

• Final touch :

It is clear that any normal aircraft of these years can be twinned. When a what-if modeller asked "what B-17 version would you create?", I answered immediately "a Twin-B-17 would be welcome, please let someone describe it", but nobody did answer, and I did not invent it by myself. Creating a slanting view of a twin-plane from a single-plane 3-view drawing requires about 4 hours of work from me: 3 to draw the slanting view of the normal plane than one hour for twinning, finishing, colouring. And I hesitated to spend all that time without a designer name and explanations to justify it. And I do not find the B-17 pretty or weird enough, so I gave up. Though I have included in this book many inventions of mine, but they are different: they are based on previous slanting views (P-82, He 111Z, Twin-Fortress, etc) and required less than one hour of work each, thanks to the nice Corel Draw software. I could present now a full gallery of quick drawings done this way, using what have been done previously – it would be possible to include 300 of them, but I will only present the most pleasant, the more interesting or gorgeous, according to me...

* The usual cargo twin-boomers use a central pod and a rear door, while the *Me 323Z in Supplement No.1* used front doors. Though the twin-boom layout allows to have both : doors front and aft, as featured on the last Argosies. I have transformed this way a Me 323 into the **Me 323T**. Very easy to load/unload quickly.

* A cargo flying boat like the Hughes-Kaiser HK-1 Liberty could be similar (**HK-1B**), for rear loading from a wharf, facing the sea to take off immediately... and front unloading on an unprepared beach.

* As seen on Igor Shestakov's Web site <http://www.geocities.com/asymmetrics>, the Caproni Ca.380 Corsaro has been proposed as an asymmetric plane (Ca.381?) with the port fuselage being abbreviated just aft of the engine, alas not being a twin-boomer anymore. Though, it is easy and funny to turn this one into another twin-boomer, the fictive 3-engined **Ca.383**. I do not know why a 3-engined aircraft would be designed this way, as there is no clear advantage of this asymmetry. For fun, maybe.

* We can invent a similar 4-engined **Ca.384**, and this asymmetric one would have been rejected automatically: the booms should be internal, close to one another to hold a solid tailplane (Ca.380/4m: a normal Corsaro with additional engines at mid span of the external wings). To decrease the drag, another 4-engined layout would have been possible, push-pull: **Ca.382**.

* It is possible to turn twin-fuselage double planes into simple ones with twin-booms, like I did for the P-82 becoming XP-51D-38, inspired by the Savoia SM.92 turned back into SM.91. Here, I will only do that for a Twin-Spitfire becoming 3-seater (**Spitfire Mk 33**). With a perfect view forward and rearward, this twin-engined Spitfire would have very good reasons to be designed as a twin-boomer.

* Lateral pairing of different aircraft (like P-51 and half-P-82, Yak-3 and 15, etc.) is another way. That brought the 3-seater 3-engined Messerschmitt **Me 362** and **Spitfire Mk 145** (14+5). I have presented them raw, without improved balance.

* The Messerschmitt **Me 809** mixing 309 and 509 would have been more original, with engine location very different on port and starboard, like on the mix of P-51 and FTB.

* In the same family ~09, the Me 509Z could have been improved with a free nose for a radar, as the central engine can drive a pusher propeller as easily as a tractive one, and there is no fear of a pusher propeller on the free fuselage where no pilot will ever have to bail out – I have called this one **Me 1009**.

* As the figures 709 and 909 are missing, I add the **Me 709** as a 809 alternative (with a 209 instead of the 309 component), and the **Me 909** as a Me 509 nose inside a Me 409... So, the family would be this : 109-209-309-509 basis, then twin-planes 109Z (109+109), 409 (209+209), 609 (309+309), 709 (209+509), 809 (309+509), 909 (509+409), 1009 (509+509). And this could go on with 1109 (replacing in the 909 the 409 by a 609), 1209 (4-fuselage twin-609), etc...

* Other endless possibility : every pod and booms airplane can be turned into a twin-fuselage, as I did for the P-38 and DH.100. To illustrate that again, I present the **XP-6161E Double Widow**.

