

# The end of *Forked Ghosts*

## Twin-tail-boom aircraft designs of 1939-45 – Facts and Fantasy –

by X.Toff



*For my loving wife Emelyn*

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## INTRODUCTION

This new book is the very last one about 'twin-boom projects designed in 1939-45'. The search ending does not mean that all is now complete, just : I resign. I have never belonged to the serious world of historians, even if I was glad buying History books/magazines and I appreciated most contacts I had with historians (the very nice J.Miranda, F.d'Amico, H.Léonard, T.Buttler – not P.Gaillard, violently refusing to share what engineers gave him...). My aviation passion is just an entertainment, absurdly focused on twin-boomers since the very beginning<sup>1</sup>. Used to write unusual missing books<sup>2</sup>, I considered creating the encyclopaedia gathering all 'twin-boom' aircraft. I chose not to focus classically on 'built & flown' efficient machines but on designs<sup>3</sup>. As there were thousands of twin-boom designs, I decided to select a special time-frame for a few dozens of aircraft, all being included – and hoping to be published, I selected the most famous period: World War 2 (1939-45 for French publishers). Selecting those famous years was not war-fascination at all, and I was even very sorry to focus on this period, when almost all aircraft were designed to kill (and many have been used to murder civilians). So I decided to include only projects and prototypes – that have not been used, staying on the drawing board or at an experimental step. I wrote this way 'Forked Ghosts' in 1997-98, saying not a word about weapons, about armies, and even about nationalities<sup>4</sup>. I had included 2 fiction aircraft created in the 1990s by a cartoonist (Ted Nomura) in a free imaginative scenario for 1945-46. For me, there was no reason to reject them as 'untrue': they were nicely belonging to my '1945-like' stamp-collection<sup>5</sup>.

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<sup>1</sup> *During my childhood, my brother and me got as presents 2 aircraft model kits: a very-peculiar very-beautiful Black-Widow twin-boomer and an ordinary Ilyushin; as I was weak and dominated, my older brother took the Black Widow and I was a little sad as usual, but he made so many mistakes that he threw away his unfinished kit – while I was succeeding in building my Ilyushin, overcoming my brother for the very first time in my life... From this very day, I became a twin-boom aircraft model enthusiast. Loving aviation somehow but without any classical relation to freedom (bird flying, fighting evil) nor power (high performances, heroic weapons). I wanted to become an aircraft engineer, to design twin-boomers.*

<sup>2</sup> *Growing a teenager, I almost died from a broken heart, and wanted to become a poor street-cleaner as an alternative to suicide. My father asked me, after brilliant involuntary success in Mathematic exam, to spend at least 2 years in University; I accepted and became technician – a painful position, as I see many huge mistakes in the experts' papers, and they are very angry because they are officially right no matter what is the technical or mathematical truth... Well, after hours, I had written a book, a very major heretical philosophy one ('Against Reality, Logical reasons to turn towards dreams'); but instead of making me become famous and reach again my lost girlfriend, it was completely censored, as opposite to the official rule of professional 'intellectuals': displaying deep classical Culture without facing logic...*

<sup>3</sup> *I mainly appreciated aerodynamic weird drawings, not military glory (or commercial success) featured by photographs. It was not criminal, I thought, to prefer the poorly-known dreams of engineers rather than the famous life-and-death adventures of pilots.*

<sup>4</sup> *My opinion, very far from politicians' and journalists', is that all nice human beings should be friends, without proud borders nor flags – the nationality principle rejects strangers including very nice ones to prefer some very bad fellows, and I feel differently: the crime of Hitler and Napoleon was not their wanting a united Europe, disturbing local leaders wanting badly a full authority, it was their way to dominate/kill gentle people.*

<sup>5</sup> *I was not born even in 1960, so every book referring to the 1940s requires imagination from me. Speaking of some old years can be true or not, I do not know, and I do not care. I do not even believe the present World is true, as this may be a dream of mine, so what is called 'past of this World' is even more dubious. I know that such thoughts, mixing dream and Reality, are classified as pure madness (paranoid schizophrenia or schizoid paranoia) by psychiatrists... but I have proven in my first book that they are completely wrong, as far as logic is concerned, and they are just powerful enough to reject embarrassing thoughts in asylum (exactly like the Soviets did with the disturbing citizens, their doctors and scientists assuring that sane Reason automatically drives to understand the World must be communist...)*

Anyway, I understand this is not only 'heretic', it is judged as dishonest: professional historians and journalists are used to work with a mandatory focus on true facts, 'inventing to provide a better story' (and earn more money) being an absolute crime. So let me say clearly now that my personal subject is not History at all, just some collection of shapes, no matter if they are true or not. They do not provide me a single cent/penny, and I do not pretend at all to say The Truth... Two years after printing the book, as a very costly author-published volume, it has been officially included in the nice La Plume du Temps catalogue (without author rights, just mutual help); it was classified in the History part of this catalogue; I accepted, not realising the misunderstanding – as I was just leaving hospital, and feeling always sleepy due to psychotropic over-doses. Most aviation magazines, receiving a free copy of this book, refused to say a single word about it, censored.

Then, new contacts brought additional discoveries and I understood that my 175-projects collection has been far from complete. Discovering the Internet, I found also a whole-world of fiction aircraft that could have been included as the 2 presented first – some were amazing (mainly the P-38 pushers), and that brought far more than just a few additional lines in a list; these surprising peaceful dreams about famous aircraft should have been my selected subject, but it was too late. I intended to make a Web site with drawings of all these additional twin-boomers, but my publisher required that I closed down such a free gallery, troubling his book sells. He published a 'Supplement to Forked Ghosts'. Almost all journalists and book-shops have refused this book, only one article speaking of it, to disagree about the mixing of Dream and Reality. Dreamers are officially criminals – and the bombers that slaughtered Dresden and Tokyo civilians are official heroes...<sup>6</sup> As any way to consider those years is bad according to someone, I am going to cultivate flowers, as a new hobby, leaving any aircraft subject to authorised experts. This book is just left behind, gathering the last designs in a given up collection. It is not even published, I just felt I must finish this work properly and send it to the ones that nicely enriched my collection before its closure. There will be no continuation, even by another author, probably.<sup>7</sup>

So, 'The end of Forked Ghosts' is just the last step in a difficult path, a little crazy. May some reader enjoy this overview anyway...

