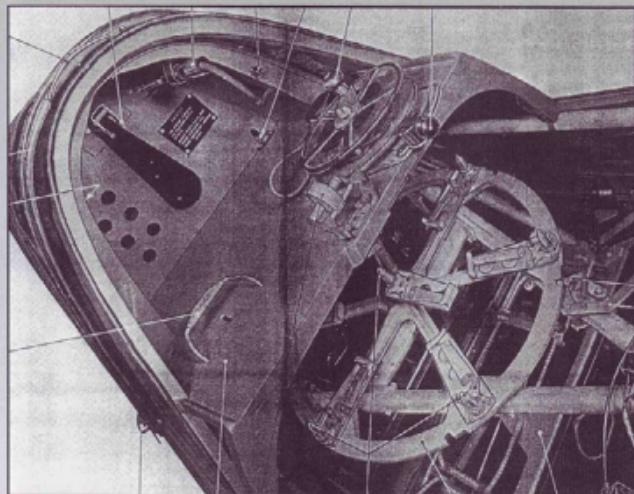
ARMAMENT

Westland Lysander



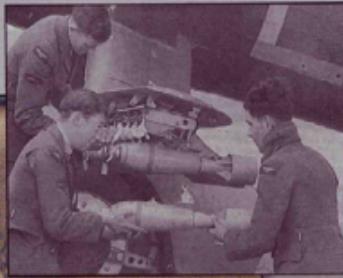
Top: A view of the rear fuselage, with the lower identification lamp hinged down for access, and the Mk. I Light series carrier (here "for flares or sighters") mounted in the rear fuselage cut out. The two large hatches in the foreground are for the camera, for oblique photography (upper) and vertical (below) – both the pilot and observer could aim the camera with sights through the floor. The disc on the lower right is the trailing aerial fairlead. TNA.

Looking aft in a armed aircraft cockpit – note that none of the survivors have been reconfigured to this fit. The main item is the turntable for the ammunition pans, designed to hold seven ammunition magazines, while the slot for the stowed gun barrel is visible in the rear bulkhead. The smaller wheel on top of the decking is the trailing aerial winch and gear, while the empty 'C' clamp on the left is the link and case bag stowage. TNA.

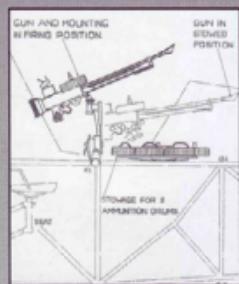
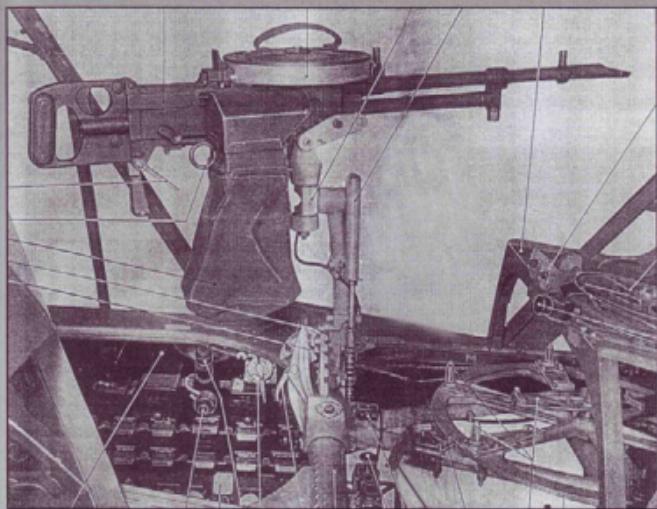


Top: On 31st May 1941, a Canadian airman demonstrates the twin Browning fitting of the Lysander Mk.IIIA; a great improvement on the single Vickers K but still not enough for really effective defence. The height of the gun's pivot, thanks to the ingenious arm arrangement is evident, enabling shots over the rear fuselage or from either side. This was also possible from the original mount as well. National Archives of Canada PA-063919.