* I would like to finish with some smile, going far away from History: I have turned the big-nose efficient Twin-Zero into fragile or slow beauties (**A8M1 Kai**, **A8M2**)...

APPENDICES UPDATE

A LITTLE OUT OF THE TIME WINDOW :

- I must add several twin-boomers designed between 1935 and 1938, not listed previously: Comper-Scamp Interavia, (Glenn) Martin Twin-hull Flying-Dreadnought (Twin-Mars), Fokker Ontwerp 129/135/147/152/155/156/157 (129 à G.1, 152 à T.6, 155 à D.23), De Schelde S.19/22/24/25, Coanda twin-boom jet, WWS-1 Salamandra, Douglas Lindbergh Proposal, Polikarpov TsKB-21/SI, Hamburger P.19, Benzinmotor Model, Rocket plane model, Sheresshaw Gas model, Canadian indoor model

Among fiction twin-boomers in the 1937 universe of Crimson Skies, I have found many more at <http://members.fortunecity.com/phreke/cs/minisgallery.htm> : F-3 Aguila, AZ-2 GroundHog, SR-2 Seer, YV-1 Stalwart (+ many aircraft that are *almost-twin-boomers* for me).

- In the list of late twin-boomers probably dated 1946, I must add : Bréguet 950 (pusher flying boat), Platt/LePage transport helicopter (twin-engined) & Skycrane Helicopter (twin-fuselage), an atomic aircraft presented in *Air Trails* magazine, Dreamer model, Skyryder model, Airmaster Air-car model. The Eldred Floatplane should have been coded ED-2.

A LITTLE OUT OF THE TWIN-BOOM CLASS :

- I have presented the Twin-boom Auxiliary Wing, well known device for the Miles Magister, and adapted it to the tailless XP-56, to make less obviously a triplex-boom global shape. In fact, that was not completely dreamy, as I have discovered that the Auxiliary Wing has been considered for many different aircraft, including the Spitfire and Blenheim. See at <http://www.samoloty.ow.pl> .

- Triplex boom to add: Blohm und Voss Bv P.170.01, P.192, SNCA Sud-Est SE.500, Martin 189 (serious); Focke-Wulf/ Ludgate Fw 1900, North-American/Ludgate XPC-51 Mule, North-American P-51O & Fw-5100 (fiction).

- Twin-pod flying wings to add: Fauvel AV.30 & Tank aérien & Croiseur aérien.

- Double twin-boom: Lockheed/Brooks Dual-Lightning & Lockheed/Petrie P-38T Twin-Lightning (fiction)

- In *Supplement Nr.1*, I decided to include fiction models, but there is one consequence I have not understood first: I could have turned all the *imperfectly-twin-boom real-projects* into *perfectly-twin-boom fiction-projects*. Here I will not include all these ones, just some of the imperfect twin-boomers illustrated in the first book:

- * Blohm und Voss **P.208.02** with wing-tip pods extended as booms (not a flying wing anymore) to improve the elevator and rudder efficiency.

- * Lockheed **Canard P-38-2** with the foreplane removed from the central pod (no more 3rd boom), and put on the booms, lengthened to receive heavy double-engines (total: 4).