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<sup>6</sup> *I have been educated in a family of Historians, in a World dominated by veterans, where enjoying Aviation History books presenting shapes was classified as respectable; then, growing old, I have diverted, using my ability to invent, and found new things that pleased me just as much, even if veterans strongly disagreed. I understand the respect deserved by the ones that have faced death for us, but I think new generations should be friends without hating forever each others across the borders for the crimes of some forefathers... Most of the old soldiers are dead now, but the new Fabius-Gayssot Law requires in France to follow absolutely the History of those years as officially defined, without any doubt or dream, classified as nazi. I agree that Hitler and his following murderers had to be killed, even if Jesus Christ told us to love our enemy (this may be the best way if it makes the evil disappear into common prayer, but this does not work at all it seems, without His personal charisma). I have Jewish ascent, I am married to a Christian wife, and I understand the different opinions. In my uncomfortable dreams about those years, there is no hate nor violent intention...*

<sup>7</sup> *Every aircraft manufacturer in the World has probably taken into account the possibility of using a twin-boom layout, so following each new discovery in the archives would be endless – and not to include many thousands of items, it is necessary to strongly focus on dates, rejecting 1938 or 1946 designs, while such designs are not less interesting. Concerning fiction, ALL the normal aircraft designed in those years may be imagined in twin-fuselage double-plane versions, and late twin-derivatives may be imagined from ALL earlier aircraft... this brings back to many thousands. The subject choice has been wrong. But I needed to thank the ones that helped me along the way – I have tried here to present, as much as possible, creations of other dreamers than me, even if this is not easy: I am unable to pay a Copyright to the author of each dream, as I do not earn a single cent from my books, I just send to every one in the World that helped me a free copy, and this is already very costly; inventing by myself would have been cheaper and quicker, but I have been educated to turn outside, to prevent selfishness...*

## SERIOUS

### Experienced design bureaux

- *New items*

\* A new major addition to the catalogue is the project Boeing Pretzel **368.3** with booms up and down instead of the usual lateral layout. Some similar shapes were in *Supplement No.1*, invented, but this serious one is completing the overview. In detail, the 1943 **Boeing Project 368** used many different shapes, starting by 7 pushers with a nose air-intake (twin-boom **368.0 to 368.3**, pod-and-boom 368.4 & 368.5, canard 368.6) than turning to almost-classical, with a P-39-like central engine (368.7 to 368.10).

\* Among aircraft designed as twin-boomers to use a jet engine (central weight with a short jet pipe), there was one project keeping a nose propeller for cruise : the **Miles M.58**. This 1943 design would have used a very fuel-efficient 500hp engine, for up to 7 hours, till a high speed was needed, if ever. This could have been a very useful aircraft, at these early steps of jet engineering, when very high fuel consumption was the rule. Anyway, it was not selected, as 500hp was misunderstood as not enough for a high performance plane... while the maximum speed was actually estimated as 465mph (750 km/h). The air intakes were several: below the spinner, on the sides of the nose, on the belly.

\* A rather unknown twin-boom project from **Vickers** is dated **August 27 1941**. It was a three-seater single-engined aircraft, and it has been rejected at an early stage, the company preferring a *normal* design instead of the best performing, less likely to be accepted by officials... Well, this can be understood: the pusher propellers aft of the cockpit could have frightened the crew, in case of bailing out. The same reason led to the cancellation of the top-performance pushers XP-54/55/56 (twin-boom/canard/tailess).

\* A twin-boom glider has been designed by Max Holste : the H.20 P1 or **Holste 20-Pe1** (P or Pe meaning Performance). The prototype, not finished, has been destroyed when the factory burnt in 1944. The code MH-20 seems to apply to a different aircraft, a racer.