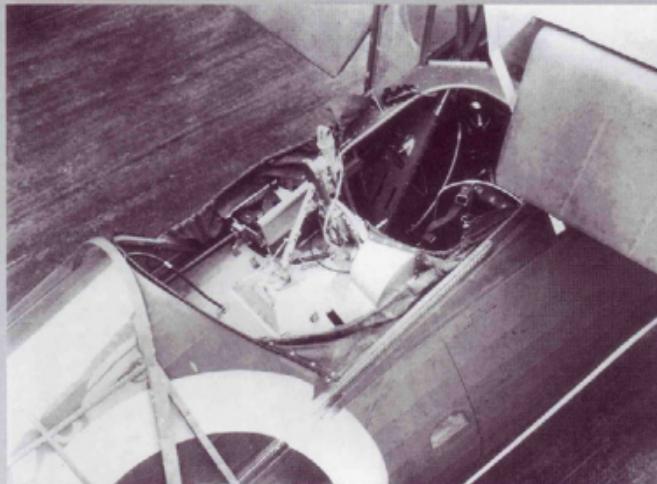
Below: An example of the ubiquitous Mk.1 Light series carrier with a 11 1/2 lb practice smoke bomb mounted, here painted blue. James Kightly.



Armourers loading bombs onto the rack on the stub wing while on exercises on Salisbury Plain. Pathé/ITN.



Top left: The Vickers K machine gun here without the gunsight fitted, and the spare pans missing from the turntable. The block in the lower left of the picture is the electrical instrument panel. TNA



Top right: the geometry of the gunner's armament is shown clearly here. TNA

Left: The pintle mounting of the 'A' variant, with screens and larger canopy shape. Westland Archives.

Below: Two shots of a Sergeant observer showing off the twin .303 Browning fitting for the press. Note the different ammunition feeds to the Canadian version on page 182. RAF Museum P7340/1.





A rare wartime colour photograph of a French operated Lysander after the French liberation. Note the field modification of a P-38 type drop-tank. Both Westland Archives.





*The Prototype Lysander K6127 as first completed and rolled out at Yeovil.
See drawing on page 18 for a list of the detail differences to production aircraft. Colours are doped fabric and unpainted metal.*



Lysander Mk.II of 4 Sqn RAF early 1939. The base scheme is the standard Westland factory applied 'even' number camouflage of Dark Earth and Dark Green, 'Aluminium' wing and tail undersides, and black serial numbers, with the then new squadron codes and spat marking added.



Lysander Mk.II L4767 of 13 Sqn is the subject of a famous photograph (see page 26) while working with the BEF based at Peronne, France. This machine finished its career in the Indian Air Force. Colours: Dark Green, Dark Earth and Sky.



Lysander Mk.II NI294 while serving with 225 Sqn in mid 1940 was the star of a number of Press day photographs and film while the unit was undertaking exercises on Salisbury Plain. Colours: Dark Green, Dark Earth and Sky.



Lysander Mk.II L4798 of 239 Squadron in 1940. This aircraft had served previously with 16 Sqn. and after its stint with 239, it went onto India. Colours Dark Green, Dark Earth and Sky, with a notably oversize roundel on the fuselage, here broken by the oblique camera port being open and with a F.24 camera fitted. Note the observer's canopy is missing.



Lysander MK.III T1423 of 309 (Polish) Sqn, RAF in 1942, while based in Scotland.
Colours are the 'A' scheme, Dark Green, Dark Earth and Sky. Note that squadron
codes are yet to be applied.



Lysander Mk.IIA V9484 of 309 (Polish) Sqn, RAF in 1942-3 while based at Fife, Scotland. Colours are 'A' scheme, Dark Green, Dark Earth and Sky. Note that the Polish insignia is handed and not identical on each side of the fuselage.



Lysander Mk.IIA V9437 also of 309 (Polish) Sqn. RAF in 1942-3. The previous individual aircraft letter 'P' has been over-painted with a new designation. Colours Dark Green, Dark Earth and Sky, although the fuselage has the original wrap-around upper-surface camouflage.



