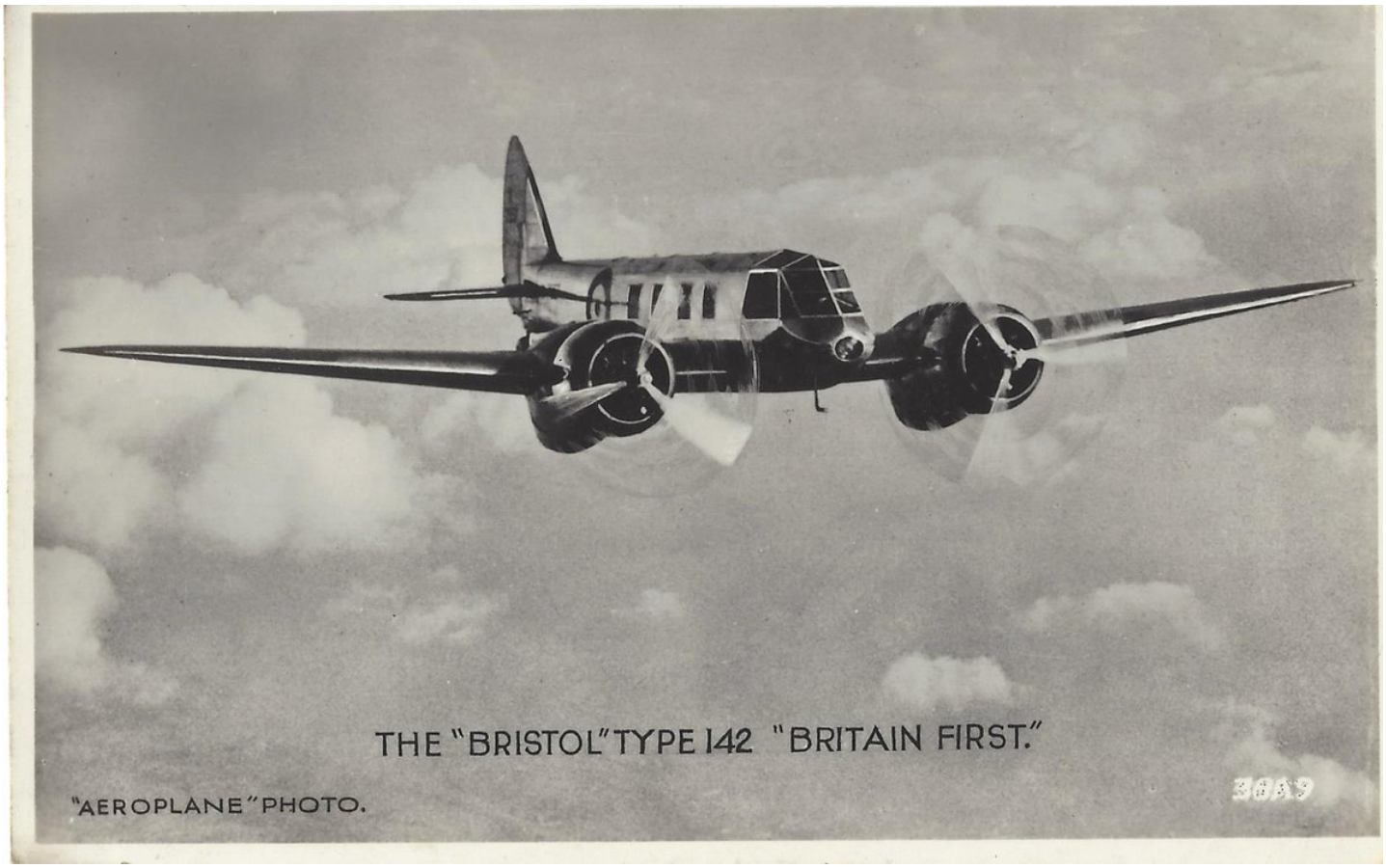
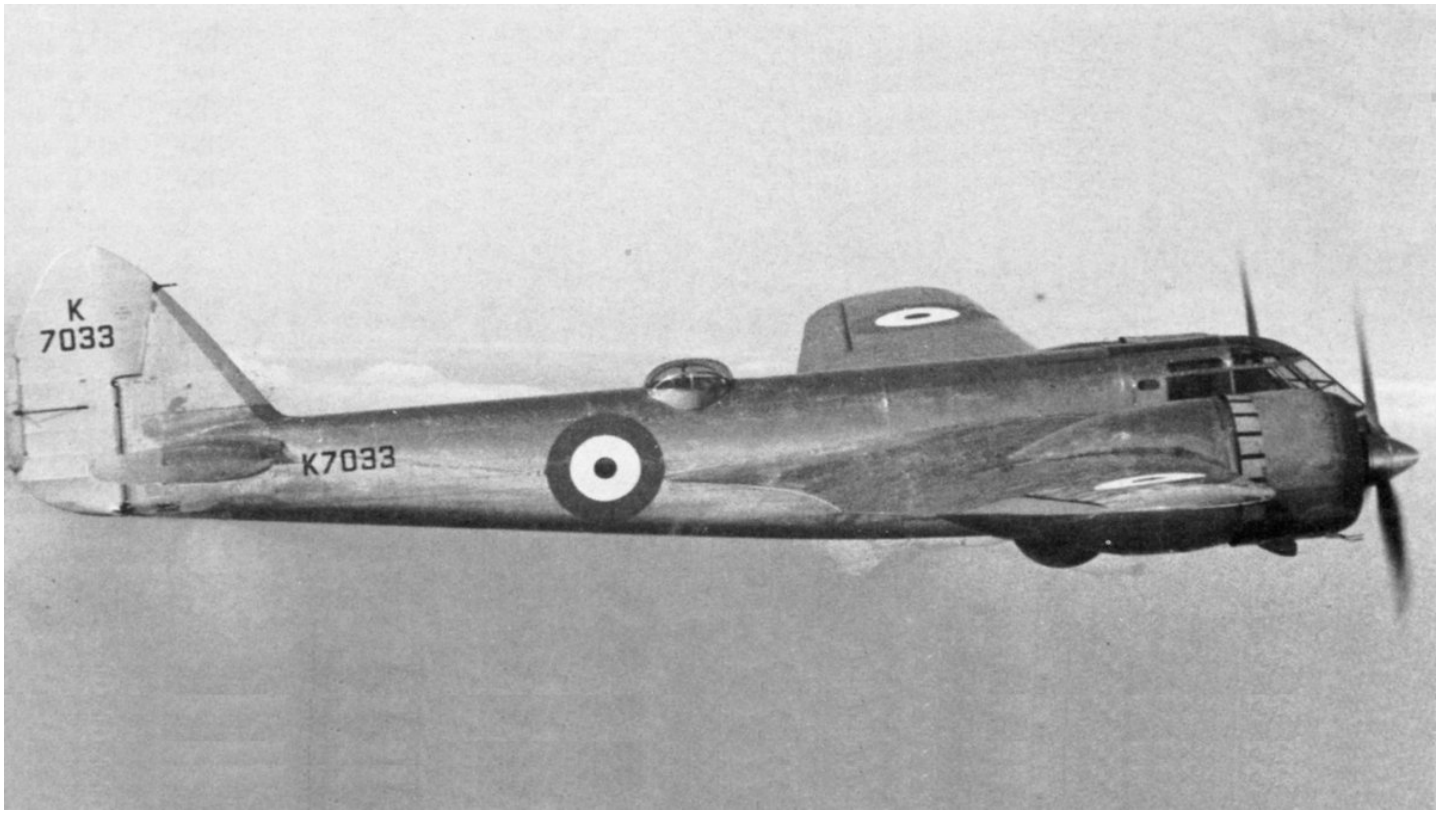
Twitter Thread by Stephen Moore

Stephen Moore
@smooreBofB1940

1. This is a thread about the Bristol Beaufighter & how it was the most important (if not the absolute 'best') heavy fighter of the SWW. Beaufighter origins go back to the Bristol Type 142 'Britain First' built as a publicity stunt for Daily Mail owner Lord Rothermere in 1935.