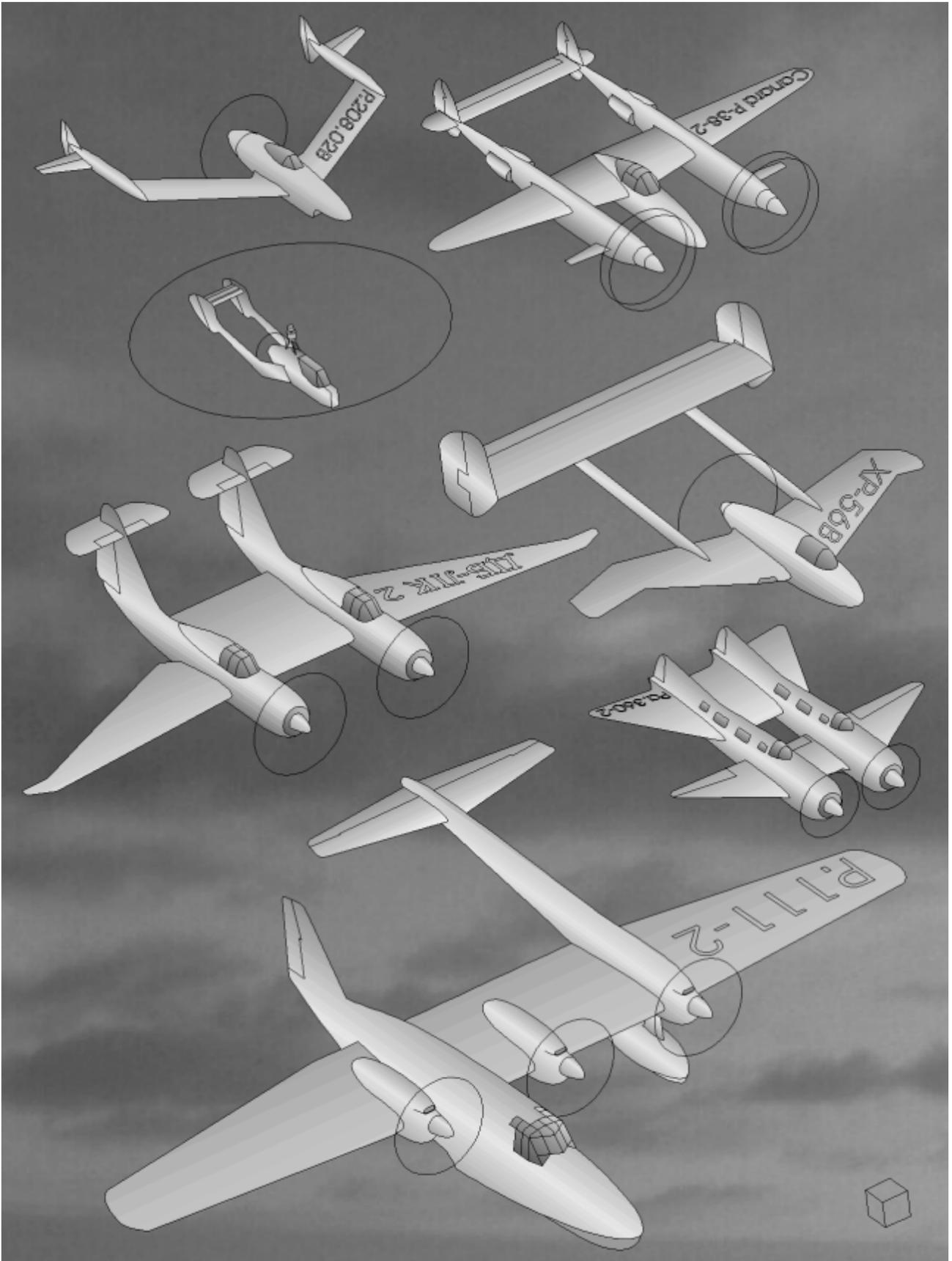
- * Doblhoff **WNF 342 V9** with linking beams included in the main booms (no more several booms as total) to ease manufacturing and decrease cost.

- * Northrop **XP-56B + Auxiliary Wing** with fin removed from the central pod (no more 3rd boom for the couple), Northrop having improved the control of flying wings.

- * Byelyayev **DB-LK 2** with lateral pods extended as fuselages (not a twin-pod anymore) to strongly improve the elevator and rudder efficiency – the Dvukhvostka-2 would be very similar.

- * Payen **Pa.360-2** with the wing separated from the foreplane (not a flying wing anymore) to improve airflow and avoid vortex drag.

- * Blohm und Voss **P.111-2** with the fin moved from the long boom to the short main pod. There is no good reason for that, but that creates a very special twin-boomer, an asymmetric like I have never seen...