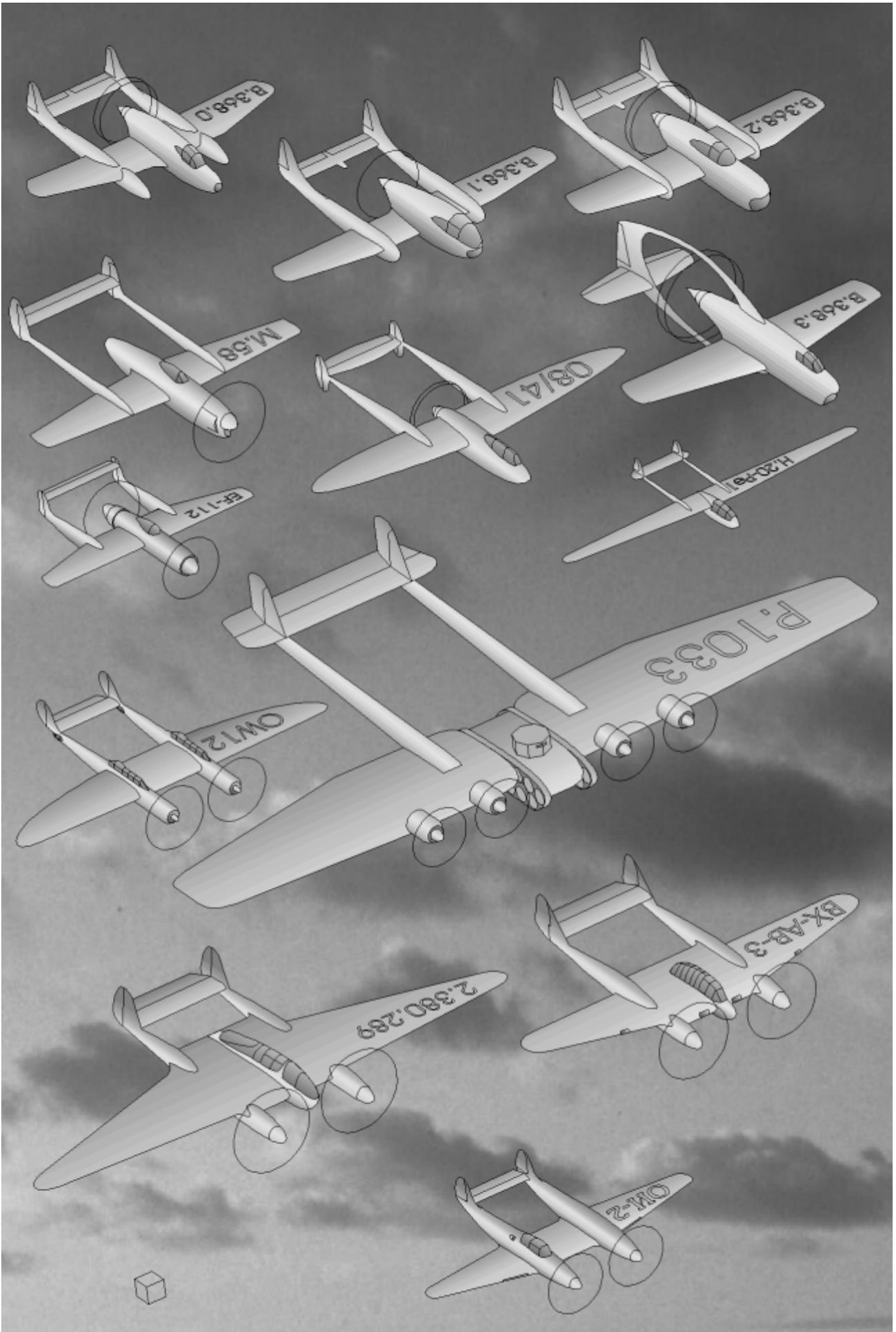
\* The **Junkers EF-112** was a push-pull project of 1942. Its booms were very low and this is not usual. One drawing shows a slightly different version, with the booms lengthened ahead of the wing. See at Dan Johnson's <http://www.luft46.com/junkers/juef112.html> .

\* The **Saunders-Roe P.1033** project of 1940 is mentioned as a *tank carrying* aircraft, and that remains the Antonov Krilya Tanka (not perfectly a twin-boomer) or the Christie M-1932 (older). The P.1033's caterpillars were not used as a landing gear – there were wheels below, that would be removed with the wings. On the An KT, the tracks were the only landing device and reaching 100mph (160km/h) for take off with them would have been a problem, but a Packet twin-boomer used a caterpillar landing gear for rough fields, and it worked in 1947.

\* In the book *The Welch airplane story* was presented the **Orin Welch OW12** twin-fuselage, last creation of this designer, in 1941. Despite the low power (2 engines of 600hp), the cruise speed would have reached the one of the B-26 Marauder, thanks here to reduced drag of the fuselages hidden aft of the engines. It seems a crew of 6 would have been aboard, with turrets in many locations, justifying also the twin-fuselage layout.

\* In the **Burnelli** family, a poorly known project is dated 1939 : the **BX-AB-3**. This one used convertible pods, at the centre of the lifting fuselage, with rear view or other features. A model tested in a NACA wind-tunnel gave wonderful aerodynamic results, but the Douglas A-20 won the order. The BX-AB-3 shape appeared again in the 1945 Burnelli **Patents** 2,372,250 and **2,380,289**, slightly different.

\* The single-seater **Byelyayev OI-2** (maybe *Odnomyestniy Istribityel 2-motorniy, OII-2*) used the central-engined fuselage of the P-39 Airacobra, doubled and adapted. The name Tvin-Aerokobra has been mentioned, years later. To compare, actual-fiction Twin-Airacobra are presented later in this book, they are very different – the OI-2 was using the principle of the P-39 central engine, not the parts of available P-39s. Estimated speed 485mph (780km/h) was very high in early 1941. The central wing housed a load bay.



\* In the *Air Enthusiast* magazine has been presented a **Vakhmistrov** twin-boom component of composite aircraft. It was linked to 2 small single-engined airplanes under its booms (Zveno principle). With a rear door, the mother ship was powered by the aircraft she carried, she was a transport glider – Transportniy Planyor, **TP (TII)**, according to Alex Panchenko (from <http://www.ussr-airspace.com>, a site about unknown aircraft projects and related scale models), and that was confirmed by Nigel Eastaway, of the Russian Aviation Research Trust.

\* Another version of the **Vakhmistrov** transport glider used booms moved closer (so the airplanes below were here connected to the wing, not to the booms anymore). The tail had external tailplanes, outward from the closer fins. Then, with engines and a related name (Moto Planyor, **MP - MII**), a bigger version of it was considered, still as a mother-plane.

\* In *Forked Ghosts* was presented one project with floats retracting into booms, justifying the twin-boom layout, but only in the appendix (the Seversky/Republic Super-Clipper of 1937 – the Latécoère 673 of 1938 would have been similar), but now can be presented a design with such a feature dated 1944. This **De Schelde Jae 4301** float-plane flying-wing was intended to transport 200 passengers from Amsterdam to Jakarta.

\* The smaller **Jae 4302**, with just a lifting fuselage and no more passengers in the external wings, came after the 4301. A turboprop-engined version was soon cancelled, but the main design was not built either.