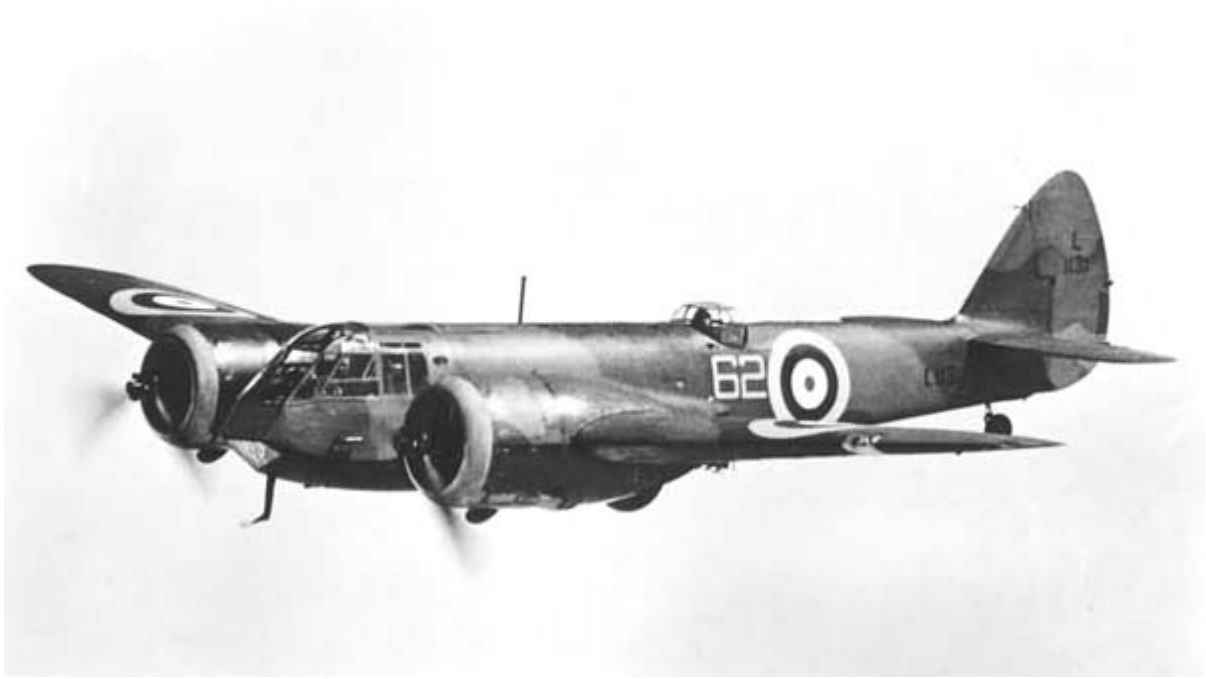


2. With a top speed of 278mph, this was considerably faster than the Hawker Fury, which could only manage 207mph. A specification for a fast medium bomber was issued for a revised version of the 142M, named the Blenheim.



3. By the time the war started all-metal monoplane fighters had eclipsed the performance of the Blenheim. Serious shortcomings in operational capabilities of all RAF aircraft were revealed during early wartime aerial activity, leading to heavy losses of aircraft & crews.

4. Lack of defensive armament, armour & self-sealing tanks were added to the problems of looming obsolescence. The huge number of aircraft ordered from shadow factories, along with delays to replacement models, kept the Blenheim in the front line much longer than it should have.

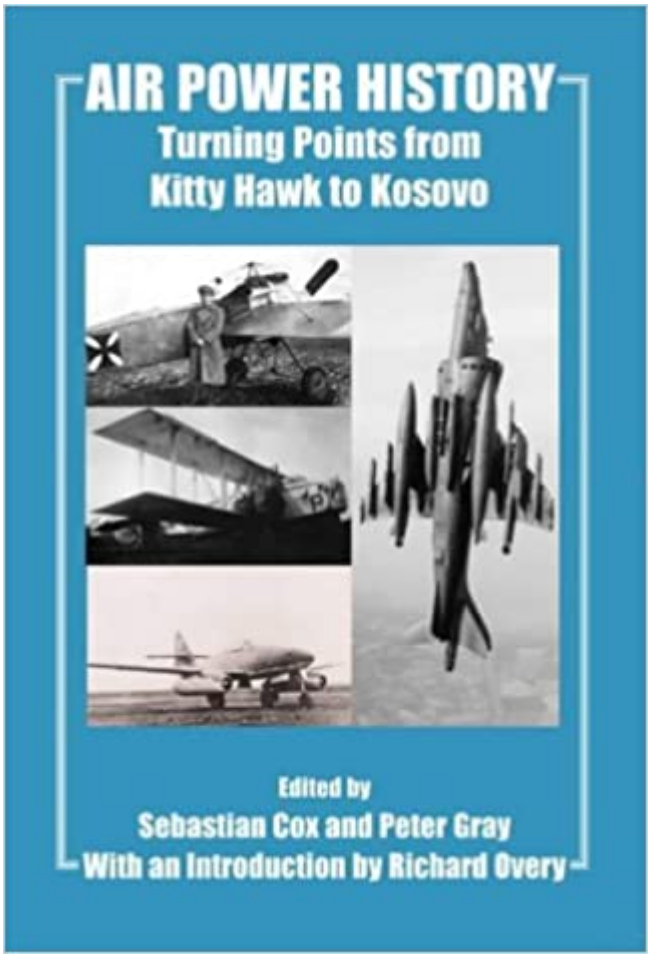


5. Fighter Command had 7 Blenheim IF squadrons at the outbreak of war. These were dual purpose day/night units, but by early 1940 were operating primarily as night fighters. The need to provide cover for east coast convoys led to the formation of 4 ‘trade protection’ squadrons.