MORE DEFINITIONS AND QUESTIONS

After the 11 twin-boom definitions detailed in *Supplement No.1 to Forked Ghosts*, new ones :

- (In-line Hachette Multimedia dictionary)

Different structures including two parallel booms and especially elements linking tailplane and wing or fuselage, on some airplanes.

à Classification according to our usual map (below): (A: yes – B: no) C: no – D: no? – E: yes – F: yes – G: no – H: no – I: yes – J: yes

- (nmstc glossary on the Net)

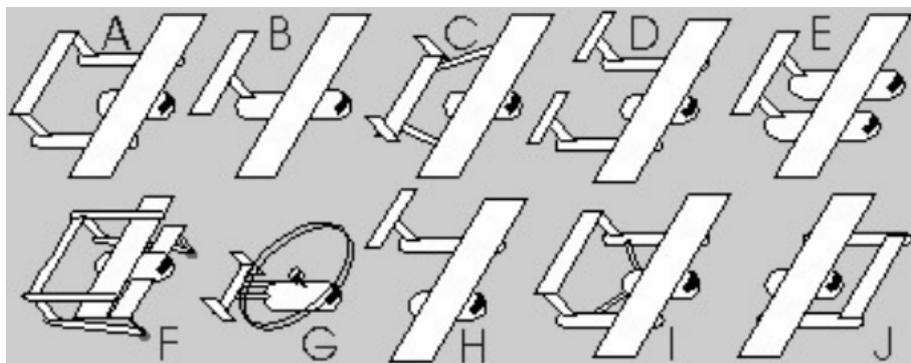
Airplane with two long structures looking like slim fuselages linking its wings and tailplane.

à Classification according to our usual map (below): (A: yes – B: no) C: yes – D: no? – E: no – F: yes – G: no – H: no – I: yes – J: yes

- (Air's Dominique Lemaire)

An airplane has a twin-boom layout if its forward wing and rear fin are linked by 2 fuselages.

à Classification according to our usual map (below): (A: yes – B: no) C: yes – D: yes – E: yes – F: no – G: no – H: no – I: yes? – J: no



The Rotoron X100 would be excluded by the first definition (not parallel booms, not airplane), the second and third (no wing, not airplane). But if this X100 is not a twin-boom aircraft, what is it??? These words wanted to explain they concern aircraft, and not drilling machines nor lifting devices (that have no tail) but they forgot many possibilities... Once more, these were first-try definitions, drafts, but they are not at all final words to define the subject.

The third definition focusing on fin(s) is very interesting, very different, as the Polikarpov 1943, Fw 5100Z, XP-55Z, for instance, would be excluded, their fins being located on the wing while just the tailplane is distant, supported by booms.