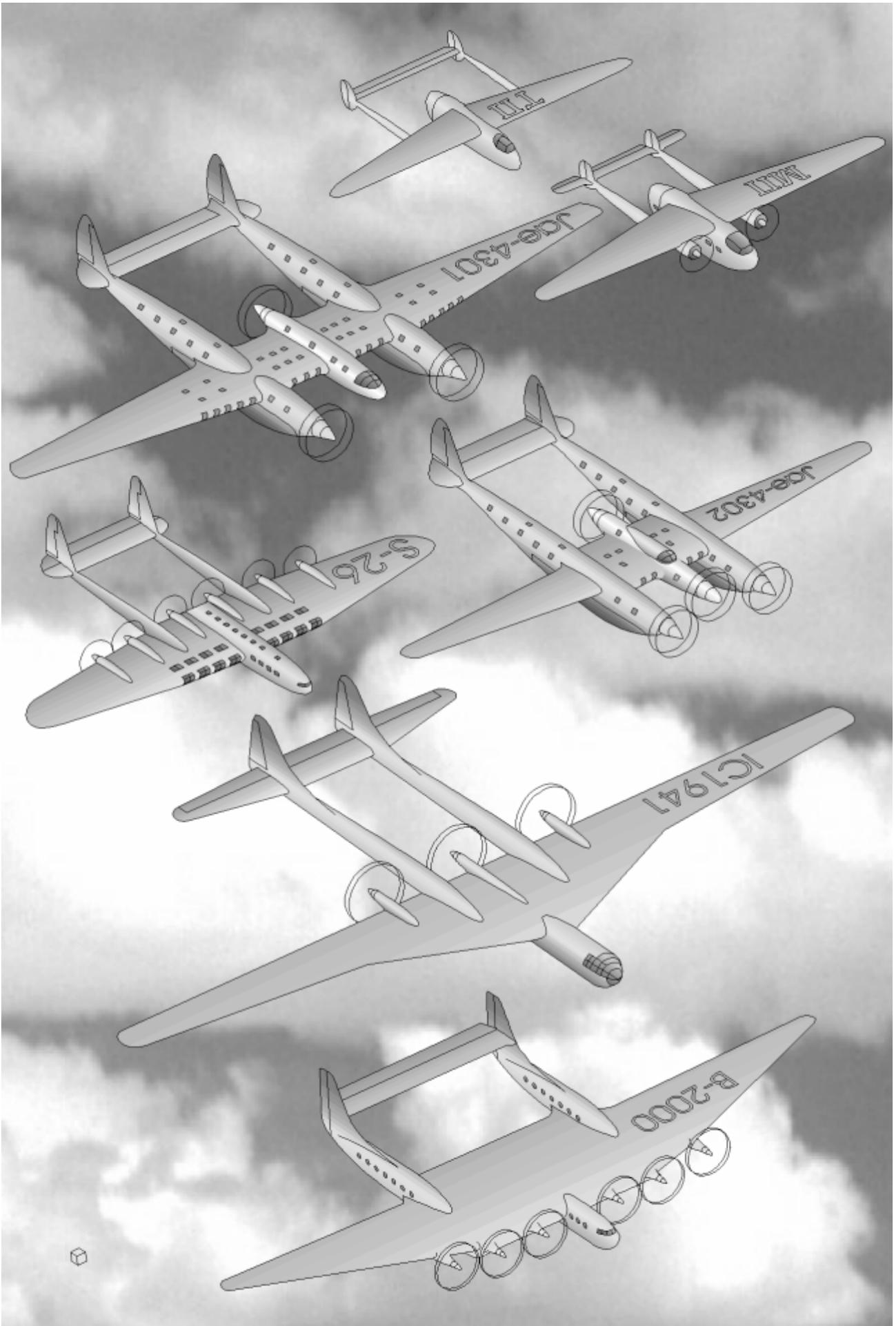
\* Previously, there has been another big De Schelde twin-boomer, a land-plane: the **S.26**, or Ontwerp 75 (design 75), with 6 pusher propellers. Among the 50 passengers, some would have been located in the wing, enjoying a wonderful view ahead. This family of De Schelde airliner designs is far less famous than the smaller and older twin-boomers S.20/21, actually built. The S.19/22/24/25 were also twin-boom projects, before 1939.

\* Another huge twin-boomer with very-long-range was the **Boeing** answer to April **1941** military **Inter-Continental** Request-for-Proposals, to cross the Atlantic Ocean back and forth without stop to refuel (usual transatlantic planes did stop to deposit passengers, while here there was just loads to drop and maybe no friendly airports anymore). The wingspan would have reached 270 ft (82 m), far above the dimension of the selected B-36. Such span is even above the one of the giant Brabazon and Princess of the late 1940s (as well as the modern giants Boeing 747, C-5 Galaxy, Antonov 124, Airbus A-380)... the Bréguet 1000t project was even bigger, but this Boeing was a more serious proposal, intended to be built immediately. Twin-tail-booms may have been selected to hold the huge tailplane required for balance.

#### • *New versions*

\* Before the well-known Canadian Car & Foundry B-2000B was the poorly-known **Burnelli B-2000**: an airliner with 6 double-propellers, different tails and having windows for passengers. It was very big too (61m = 200ft span). This design seemed to have remained in the Burnelli catalogue, so the B-2000B code could have been explained as probably meaning Burnelli-2000 Bomber, rather than CanCar Bomber-2000-II (B) coming after a 2000-I (A). Vincent Burnelli was mostly interested in designing airliners, because his lifting fuselage provided big improvement for passenger aircraft: as most of the weight is devoted to the cabin, this part can be very solid, able to resist a crash. Though, the same layout could be used for military aircraft, the advantage there being the ease to dispatch internal loads, laterally and not only back and forth (with related unbalance).

The Burnelli B-2000B had been recorded as a CanCar proposal officially, but such contract has been rather rare, it seems. The Bowlus MC-1 and related XCG-16A have not been designed by Vincent Burnelli, but as they were using Burnelli ideas, rights were paid to him preventing a trial. I do not know for Dyle-Bacalan/Bordelaise, Percival and Fokker lifting-fuselages. Concerning the Patent principle, I have no clear opinion: probably Mr Burnelli did not give anything to reward the Wright Brothers, Otto Lilienthal, Leonardo Da Vinci, so... Good things should be shared, and *copying without paying* seems a common rule, sometimes punished. It is the same for the 3-view drawings of aircraft, copied discreetly then copyrighted wickedly, and I have run away from all that, creating oblique views with mathematics from my very own brain (see Appendice page 54) – well, trigonometric tools have been taught by teachers, and Corel Draw software helped a lot...