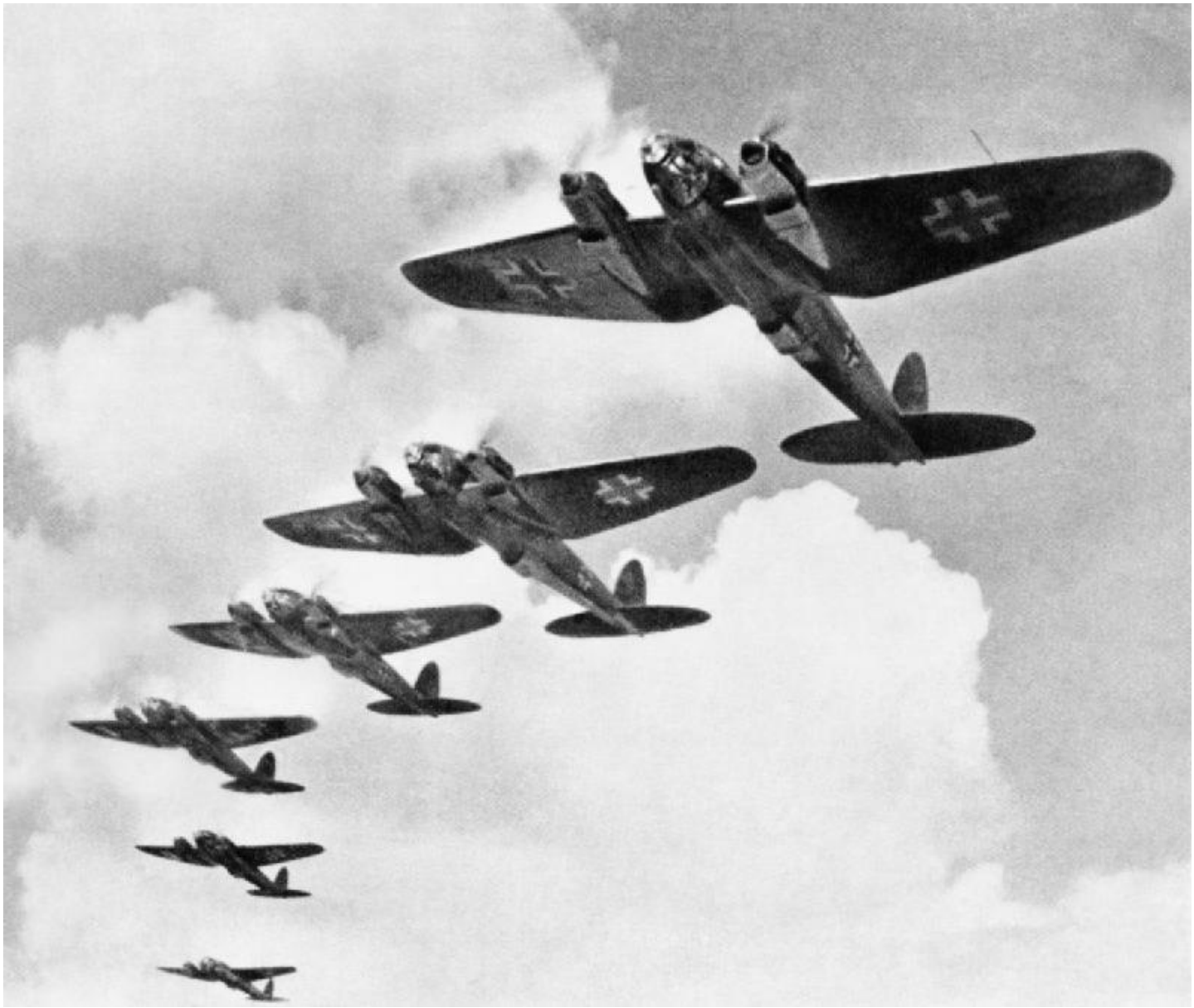
6. Concurrently, 21 Blenheims were equipped with Aircraft Interception (AI) radar in the Autumn of 1939. By early 1940 it was clear a faster, heavier armed aircraft and better radar were essential for night interception, & fortunately a better aircraft was on the horizon.

7. The design team at Bristol had followed up the Blenheim with the Beaufort torpedo bomber and the Botha maritime general reconnaissance aircraft (of which, the less said the better…).

8. John Ferris has described British air defence before SWW as ‘planned for a bad case but not the worst case’, against an enemy flying across the North Sea rather than being based on the other half of the English Channel.



9. Daylight attacks by unescorted Luftwaffe bombers were therefore expected, & in this context the Boulton Paul Defiant made sense, which would have prevented its disastrous combat record during the Battle of Britain.

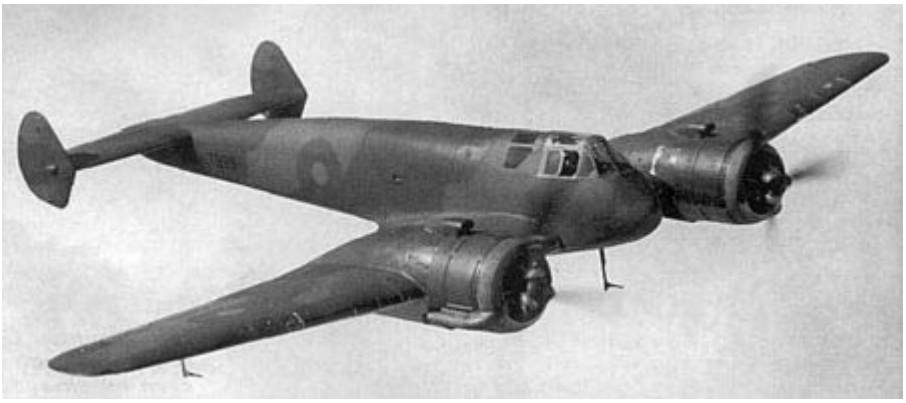


10. The development of a cannon-armed fighter was the next logical development, as the limitations of the rifle calibre machine guns used in the Spitfire, Hurricane and Defiant were becoming apparent.

11. Although the Westland Whirlwind, with 4 x 20mm cannon entered production, there were numerous delays due to the choice of Peregrine engines & problems with other aircraft systems.

12. The Air Ministry was not alone in proposing a cannon-armed ‘bomber destroyer’ - in Germany the Reichsluftfahrtministerium similarly specified the Bf 110 Zerstörer for the Luftwaffe.

13. While Gloster designed the F.9/37 from scratch, the Bristol project team proposed a ‘Beaufort Fighter’, utilising the wings, tail & undercarriage of the Beaufort attached to a new fuselage and Hercules sleeve-valve engines instead of the bomber’s Taurus.