Canadian built Lysander Mk.II RCAF 426 in a low visibility early RCAF camouflage scheme while at Vancouver. Similar to the RAF's colour pattern, with Dark Earth and Dark Green upper surfaces, the differences include a two colour fuselage roundel, and the 'Aluminium' paint applied on the fuselage underside as well as the wings.



Lysander Mk.II P9139 when serving at Kohat, on the North West Frontier Province of India with 28 Sqn in the latter part of 1941. The aircraft is, unusually, equipped with two Universal No.1 carriers on each stub wing, and the paint and finish is clean and well cared for, and under-wing is reasonably reflective.



Lysander Mk.II P9193 also of 28 Sqn, showing the variation in fin flash details. Colours as above.



Lysander Mk. II R1992 of an unidentified unit in North Africa, as used to convey Maj Gen Gurbachan Singh on troop visits. Lysanders in the desert started out with standard temperate schemes but were painted in desert colours as the campaign wore on. Colours Dark Earth, Mid Stone, Azure Blue.

Lysander Mk.II of the Irish Air Corps. This is still the delivery scheme, as painted by Westland. This is the scheme for odd-serial number aircraft, and the camouflage is identical to RAF practice. The original 1939 drawing of the mirror scheme for even serial aircraft survives, and a note states: 'The outlines surrounding the green, earth and day colours on this diagram are not to

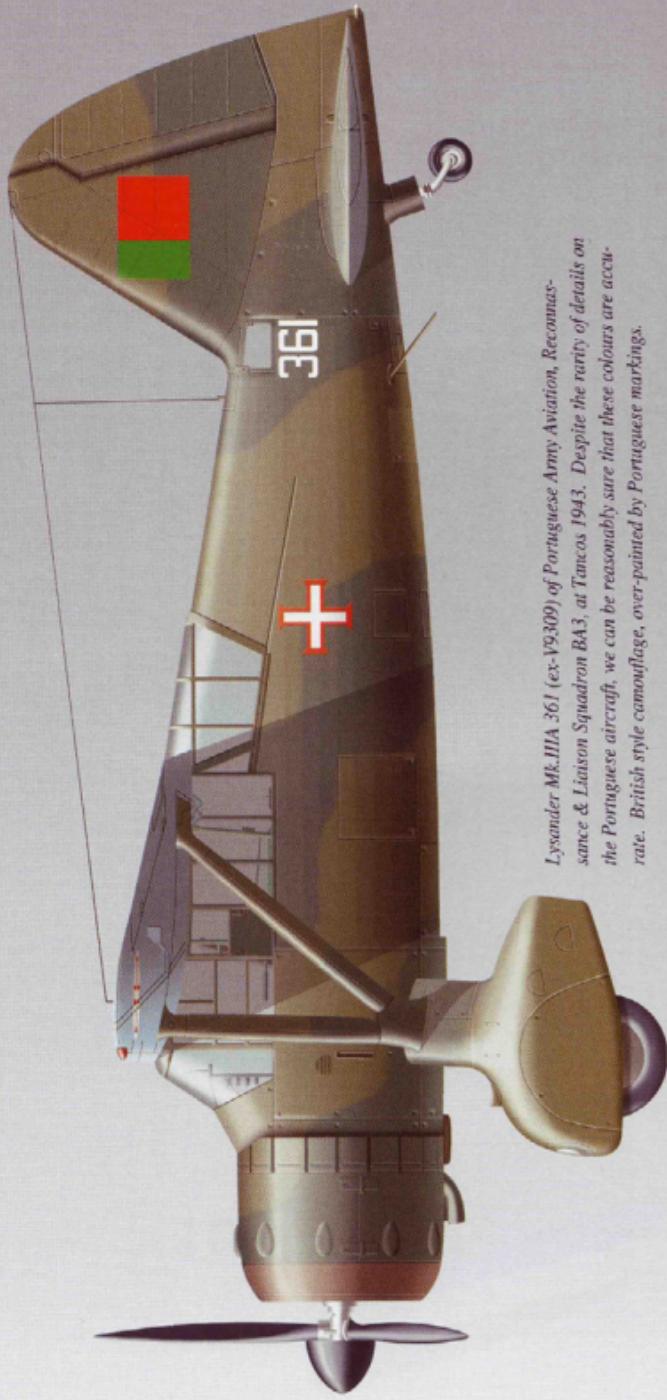
appear on the aeroplane, but the edges of the adjacent colours are to be merged.' It also stated propeller and tips yellow, the green for the markings is quoted as 'Titanine T.E.32' while the orange is 'Titanine T.E.78'.