- \* In *Forked Ghosts* were presented the **Piper Skycoupe** unknown versions PB and PA-7, but I had drawn as a basis the built prototype **PA** (or PWA-1) that was not uninteresting as well.
- \* The **Moskalyov SAM-23 LT** (*Lyetayushshey Tanketki-shturmovik*, CAM-23JIT) is new and additional: *Forked Ghosts* included several layouts published for the SAM-23 twin-boom glider, but a completely different aircraft (described in the *RART Bulletin* No.150) has been designed previously under the same code, before cancellation. It was a tiny single-seater using a 150hp engine.
- \* A poorly known **Lockheed** Lightning unbuilt project has been discovered: the **P-38 75mm** of 1943, using a bigger central pod and a cockpit moved ahead of the wing. A heavy device was installed at the former place of the pilot - to throw 75mm (3") things, probably flowers...
- \* I knew the **Lockheed Swordfish** derivative of the P-38 Lightning, modified as a 4-seater prototype after 1945, too late for this collection, but new data mentioned it was first a lengthened conversion of 1943 for the test of wing airfoils with an engineer aft of the pilot.
- \* The Daimler-Benz-engined Fokker D-XXIII was not the only version of this push-pull that has been designed after 1938: another updated design has been studied by **Mitsubishi**, as Army type 0 (meaning 1940). Receiving the American code **Harry**, it used powerful radial engines, air-cooled – with a belly scoop for the rear one. In 1938, the Fokker Ontwerp 157, big derivative of the 155 which became the D-XXIII, also used radial engines, but it had not such an air-intake below.
- \* I thought the **SAAB** J.21 preliminary design looked like the prototype, but a drawing has been recently published, showing different lines, dated **March 21<sup>st</sup> 1941** : different wings (W-shape), fins, canopy.
- \* Completing the gallery of **Messerschmitt Bf/Me 109Z**, another interesting variant had a glazed central pod, with perfect view ahead and behind (axially). This big one may have been a 6-seater, while the standard 109Z was a single-seater. Though, Justo Miranda (<http://www.luft46.com/rd/rdreams.html>) explained me that such a drawing was doomed, without lateral visibility from the central pod. As the source (*Die Deutsche Luftfahrt* Band 17) is serious, it was probably an imperfect rejected design.
- \* I must also present a different **Renard R-42**. Justo Miranda explained how to read the discrepant sources, the initial project being presented here while my old drawing concerned a longer derivative without ejector seats.

#### • *New illustrations*

- \* The **Lavotshkin La-VRD** (Л1а ВРД) jet had been mentioned thanks to the Web site *Russian Aviation Museum* (<http://www.internetelite.ru/aircrafts>). But the creator of this site, Alexandre Savine, answered very nicely my data requirement, and lead me to the Russian source <http://engine.avias.com/issues/03/page44.html> with a picture of this unknown project. It seems that S.A. Lavotshkin just signed his name on it, the design being proposed by V.R. Yefryemov (or engineers even in a lower position...). The top speed was calculated as 890km/h (550 mph) and this was very high in 1944.
- \* The **Westland E5/42** (J.15) has been presented, in *Air-Enthusiast* magazine, by Tony Buttler, thanks to Fred Ballam, it is no more a mystery. In Tony Buttler's book *British Secret Projects 1935-1950* is the whole story. Forefathers of this design: one piston-engined for the naval **N7/43** requirement, and a **Ground Attack** design of **February 1942** with a low tail below the spinner.

#### • *New dates*

- \* I had classified the **Heston A.2/45** Air Observation Post as *maybe 1946*. Tony Buttler informed me that this 12th July 1945 requirement has led to a contract to Heston for this **JC.6** project before the end of 1945, and this success could not have happened without plans already drawn, explaining principles of the pusher (twin-boom) layout and advantages of the free nose visibility. Its float version has been designed in 1946 (by Saunders-Roe), but the main project was earlier.
- \* The **Lockheed L-153-11** can also be classified as late 1945, not 1946. And there is a need to add the **L-153-8** version. Together, these twin-jets make a nice link between the family of twin-fuselage aircraft and twin-boomers with a central pod.



\* In *Forked Ghosts* was presented the **Byeryev B-10 (Б-10)** through its derivative Bolkhovitinov I, because I thought the B-10 was too old, misunderstanding. Herbert Leonard, author of the great book *Les chasseurs Polikarpov*, explained: long before the I and the B-10, in 1935, was designed the Polikarpov TsKB-21 (SI) with such coupled engines driving pusher-propellers, and lateral booms to hold the tail. This promising project was cancelled. Then, in 1939, it was updated as Byeryev B-10 and ordered, then cancelled in 1941. Shown here is the version **B-10M (RS)**, high-performance seaplane.

\* I had mentioned the **Junkers EF-50** among 1935-38 projects, referring to the EF-61 of 1937, but the Junkers-expert Horst Zoeller (of <http://www.junkers.de.vu>) explained that the EF numbering was not chronological (the EF-55 project is dated 1944), and he judged that the EF-50 was probably a 1941-43 study in the RLM VTOL program, a wind-channel model with large diameter blades as for the propellers/rotors of the Focke-Achgelis Fa 269.

- *Correcting provisional drawings*

\* I knew the **North American NA-116** only as a 4-engined twin-boomer. Fortunately, the Boeing Historical Archives have released pictures of this project. This aircraft was designed just before the XP-82 (NA-120). There were load bays in the booms and in the central pod, and maybe such a feature explained the choice of a twin-boom layout here. There was also a rear view aft of the central pod and aft of the booms. The shape is so different from my initial drawing that I feel ashamed...

\* In a *Flight* magazine of 1945 was shown a better view and explanation about the **Capra/Matra R75**: this project would have featured 2 engines (one in front of each boom) driving, through shafts and gears, a single propeller aft of the central pod. This layout is opposite to the NIAI OCh's one, featuring a central engine and lateral propellers ahead of the booms.