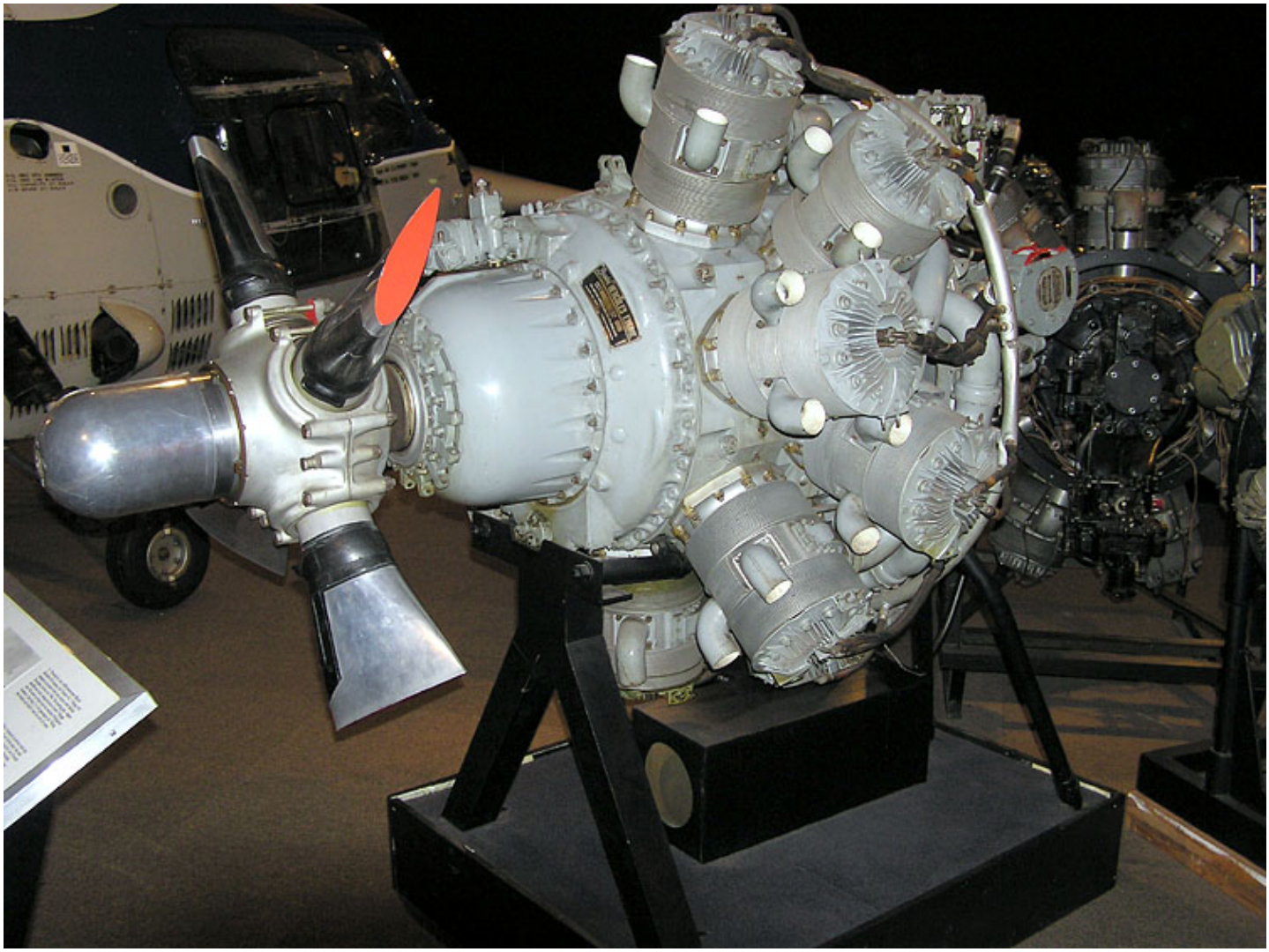


14. Although serious design work only started at the end of 1938, the re-use of Beaufort components meant that the 1st prototype was flying by July 1939. The name ‘Beaufighter’ was adopted from May, but was still being referred to as the ‘Beaufort Fighter’ into 1940.

15. From the start, it was always intended that a long-range version would be provided for Coastal Command use in addition to Fighter Command, demonstrating the multi-role abilities of the aircraft.

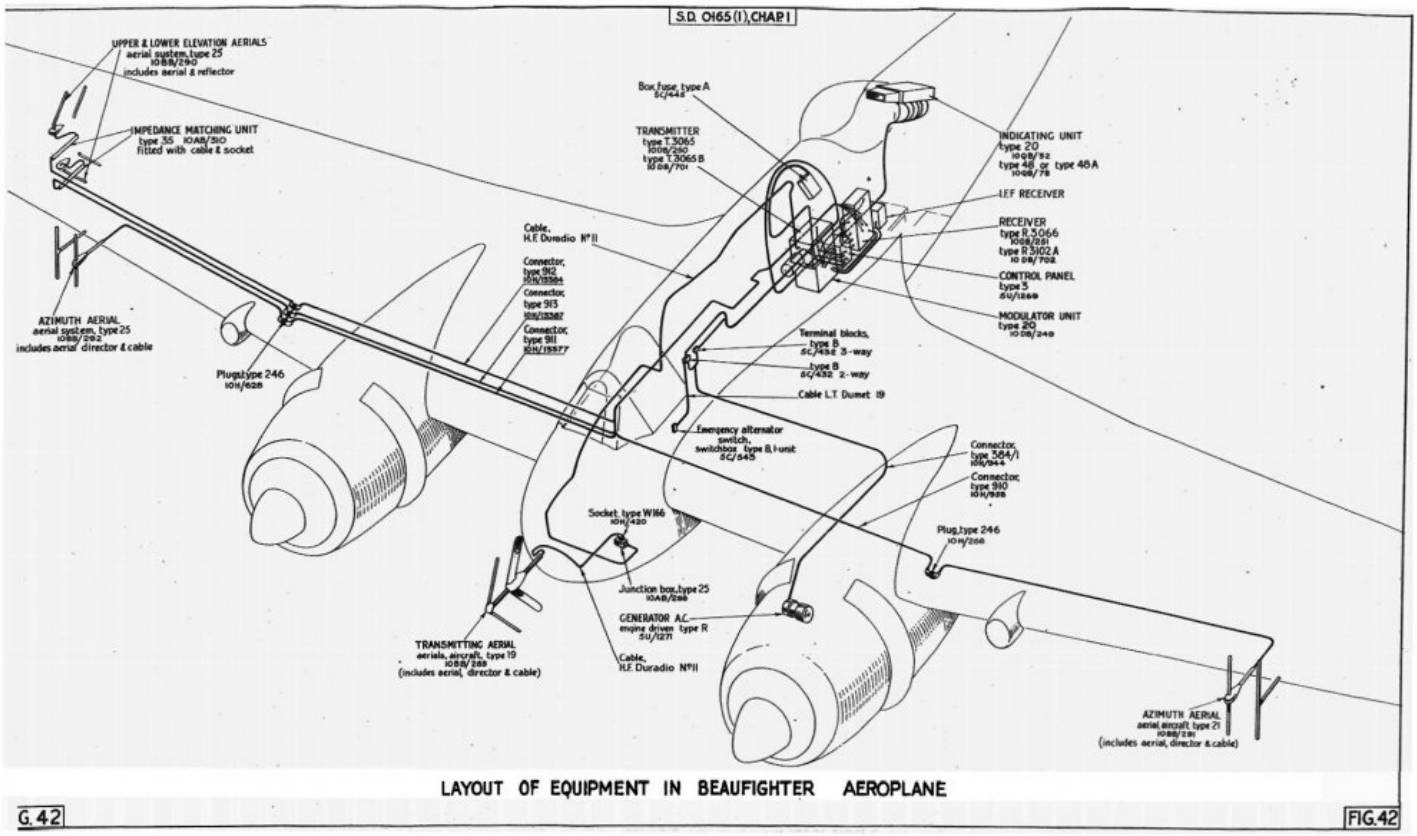
16. The limitations of Blenheim night operations over the winter of 1939 made the Beaufighter an obvious replacement, but the unprecedented speed of development meant a whole range of teething troubles were not resolved before the aircraft entered service.

17. The Hercules VI, using 100 octane fuel was intended for the Beaufighter but in June 1939 delays to this version meant that a batch of aircraft would be supplied with Hercules IIs, as well as subsequent aircraft fitted with Hercules IIIs.



18. Compared to other 1st-generation monoplane fighters, the Beaufighter entered service much earlier in the RAF. Despite flying for the first time 10 months after the Whirlwind, the Beaufighter was in extended service before any of the previous fighters began operations.

19. The optimisation of the Beaufighter, AI & GCI radar into an integrated weapon system was not possible before active service, but was performed during operations against night bomber raids over the UK during the winter of 1940-41.



LAYOUT OF EQUIPMENT IN BEAUFIGHTER AEROPLANE

G.42 FIG.42

20. Lack of experience in using AI limited interceptions, but serious faults with the equipment itself did not help. The initial slow supply of aircraft meant that daylight training was not possible, but by November at least one squadron had sufficient to do so.