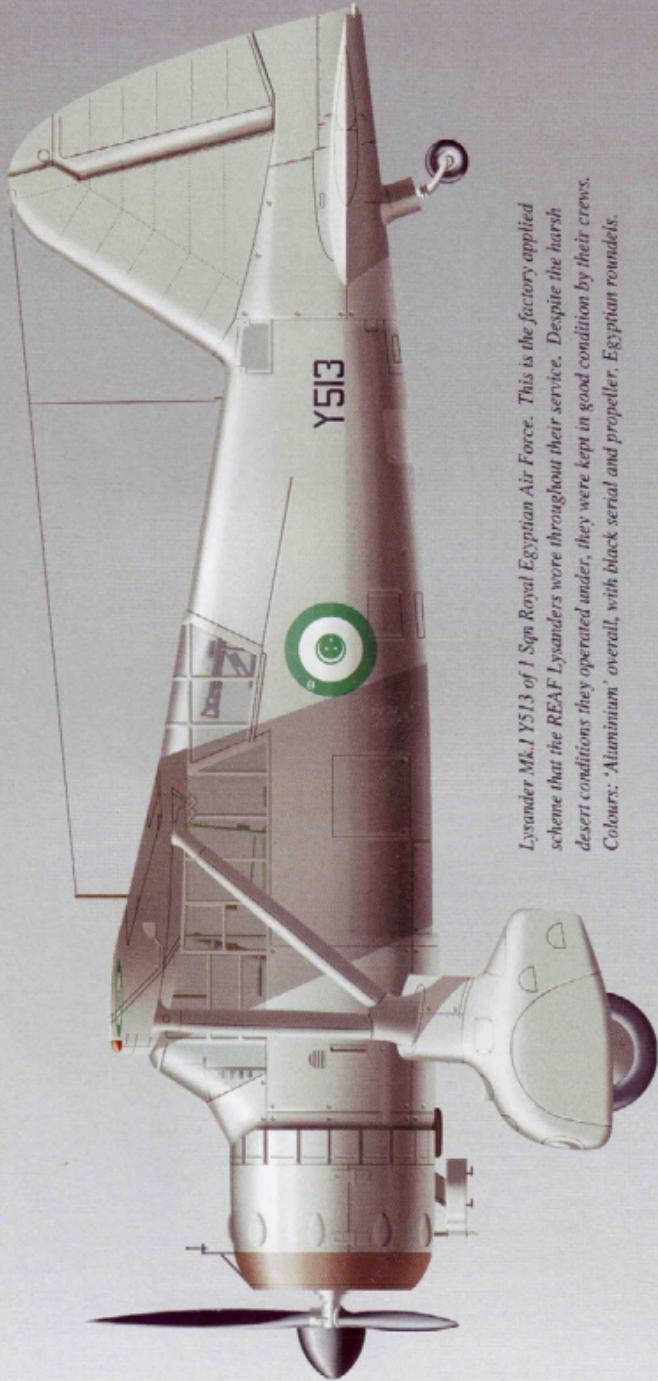
First Canadian-built Lysander Mk.II RCAF 416 in the early scheme seen in the fall (autumn) and winter of 1939. The profile depicts the aircraft in January, 1940, at Rockcliffe, Ontario (now the home of the Canadian Aviation Museum) when with 110 Sqn RCAF, with the oil-cooler heater modification (under the pilot's fuselage footstep) and with the wheel covers removed to avoid snow-binding. Colours are 'Aluminium' overall with black serials and propeller.



Lysander Mk.II (unidentified serial) of Escadrille "Rennes", Groupe "Bretagne" of the Free French Air Force, Fort-Lamy, Chad. This was a support unit to General Leclerc's Free French Saharan forces during 1941-1942. Standard RAF 'A' scheme, with French markings.