\* My drawing for the **Byelyayev EOI** (Экспериментальный Одноместный Истребитель, ЭОИ) was also wrong. The model with a glazed nose (in *Forked Ghosts*) was the PBI derivative. The EOI had the same general layout but was very different.

\* Other mistake : the provisional drawing for the **Capra R90** was too much closed to the R80 basis. The real design, published recently in *Le Fana de l'Aviation* used different fins and canopies.

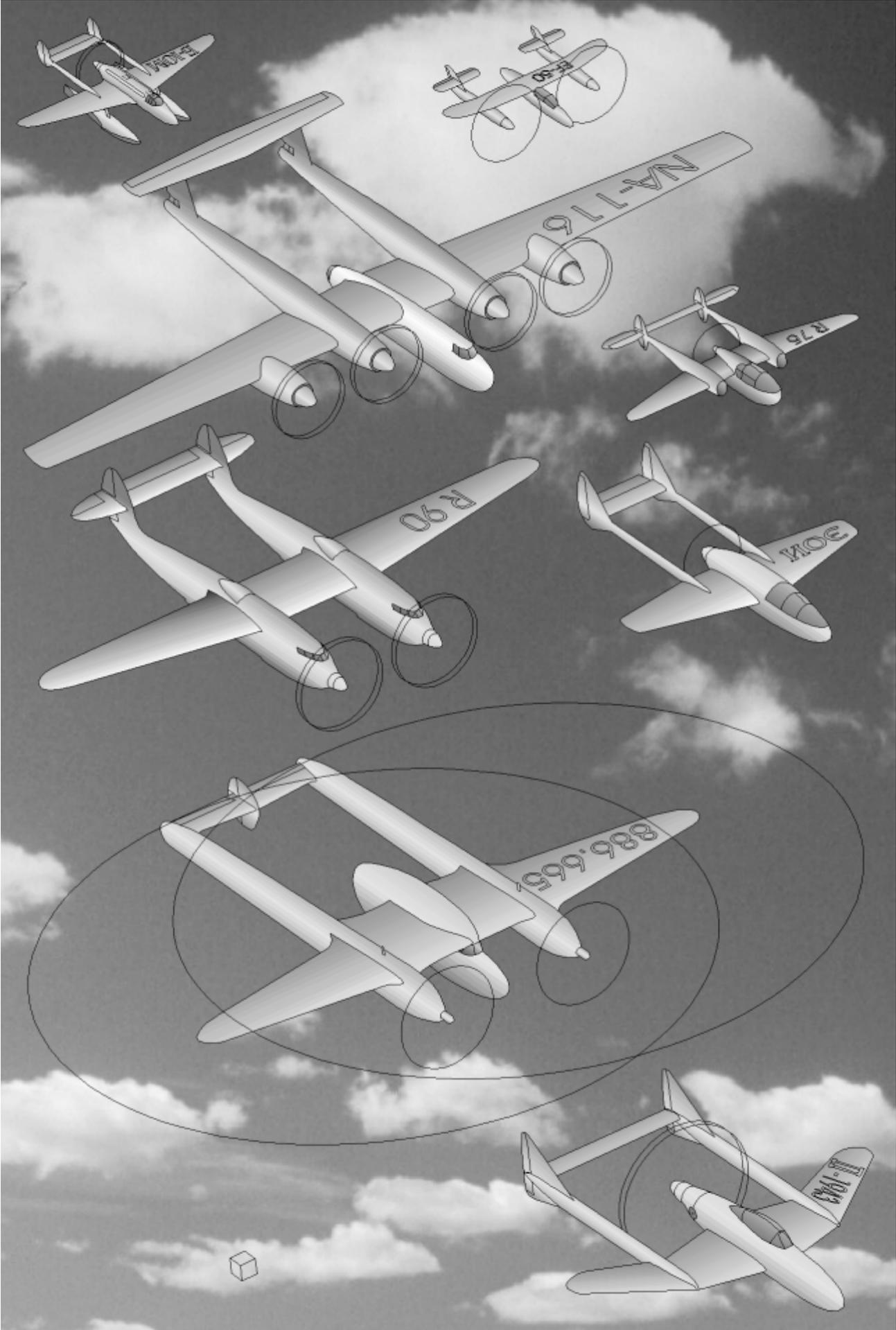
\* Corrections without drawing: the XC-65 should have been called Skycar II (the Stout Skycar of 1931 was not a twin-boomer); the Flying Whale was a Martin design; the Nord 1480, that I presented seriously with a 1943 date (a conclusion from the earlier N.1400 and later N.1500), was in fact a fiction drawing, in the 1<sup>st</sup> April 1968 issue of *Aviation-Magazine* (fools' day joke); the D+W/Pug D-3805T was a joke too, a fake made with talent; the Fairchild XC-82 Packet maybe did not come from the Fairchild F-78 project but from a design of the Kaiser company, this one being bought by Fairchild while the XC-82 prototype was being built, according to a text on the Web; the SSSR-123 glider, revealed in 1943, was a Gribovsky G-11, long before 1939.

#### Other models to be built and used

\* Correction without drawing : the Triumphant Wind project, coming from an unknown design bureau, was named Shofuh (thanks to Isao Ishiduka for translating back).

\* A patent of 1942, Pierre **Boudier's Brevet 886.665**, features a completely new reason to be a twin-boomer: on a VTOL, single-blade rotors stop after taking off then take place in the long fairing provided by booms. Normal propellers then provide horizontal speed, and maybe they were rotating from the beginning, making the transition more easy.

\* The **Pyelyenbyerg (Пеленберг)** design of **1943** was another VTOL attempt leading to a twin-boom layout: the propeller can rotate from horizontal axis (pushing ahead) to vertical axis (pushing upward). Because of too much weight and not enough power, this made just a STOL (or STO-VL) but the same principle was used on several true VTOLs later. The Pyelyenbyerg design was also special for its all-moving stabiliser and deflecting outer-wing panels (back and forth), to improve balance. Using contra-rotating propellers avoided the need for some anti-torque tail rotor. Konstantin Pyelyenbyerg had been a Mikoyan employee, but his drawing did not feature this famous signature, and it may have been personal work, not fully approved by the design bureau.