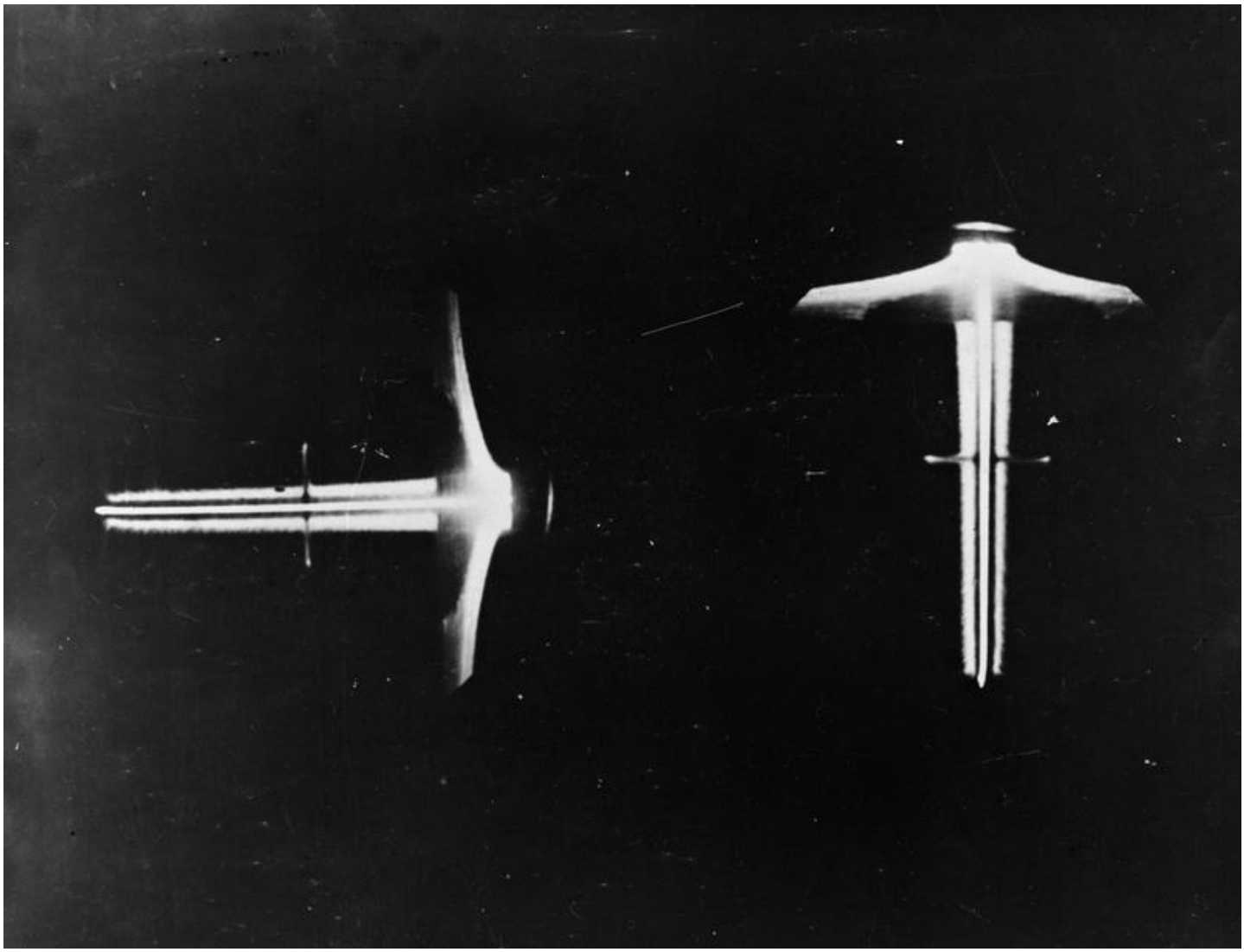
12. Up to the present it has not been possible to find enough aircraft for day and night work; but now that No.219 Squadron is well equipped, and other Squadrons are filling up, it is possible to detail a flight or section as the case may be temporarily for day work in order that intensive practice flying may be carried out so that the co-operation between pilot and operator may be improved. The "unconverted tries" which occur at night have little educative value, since nobody knows just what has happened, but I hope that training by day will reveal a technique by which this difficulty may be over-come.

21. This highlighted that the position of the target aircraft did not correlate with that on the equipment screens, a fault traced to dry-soldered and other poor connections in the AI equipment, with all squadrons being alerted to the problem.

13. The day trials which it has been possible to carry out have already given a most important clue which may result in the early solution of this major difficulty. It has been ascertained that, although the A.I. instrument is to all appearances in perfect working order and an echo is seen on the tube which appears to emanate from a target directly ahead of the fighter, the target is in fact not directly ahead but is widely displaced from the prolongation of the longitudinal axis of the fighter.

14. This is stated to be due to inexpert installation of the A.I. apparatus, resulting in "dry-soldered joints" and other imperfect connections.

22. The disappointing initial performance of AI was blamed on the long approach by the night fighter after acquisition into firing position, considered as slow and inefficient when compared to day fighter tactics, by Air Officers who had last seen combat in open cockpit biplanes.

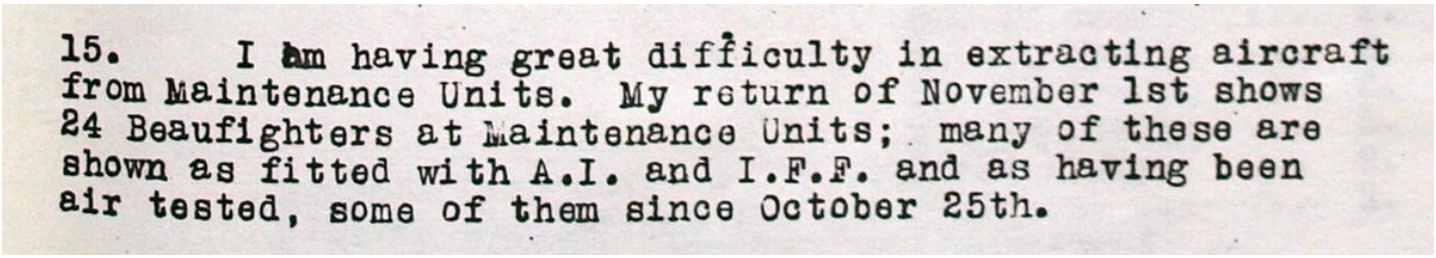


23. The results of night fighter defence up to the end of the Blitz in July 1941 illustrate that meaningful results were only possible after the teething troubles of GCI and the Beaufighter/AI Mark IV combination were overcome.

[redacted]

24. Although quantitatively the number of AI-equipped squadrons just started to increase in May 1941, while only one extra squadron had been added to the order of battle compared to September 1940, all bar one were operating Beaufighters or Havocs equipped with AI Mark IV.

25. The RAF was clearly desperate to obtain as many Beaufighters as possible for the night battle. One report complained that on 1 November 1940 there were 24 Beaufighters at Maintenance Units, many already fitted with AI and other equipment and air tested.



15. I am having great difficulty in extracting aircraft from Maintenance Units. My return of November 1st shows 24 Beaufighters at Maintenance Units; many of these are shown as fitted with A.I. and I.F.F. and as having been air tested, some of them since October 25th.