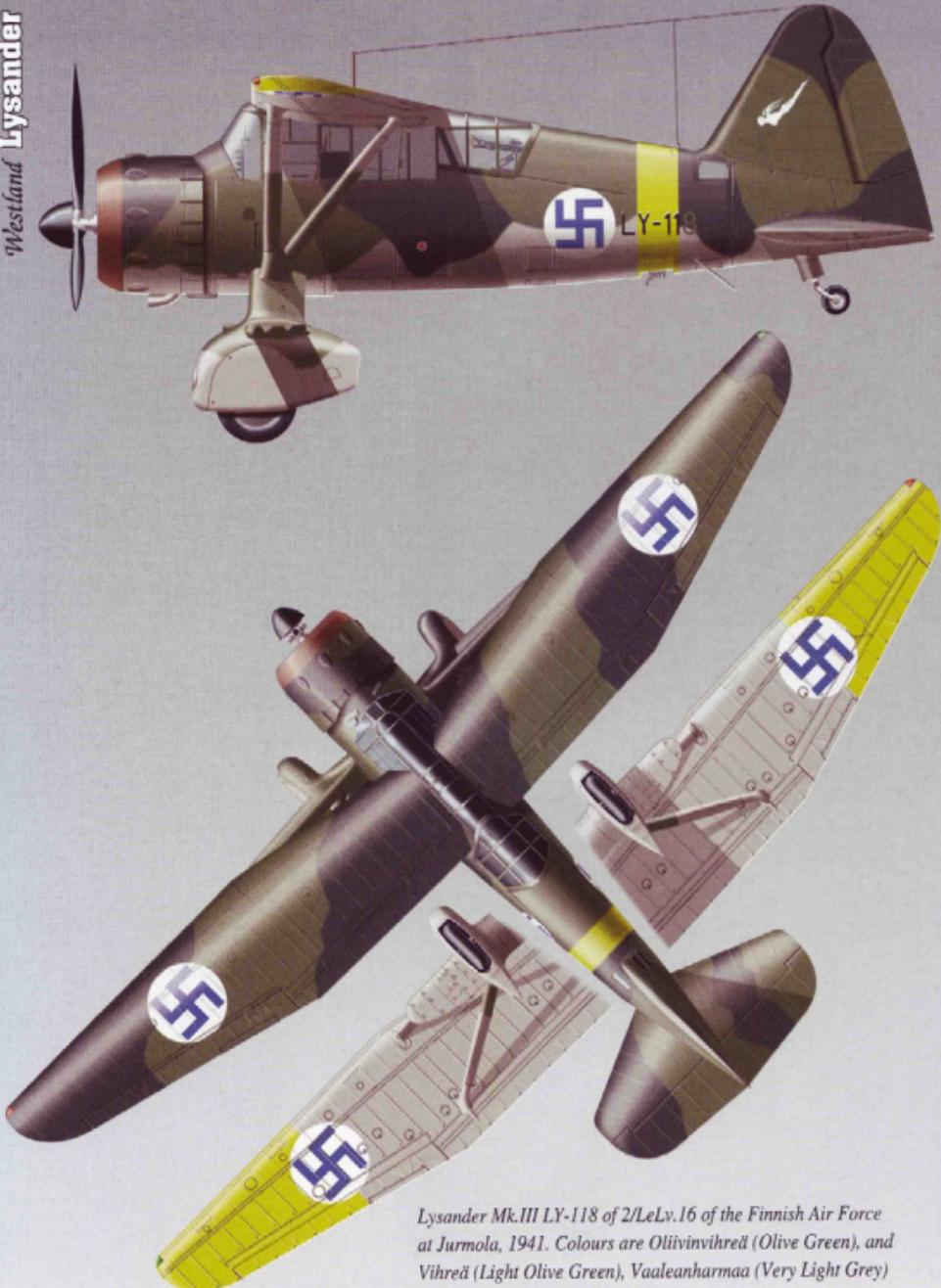


Lysander Mk.IIIA 361 (ex-V2309) of Portuguese Army Aviation, Reconnaissance & Liaison Squadron BA3, at Tancos 1943. Despite the rarity of details on the Portuguese aircraft, we can be reasonably sure that these colours are accurate. British style camouflage, over-painted by Portuguese markings.