\* Engineer Leo **Rossmailer**, though not famous, designed a compound helicopter (**Flugschrauber**) for the secret files of an aviation ministry. The booms provided a square basis for the 4 lateral rotors. Another very special justification for the twin-boom layout.

\* The **Roteron X100** building started in 1945. It was a single-seat helicopter, powered by only 25hp. This was not enough to take off, and the prototype never flew... The use of 2 contra-rotating rotors avoided the use of a tail rotor, and holding the rear fin with 2 small booms was a compromise for low weight and high solidity.

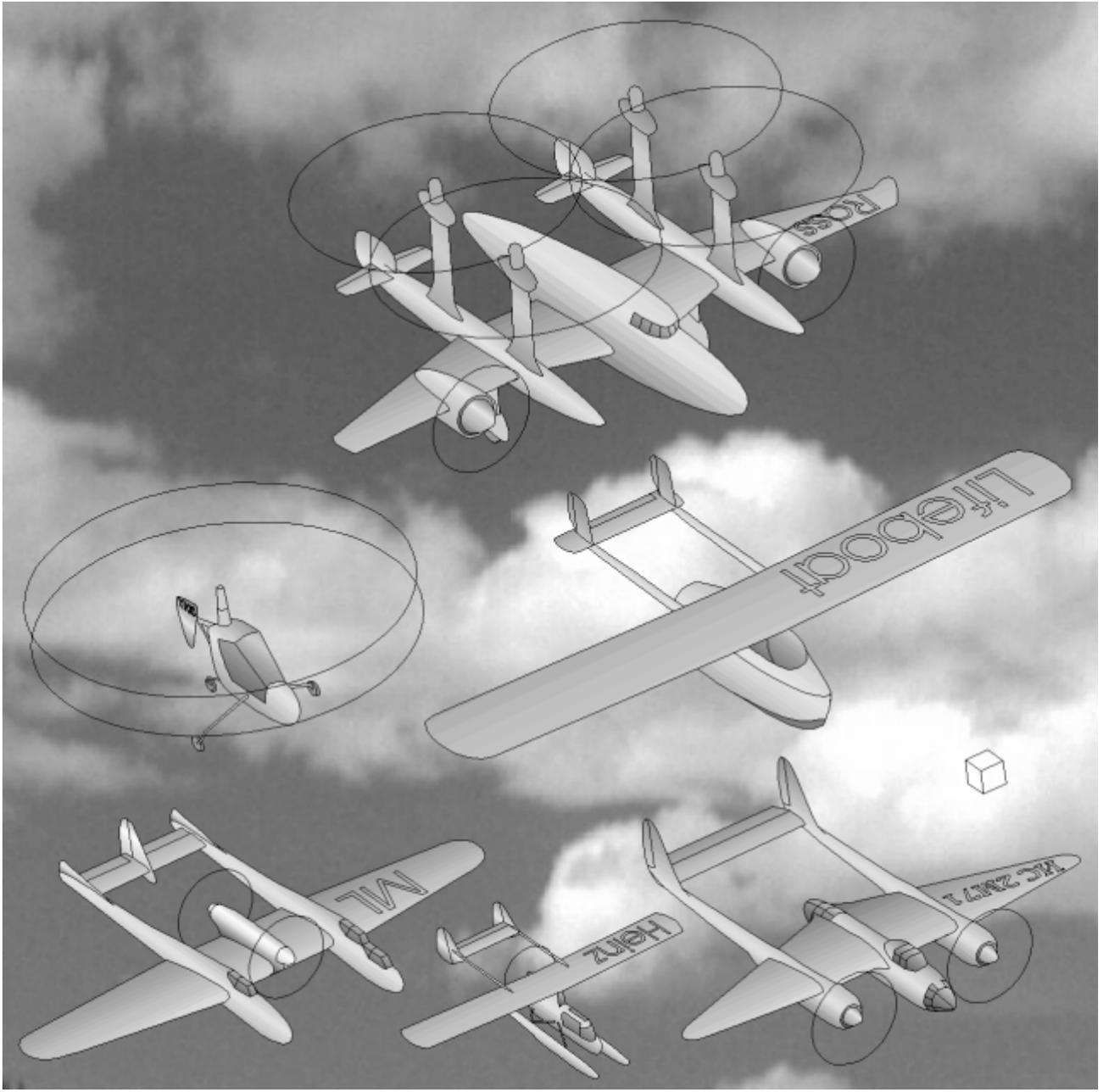
\* Another reason to use a twin-boom layout is featured on a glider-borne **lifeboat** design for the **US Coast Guards**. In *Forked Ghosts*, I mentioned flying boats with a single-propeller above the water (and not on a dragging pylon), so chosen as a pusher, thus with lateral booms to carry the tail, but even without a pusher propeller, it can be wise to select twin booms on a flying boat : as the hull shape is adjusted for optimum hydrodynamics, it is difficult to turn this part into a rear device carrying the tail far above water. So, a short hull may be devoted to the best water contact and taking off, while a high boom (aft of the high wing) is separately supporting the tail (e.g. Dornier Rs.III) – and twin booms provide more solidity there. That logic gave birth to many twin-boom flying boats: tractor like the old Bv 138 or glider like the recent Takatori SH.8 Flider. The USCG model has been designed in 1945 with the Stephens Institute of Technology and cancelled in 1947, even if it may have been a very useful device. This invention came from Pemberton-Billing decades before: to rescue shipwrecked persons, the flying Coast Guards usually dropped a rubber dinghy, falling down in the sea then floating to provide safety, but it was better to send a powered little ship with an engine, driving a water-propeller and fed from big gasoline tanks. As this was heavy and fragile, it was dangerous to let it fall down vertically, so a gliding way was selected, with wings. To touch water without problem, even if there were waves and swimming persons, a pilot was required. Once down on the water, the wings, booms and tailplane would have been jettisoned, and the ship would have welcomed 5 or 10 shipwrecked sailors, then brought them to the nearest port. Before being released and gliding to the sea, this glider would have been towed by a seaplane or flying boat.