26. Ministry of Aircraft Production statistics show that 111 Beaufighters had been delivered to the RAF by the end of 1940. 47 Beaufighters had been fitted with AI by November 1940. On 14 December 1940, 85 Blenheims & 57 Beaufighters fitted with AI were with squadrons.

United Kingdom New Aircraft Deliveries by Types—(contd.)

TABLE 3—(contd.)

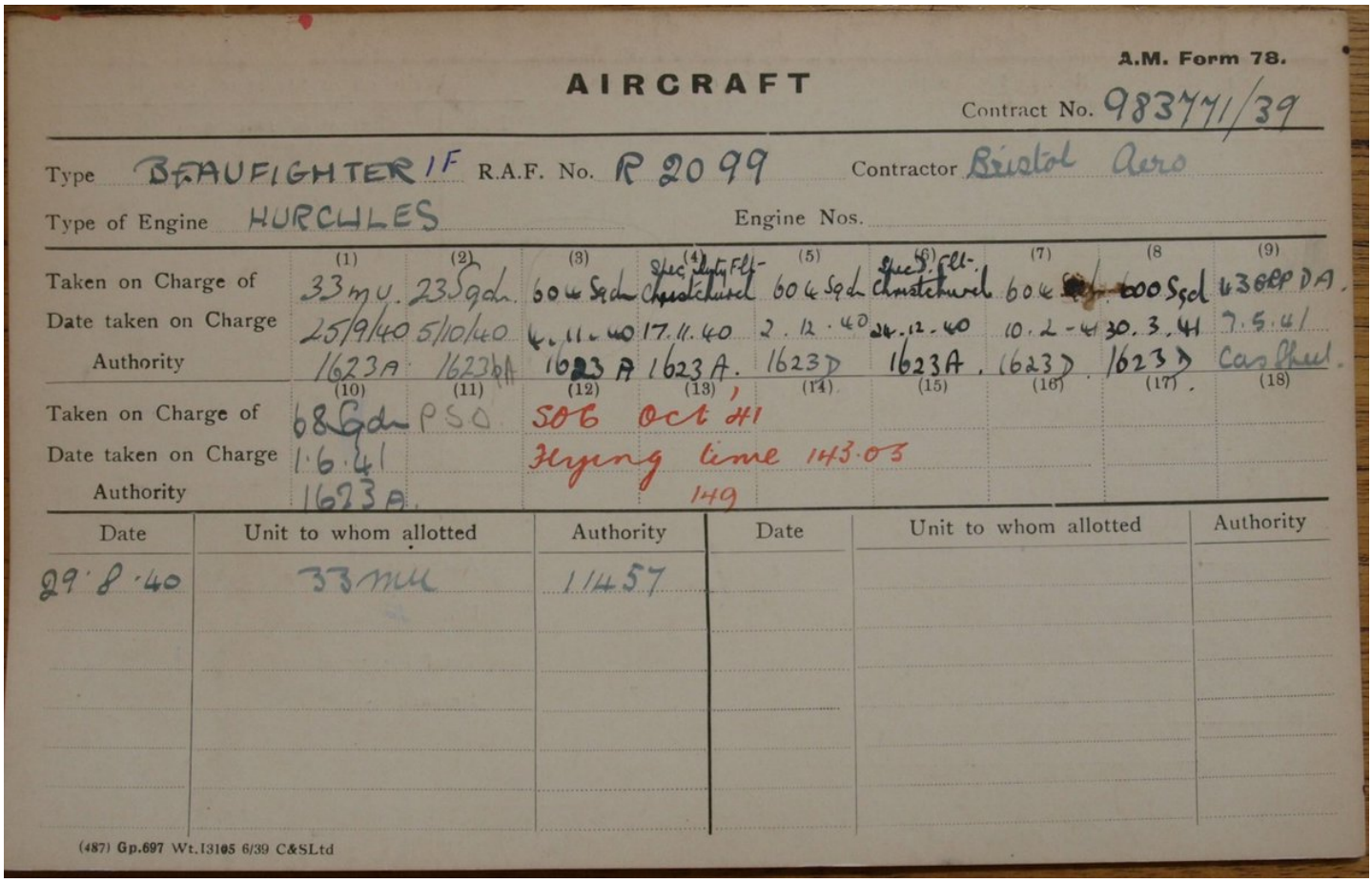
	Light Bombers and Fighters										
	Single engine							Twin engine			
	Hurri-cane	Spitfire	Defiant	Typhoon	Tempest	Spiteful	Vampire	Blen-heim	Beau-fighter	Mosquito	M
1939 1st Quarter	42	28	—	—	—	—	—	80	—	—	
2nd Quarter	42	40	—	—	—	—	—	85	—	—	
3rd Quarter	42	30	2	—	—	—	—	100	—	—	
4th Quarter	64	46	4	—	—	—	—	94	—	—	
1940 1st Quarter	107	41	7	—	—	—	—	75	—	—	
2nd Quarter	236	80	24	—	—	—	—	127	1	—	
3rd Quarter	258	160	45	—	—	—	—	154	14	—	
4th Quarter	239	135	46	—	—	—	—	150	22	—	
1941 1st Quarter	237	159	56	—	—	—	—	159	26	—	
2nd Quarter	257	190	44	—	—	—	—	149	54	—	
3rd Quarter	292	232	26	3	—	—	—	104	91	3	
4th Quarter	270	258	25	6	—	—	—	49	95	4	
1942 1st Quarter	277	314	19	15	—	—	—	50	130	15	
2nd Quarter	270	362	9	51	—	—	—	69	136	24	
3rd Quarter	249	358	—	74	—	—	—	56	123	43	
4th Quarter	226	344	—	89	—	—	—	52	138	61	
1943 1st Quarter	239	365	—	93	—	—	—	31	136	79	
2nd Quarter	236	361	—	90	—	—	—	18	134	94	
3rd Quarter	227	351	—	94	—	—	—	—	139	104	
4th Quarter	211	348	—	101	1	—	—	—	138	106	
1944 1st Quarter	147	388	—	112	16	—	—	—	124	183	
2nd Quarter	70	448	—	113	35	—	—	—	100	177	
3rd Quarter	13	404	—	90	56	—	—	—	92	193	
4th Quarter	—	399	—	73	62	—	—	—	70	193	
1945 1st Quarter	—	362	—	53	68	—	—	—	47	236	
2nd Quarter	—	264	—	28	63	1	1	—	32	198	
3rd Quarter	—	180	—	17	65	1	1	—	12	132	
4th Quarter	—	70	—	2	38	—	8	—	—	61	
Yearly totals											
1939	569	434	16	—	—	—	—	1,079	—	—	
1940	2,521	1,246	366	—	—	—	—	1,521	111	—	
1941	3,167	2,518	452	28	—	—	—	1,381	800	21	
1942	3,067	4,134	86	686	—	—	—	683	1,579	427	
1943	2,742	4,276	—	1,137	3	—	—	147	1,641	1,152	
1944	688	4,916	—	1,165	504	—	—	—	1,155	2,238	
1945	—	2,627	—	299	702	5	28	—	271	1,881	

(1) Single engine.
(2) Twin engine.

27. This implies nearly half of the aircraft delivered in 1940 had been destroyed or seriously damaged. This trend continued, as 36 Beaufighters were destroyed or badly damaged in accidents during the first three months of 1941, almost half of the

77 in squadron service.