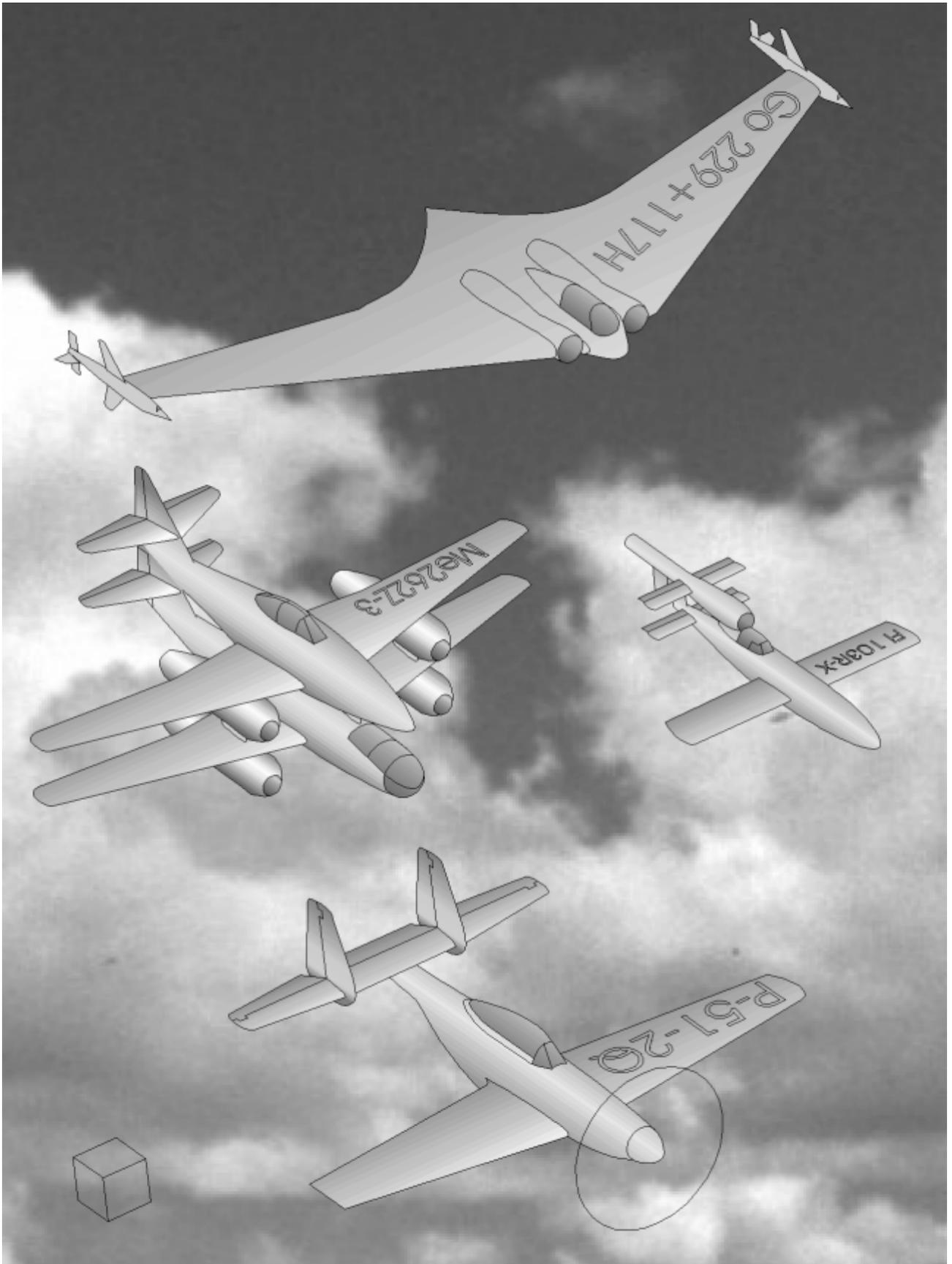
- Some questions remain about the extension of our *twin-boom* definition :

- * I wondered how would have been classified a flying-wing holding 2 missiles with their tailplanes - like a Horten/Gotha **Go 229** with 2 Henschel **Hs 117H**... Maybe it would be close to my XP-56B + Auxiliary Wing: with tails not belonging to the main aircraft itself. Twin-boom temporary couple?

- * Other definition problem: can an engine pod be counted as a boom – on the famous Sea-Wind flying boats, for instance ? Of course, if the fuselage itself carries the tailplane all alone, a connecting fin to the engine (like on the V1 rocket) is not enough to say that this engine pod *is carrying the tail*. Though, if there are tailplanes also on the engine-pod, that may be a twin-boomer according to my definition. I illustrate that here with a Fieseler **Fi 103R-X** including a biplane tail. Twin-boom or not?

- * Next question : should the Mistel couples be counted as twin-boomers if they had a solid and simple link? I don't know the answer, but I illustrate such a quiz with the fiction **Me 262Z-3** : not lateral as the Z-0 to Z-2 or 362/462, without disposable lower-part like the Mistel 262+262...

- I have tried in vain to find other definitions. Many languages just use a description without a special word connected to a definition. Though, Olivier Lacombe told me that in Québec (French-speaking Canada) the P-38 family is not called “bipoutre” but “à 2 queues” (twin-tail). That may lead to another confusion : twin-tail = twin-boom or twin-fuselage (P-38 or P-82)... or else twin-fin (Bf 110 or F-18 – here: P-51-2Q).