\* My wrong NA-116 drawing had been used to introduce a twin-boomer with a push-pull engine pod and all the crew located outside, in fuselage booms – like on the Sikorsky S.19 of 1916. Such a shape has appeared again in a 1938 fiction design (*Der Deutsche Sportflieger* magazine) called *The luxurious Yacht of the Dollar-millionaire*. But during the 1939-45 period, another plane had featured such a layout: the **ML Night Fighter** of 1941. ML was meaning Marcel Lobelle, designer, or maybe Malcolm Ltd, employer. It was also known as ML F.18/40. The advantage was having no asymmetry if one engine fails (like on a Do 335) together with perfect view forward and safe bailing out (like on a Mosquito).

\* The **Heinz monoplane**, just mentioned before, can also be drawn, thanks to a 1961 *AAHS Journal* provided by Icarus Books (<http://www.icarusbooks.com/>). This seaplane was built by the Heinz Food Processing firm circa 1939, and flew, though not well.

\* The **Kurbala IS 2M-71** project (*Istribityel Soprovozdnyiy* with two M-71 engines, ИС 2М-71) and similar PB 2М-71 (*Pikiruyushchiy Bombardirovshchik*, ИБ 2М-71), both 1941 designs, have been also revealed recently. They were long-range 3-seaters with excellent field of view and high performances. L.P. Kurbala was a local chief designer with experience in improving Yakovlev aircraft, but his name remained unknown.

\* Poorly known, and wrongly classified by me, was the **James-Martin Twin-Hull Ocean Plane**. Designed *long before 1942* according to my source, I thought it should be classified as 1935-38, but this Oceancruiser was proposed in 1939, according to an old *Airpower* magazine provided by Icarus Books. It would have used Wing-in-Ground effect, with an air-cushion between hulls, and a very special Variable-Geometry : variable dihedral of external wings... James Martin got several patents but never became an official manufacturer.



## Pilot-less useful aircraft

The World of pilot-less aircraft was introduced by the Aeronca GB/GT in *Forked Ghosts*, not to be neglected maybe, just as the famous V-1 cruise-missile.

\* The **International Model Aircraft (IMA) Swallow** was tested in 1943. The power was given by 4 rocket jets in the central pod. The purpose of this aircraft was laying smoke curtains to protect ships against lethal attacks (officially, and there is no reason to imagine a land version to spray chemical poison...). Many aircraft, later, have been designed as twin-boomers for a similar role: spreading agricultural clouds of chemical drops, from a heavy tank at the centre of gravity and without moistening a rear fuselage carrying the tail. The Swallow prototype had elliptical fins and 2 booms while the developed version used square fins and additional beams to support the main booms (leading to a *several booms* status, somehow).

\* What I called *Vakhmistrov 1944 twin-boom glide-bomb*, has been presented in *Air Enthusiast*. It was the **Vakhmistrov LB** (Lyetayushaya Bomba, ЛБ). It was not flying by itself, but was carried under a small airplane (Mistel principle); it was then released to fall down like the GB/GT.

## LIMIT

### Unconfirmed drawings

\* My quest for a true 1945 twin-jet Vampire has failed: the DH.110 Vixen came from a 1946 requirement while the DH.100 pod was too small for 2 jets, explained Tony Buttler. But an early two-seater Vampire (**DH.100B?**) has been a true De Havilland project in late 1944, according to David Watkins, via Tony Buttler. This trainer was cancelled without fame, but probably the first try was not the side-by-side layout (chosen for the DH.113 of 1949), requiring uneasy adaptation to a wider central pod – tandem-seats in a lengthened E6/41 pod must have been considered.

\* Herbert Leonard's book *Les chasseurs Polikarpov* revealed a **Polikarpov** late **1943** preliminary design with fins at wing tips. My drawing is based on the hypothesis that the Polikarpov team used the same SI shape as the B-10 (so this Polikarpov would look like a B-10).

\* The **SECAN SUC 10 Courlis** has probably been considered with a retractable landing gear to improve speed and range (**SUC-10'?**) before turning to the final design of late 1945. This allows me to present a Courlis even if I keep on not including mass-produced models.

\* As the **SAAB J.21** prototype has been rather different from the preliminary drawing, I am not sure that my first drawing for the radial-engine version Linköping **L.13** was right. The engine change may have happened before the other transformations, as shown here.

\* An Historian has mentioned that the **Messerschmitt Me 409** project would have replaced the initial Me 209 fuselages by Me 155B ones. Justo Miranda told me that this twin-155 should have been coded **Me 255**. I do not know what Me 155B fuselages would have looked like, as several very-different profiles and dimensions have been published. And so I propose 2 possible shapes for this double Me 155 : one of them can be true but at least one is wrong...

\* In the history of Messerschmitt designs ~09, the new-209 (V5/A/B/H) is usually presented as a program posterior to the 309 cancellation, so the classical 409 (double new-209) probably came after the 609 (double 309). Thus, having used the codes Me 509 and 609 for the 309 derivatives means a former Me 409 was existing, before the 209 V5 (and official 409) came. I imagine a double old-209 (V4). I call it here **Me 409/1**, but Justo Miranda told me that the length must be increased by at least 1.4m (4.7ft) for balance, like on the Twin-Mustang. So : **Me 409/2**. The 209 was a racer, and twice the power with less than double weight and drag would have been even faster – a good enough reason maybe.

\* The **Martin-Baker** plane we called 'pusher' in *Supplement No.1* has been described as a '**push-pull**' by Tony Buttler, while the source profile presented only pusher propellers... The canopy lines were also very difficult to interpret without view from above.

\* An article mentioned that Frank Whittle, inventor of the jet engine, had been interested by the mock-up of the Gloster F18/37 twin-boomer designed in 1938, saying this layout was most suited for a jet engine. This **Gloster/Whittle** dream (1940?) led to special designs like the Vampire.