Lysander Mk.I Y513 of 1 Sqn Royal Egyptian Air Force. This is the factory applied scheme that the REAF Lysanders wore throughout their service. Despite the harsh desert conditions they operated under, they were kept in good condition by their crews.

Colours: *Aluminium - overall, with black serial and propeller. Egyptian roundels.



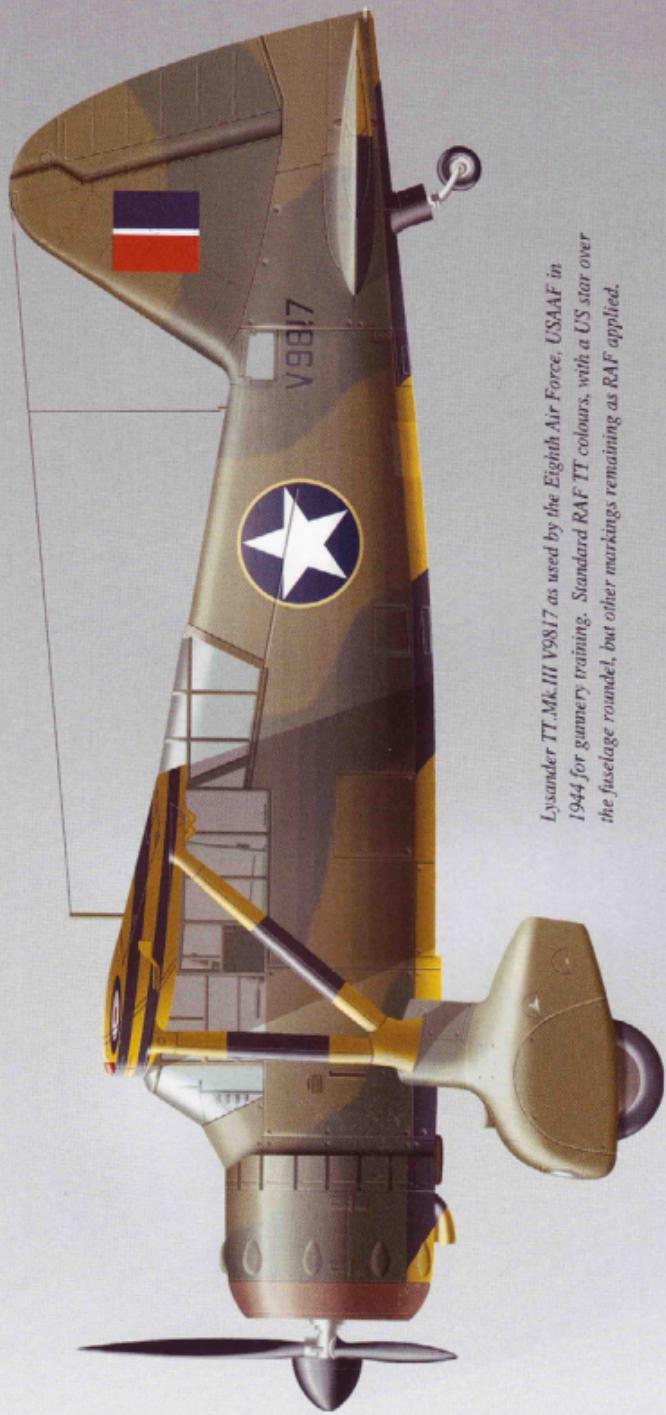
Lysander Mk.III LY-118 of 2/LeLv.16 of the Finnish Air Force at Jurmala, 1941. Colours are Oliivinvihreä (Olive Green), and Vihreä (Light Olive Green), Vaaleanharmaja (Very Light Grey) with yellow wingtip and rear fuselage theatre bands. The insignia on the tail is the unit mascot Lentävä Diana in white.