28. This is an Aircraft Record Card, which exists for every RAF aircraft. Because I went through 500 of these, I was able to track the expansion of the night fighter force from the delivery of aircraft to & total strength of squadrons up to the end of the Blitz.



A.M. Form 78.

AIRCRAFT

Contract No. 983741/39

Type BEAUFIGHTER IF R.A.F. No. R 2099 Contractor Bristol Aero

Type of Engine HURCHLES Engine Nos.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Taken on Charge of	33 m.u.	235 Sqdn.	604 Sqdn	Spec. Duty Flt Christchurch	604 Sqdn	Spec. Flt. Christchurch	604 [illegible]	600 Sqdn	4380 PDA.
Date taken on Charge	25/9/40	5/10/40	4.11.40	17.11.40	2.12.40	24.12.40	10.2.41	30.3.41	7.5.41
Authority	1623A	1623A	1623A	1623A.	1623D	1623A.	1623D.	1623D	Cas Rpt.

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Taken on Charge of	68 Sqdn	PSO	SOC Oct '41						
Date taken on Charge	1.6.41		Flying time 143.05						
Authority	1623A.		149						

Date	Unit to whom allotted	Authority	Date	Unit to whom allotted	Authority
29.8.40	33 MU	11457			

(487) Gp.697 Wt.13105 6/39 C&SLtd

29. This table demonstrates that Beaufighter absolute numbers increased very slowly during 1940 and early in 1941, due to high losses from accidents over the winter months, and it took until June 1941 before the number of Beaufighters in Fighter Command exceeded a hundred.

30. A shortage of Hercules engines prompted the development of the Beaufighter IIF, with Merlin XX engines, which served with AI squadrons in Fighter Command until the Beaufighter VI, finally equipped with Hercules VIs, became available in 1942.

31. By May 1941 the Beaufighter had been in service long enough for Sir Henry Tizard to arrange a meeting between the Ministry of Aircraft Production, Air Ministry and Fighter Command, to discuss progress and agree improvements for the aircraft and radar system.

S E C R E T

Paper No. S.R. 16/41
Copy No. 1

REPORT OF CONFERENCE ON TECHNICAL AIDS TO NIGHT FIGHTING

Held at the Imperial College on Thursday 8th May 1941.

Present:-

Ministry of Aircraft Production -

Sir Henry Tizard		
Mr. Watson Watt	-	S.A.T.
Mr. D.R. Pye	-	D.S.R.
Mr. W.S. Farren	-	D.T.D.
Group Captain Bilney	-	D.Arm.D.
Mr. O.F. Brown	-	D.C.D.
Mr. R.S. Capon	-	D.D.R.D.Arm.
Mr. B. Lockspeiser	-	D.D.S.R.2.
Group Captain C.K.Chandler	-	D.D.C.D.2.
Mr. J.E. Serby	-	A.D./R.D.L.
Mr. I. Bowen	-	A.D.Arm.R.
Mr. B. Vaughan Williams	-	R.D.Arm.3.
Mr. J.E. Adamson	-	S.A. to Sir H. Tizard.
Wing Commander Helmore		

Air Ministry -

Air Marshal Sir Philip Joubert	-	A.C.A.S.(R).
Air Commodore Whitworth Jones	-	D.F. Ops.
Group Captain H.G. Crowe	-	D.D.A.T.
Group Captain P.C. Livingstone	-	C.M.E.
Wing Commander C.A. Lewis	-	A.C.A.S.(R).
Air Commodore R.B. Mansell	-	D.O.R.(Representing A.C.A.S.(I))

Fighter Command -

Air Marshal W.S. Douglas	-	A.O.C. in C.
Air Commodore A.H. Orlebar	-	H.Q.F.C.
Group Captain Harcourt Smith	-	H.Q.F.C.
Wing Commander D.F.W. Atcherley	-	25 Sqn.
Wing Commander H. Appleton	-	604 Sqn.
Wing Commander J.W. Homer	-	F.E.E.
Wing Commander T.G. Pike	-	219 Sqn.
Wing Commander W.P.G. Pretty	-	H.Q.F.C.
Wing Commander P.W.Townsend	-	85 Sqn.
Squadron Leader J.L.Brown	-	Sopley G.C.I.
Squadron Leader J. Cunningham	-	604 Sqn.
Squadron Leader H.C. Devitt	-	Durrington G.C.I.
Squadron Leader R. Hiscox	-	F.I.U.
Squadron Leader A. Sanders	-	264 Sqn.
Squadron Leader E.J. Smart	-	Wittering.
Flight Lieutenant A.B. Halliwell	-	11 Group.
Pilot Officer R.W.P. Stevens	-	151 Sqn.
Mr. H. Larnder	-	O.R.S.(F.C.)
Mr. J.H. Cole	-	O.R.S.(F.C.)
Mr. L.G.H. Huxley	-	O.R.S.(F.C.)

Coastal Command -

Professor P.M.S. Blackett

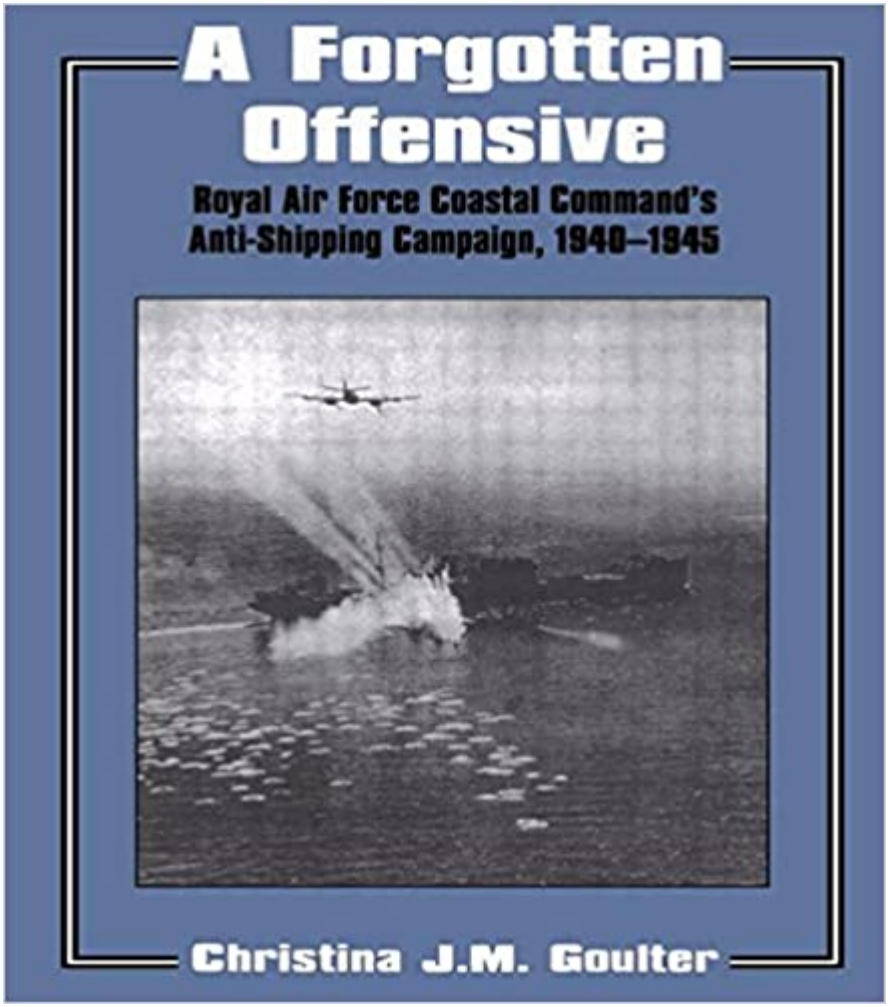
32. The gunsight was too bright on dark nights, and there had been failures of cannon ammunition when the casing collapsed. Dampness was still causing problems & large numbers of equipment valves were unsatisfactory leading to rejection.