- I have been surprised also to read on the Internet that the P-38 is sometimes described as twin-fuselage. For me, the 2-cockpit P-82 Twin-Mustang has 2 fuselages while the P-38 Lightning has one pod/nacelle and 2 little beams, but nothing is clear : do we call *fuselage* the structure holding the tail (port side of Bv 141, central structure of DB-LK) or the structure where the crew is (starboard side of Bv 141, lateral pods of DB-LK) ? Nothing is simple, when these 2 features are separated, not matching the usual definition... According to Bill Gunston's Jane's Aerospace Dictionary, the fuselage is *called nacelle when tail is attached to booms*, so the P-38 would have 1 fuselage, central, the Bv 141 one, starboard, and the DB-LK two, lateral... My opinion is that everybody has the right to present a personal definition/classification, different, as long as authorised experts are not convincing, just powerful enough to make dominating their very dubious choice.

- New puzzles :

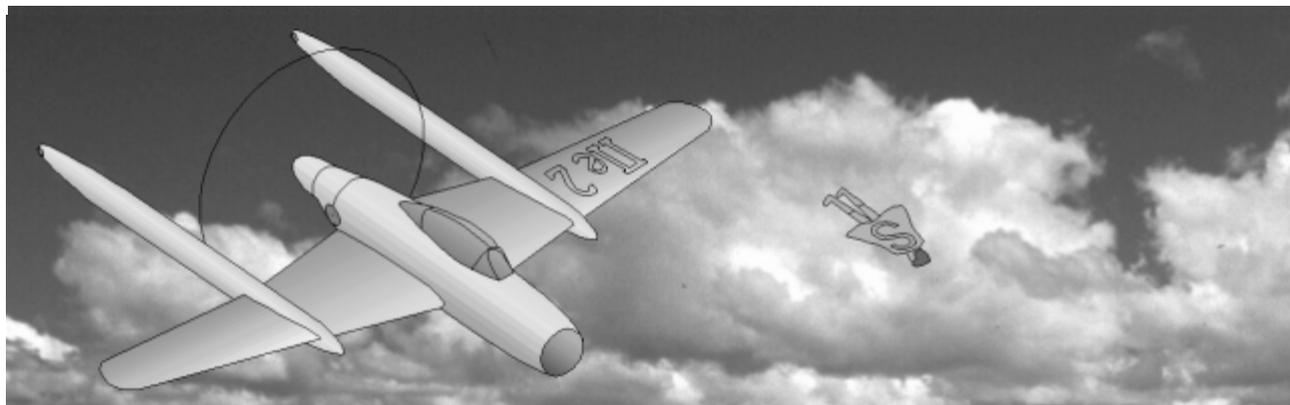
- * Can a 3-fuselage plane be a twin-boomer ? The question concerned the 3-bodies 1964 project of triplex Vickers VC-10, and I present this here as the 6-engined triplex-Dakota Douglas/Mumford **VC-53 Skyboomer**. According to me, this is a twin-boom model as the central pod carries no tailplane nor foreplane nor fin. So this is a kind of pod-and-booms aircraft like the P-38 and the preliminary DH.106 with a very big passenger pod. 3 cabins (VC-53) or 3 pods (**P-38T**) do not mean 3 booms... And the 4-engined double-Dakota **MC-53**, close to the Myassishchev M-90 modern design, would have 2 booms carrying the tail above and 2 passenger pods below.