Lysander Mk.II 3106 as painted by Westland for service with Turkey, and as seen at Yeovil before dispatch. The aircraft is in standard RAF camouflage, Dark Earth and Dark Green with Turkish national markings and serial in black. Underwing serials, reading from the front on the port wing, and aft on the starboard, were applied, as well as black over-wing serials reading from aft on the port, forward on the starboard.



Lysander Mk.II 3122 in Turkish service sometime after delivery. The aircraft is still in the original delivery colours, the same as RAF Lysanders, but the fuselage serial number has been repainted in white, probably simply to make it easier to read from a distance on the ground. The aircraft still has black serials (in full) underwing and it is not known if the over-wing serials had been repainted in white from the original black.



Lysander TT Mk.III V9817 as used by the Eighth Air Force, USAAF in 1944 for gunnery training. Standard RAF TT colours, with a US star over the fuselage roundel, but older markings remaining as RAF applied.



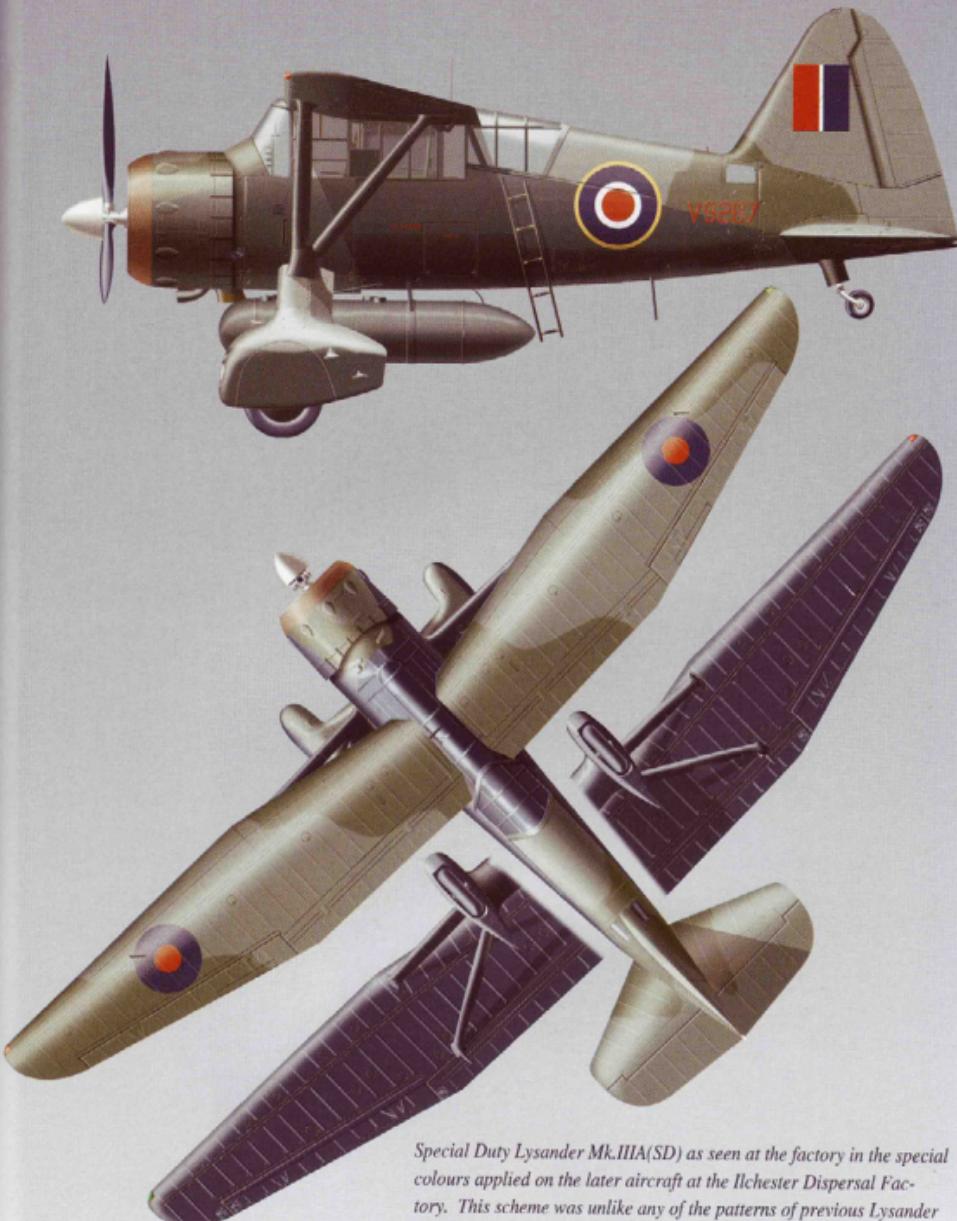
Lysander Mk.III V9547 of 277 Sqn as used for air-sea rescue. Note the dinghy pack in the Small Bomb Container unit, and the dent at the front of the spat. Colours: Navy style maritime scheme of Extra Dark Sea Green, Extra Dark Sea Grey and Sky. This scheme was initially very rough on the ASR aircraft, but was cleaned up as they became more established.