The G.J.3 gunsight is not satisfactory for all conditions of darkness and the cover over the sight is a disadvantage for night use.

33. Sixteen Beaufighter squadrons were planned by the end of 1941 to expand the night fighter force, but by July, only eleven had formed in Fighter Command, not all fully equipped, with the number of operational aircraft limited by shortages of fully trained aircrew.

34. As the supply of aircraft increased, the use of the Beaufighter expanded into strike roles with bombs, rockets and torpedoes, both with Coastal Command and onwards into the Mediterranean and Pacific theatres.

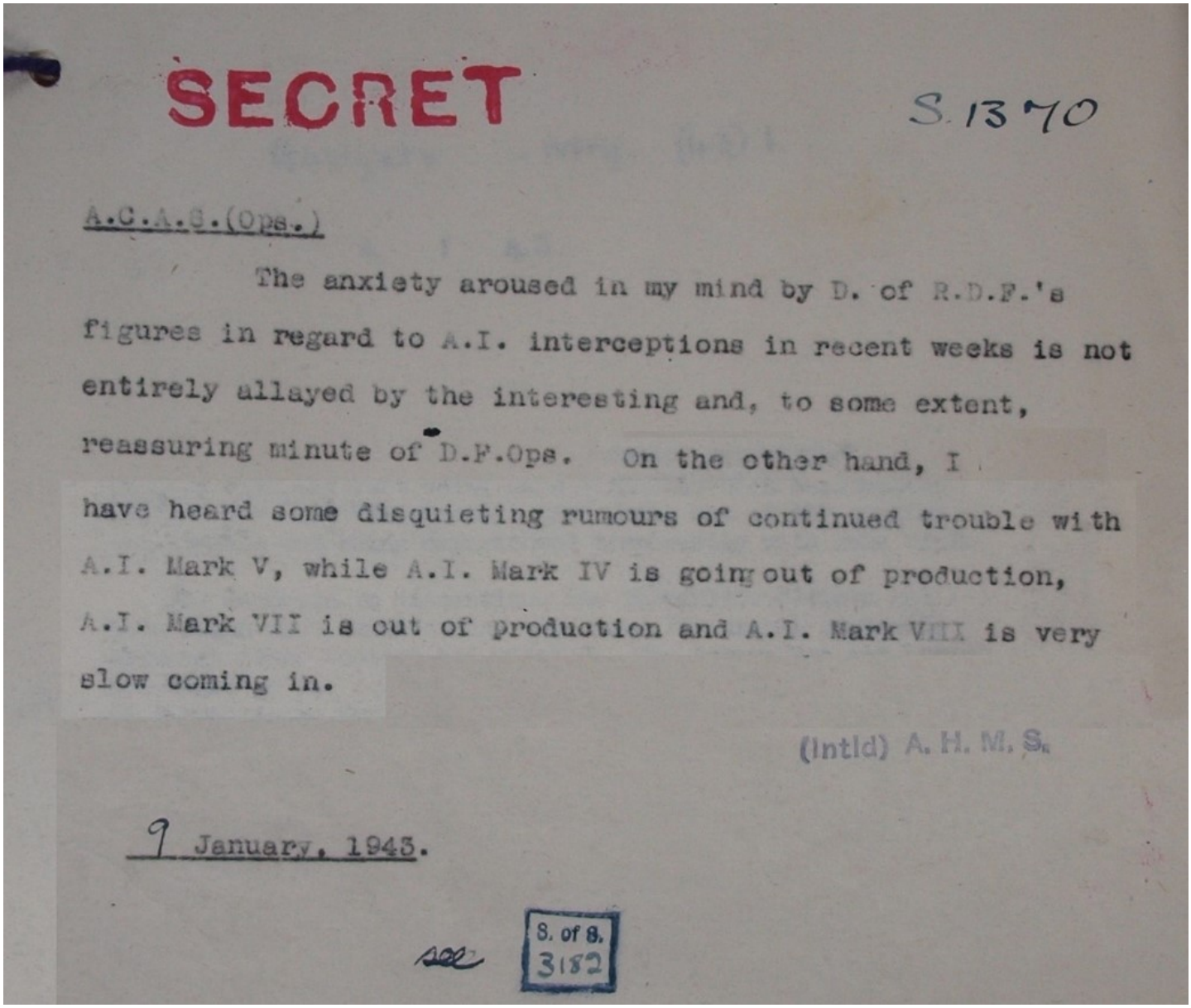
35. For Fighter Command, the contribution of the Beaufighter has been overshadowed by the de Havilland Mosquito. In 2019, at the ‘Normandy 75’ conference. I had the opportunity to discuss this with Christina Goulter, who also feels this is the case for Coastal Command operations.



36. The superior performance of the Mosquito as an AI fighter was not significant during 1942, due to the small number of squadrons available, as by October 1942 only five fighter squadrons had equipped with Mosquitoes, and not all were operational.

37. These aircraft used AI Mark V, which was the metric AI Mark IV equipped with a target indicator for the pilot, reflecting the ‘pilot-centric’ nature of the service, which distracted the pilot during the final stages of the interception.

38. This meant that contacts were lost which could have been held with AI Mark IV, and throughout 1942 there were ‘disquieting rumours of continued trouble with AI Mark V’, reports of which reached the Secretary of State for Air by the beginning of 1943.



SECRET

S.13 70

A.C.A.S.(Ops.)

The anxiety aroused in my mind by D. of R.D.F.'s figures in regard to A.I. interceptions in recent weeks is not entirely allayed by the interesting and, to some extent, reassuring minute of D.F.Ops. On the other hand, I have heard some disquieting rumours of continued trouble with A.I. Mark V, while A.I. Mark IV is going out of production, A.I. Mark VII is out of production and A.I. Mark VIII is very slow coming in.

(Intld) A. H. M. S.

9 January, 1943.

S. of S. 3182

39. The first centimetric AI radar sets, the interim AI Mark VII, was introduced in January 1942, when thirty-seven sets distributed between four Beaufighter squadrons began.

40. The first AI Mark VIII radar was introduced in January 1943, to replace the Mark VII. Initially only Beaufighter squadrons were reequipped, and was not until March that Mosquito XIIs with AI Mark VIII arrived at squadrons.

41. Re-equipment was initially slower than with Beaufighters, and it took until the end of 1943 before the number of Mosquito squadrons equipped with centimetric radar outnumbered those using Beaufighters.

42. By the start of 1942 there were only 3 Beaufighter squadrons in Coastal Command, and it was not September 1942 until it was agreed for use as a torpedo bomber. The TorBeau strike wings began operating from North Coates in 1943.

43. Subsequently, the Beaufighter Strike Wings operated successful until they began reequipping with Mosquitoes at the end of 1944. In both Fighter and Coastal Command the Beaufighter did the hard work until the Mosquito arrived & took more credit than it deserved *ENDS*