Lysander TT Mk.III V9323 was a built by Westland but shipped to Canada where it was used as a target-tug. Colours: Standard RCAF black and yellow TT scheme.



Lysander Mk.III (SD) of 357 Sqn, based at Mingaladon, Burma in 1945. Unlike the SD Lysanders used around Europe, the Far East aircraft flew in a much tougher environment and operational conditions, and the paintwork quickly reflected that. The UK applied SD scheme was modified with late SEAC "two blue" roundels and white serial. See the photograph on page 84.



Special Duty Lysander Mk.IIIA(SD) as seen at the factory in the special colours applied on the later aircraft at the Ilchester Dispersal Factory. This scheme was unlike any of the patterns of previous Lysander camouflage. In Squadron service, some aircraft had the upper colours extended down to a line 45° to the fuselage centreline, while early aircraft were matt RD-2 Night, or other more manageable black overall. Colours are Dark Green, Dark Sea Gray, Night Black, Dull Roundel Red and Dull Roundel Blue.



Lysander Mk.IIIA. TT V9502 was Westland built as the British serial number indicates, but was shipped to Canada in 1942. Standard Canadian TT scheme of yellow and black stripes.



Lysander Mk.IIIA TT RCAF 2424 was Canadian built, and is seen here when with 1. OTU at Bagotville, Quebec in the spring of 1943. Band around the rear fuselage may be a light grey or pale blue.



Lysander Mk.III TT V9295 of 755 Sqn Fleet Air Arm in 1941-2 period. This aircraft is shown on page 76 after losing a large piece of its wing fabric. This aircraft did not seem to be fitted with a winch at the time of the accident. A scheme with three different sources of origin. Standard mid war colours, with Royal Navy markings and TT underside yellow and black.

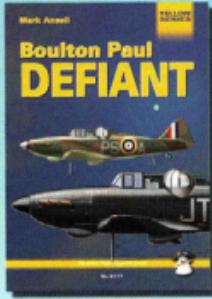
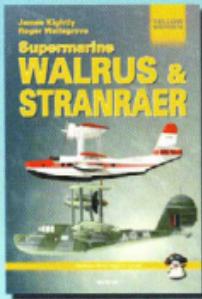
The most data about the Lysander in a single book.

The Westland Lysander became famous for picking up and dropping secret agents into Nazi occupied Europe on moonlit nights. Yet this was only one of the aircraft's many roles. Originally designed for Army co-operation, used widely in combat and training, it went on to become a founding member of the 'Salvation Navy' as an air-sea rescue aircraft and later use as a target tug. Brave men flew the Lysander from the cold of prairie Canada, to the jungles of Burma and the heat of the North African desert.



This book is the first ever to cover many previously undocumented aspects of the Lysander's use, with firsthand accounts from pilots and ground crew. The photographs were chosen from official archives and private collections, and from the UK, Europe, Canada and Australia. Many have never been published before. It also presents brand-new scale drawings and colour profiles, and information from previously unused sources. Full listings of performance, production, units and secondary users are also included. Many true stories are presented here for the first time, as well as the examination of myths and previously 'secret' information.

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