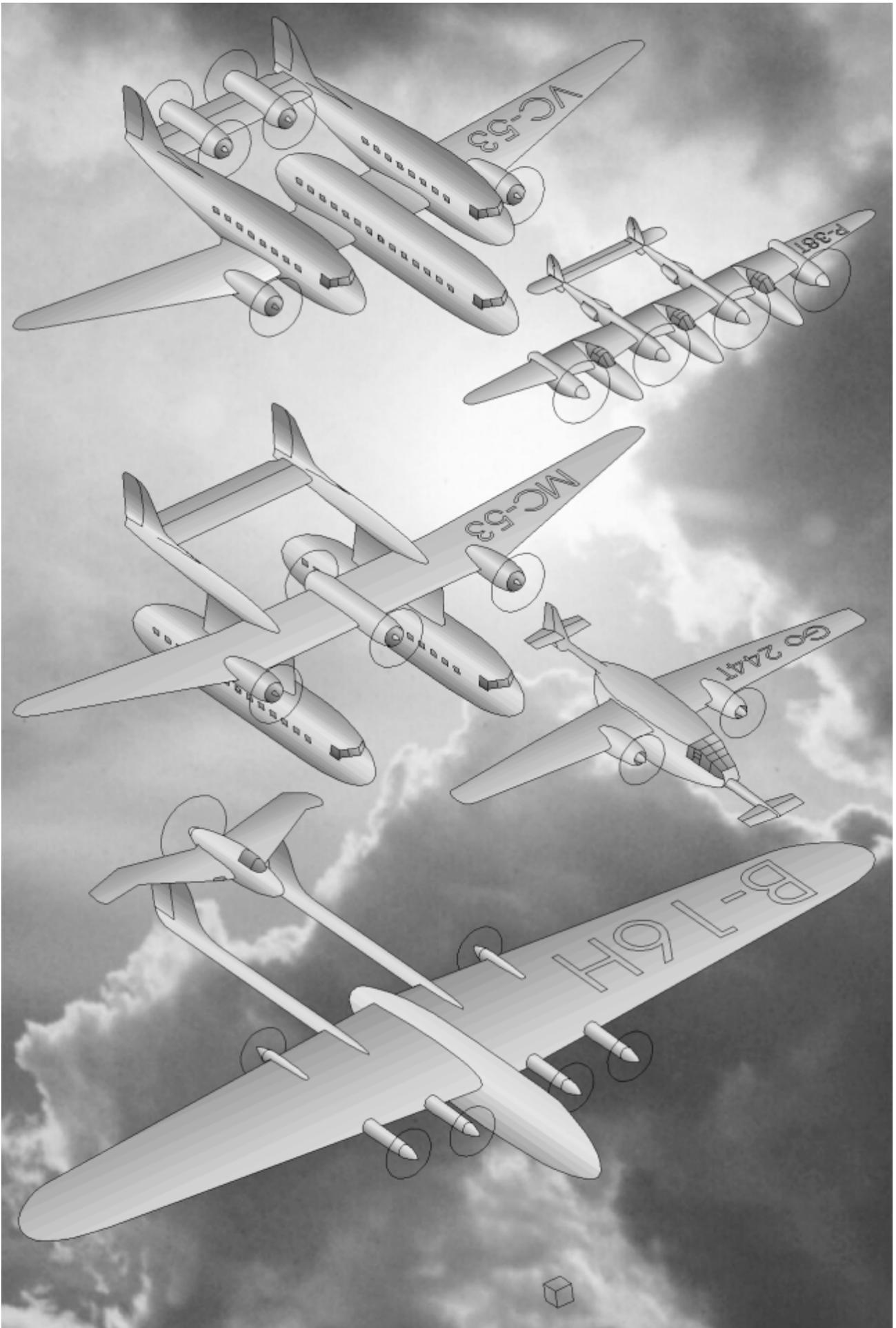
- * Accepting any double booms carrying tailplanes or foreplanes would have an unexpected consequence, that I mentioned in my 1994 book *Catamarans in the Sky*: that would include in the twin-boom family models like the **Go-244T** here, so different...

- * If the tailplane includes a pod with a rear fin, is this a third boom or not ? I illustrate that here through an old What-if derivative of a nuclear twin-boomer, where the crew was located on the tailplane and could escape in emergency turning the tailplane into a tailless aircraft... With a flying-wing as tailplane, this would be a twin-boom composite, no problem, but if there is a fin behind the cockpit (like on the XP-56, not the 56B), I do not know... I could have presented this question through a XB-35, but Joesus suggested to use a XB-16A twin-boom basis, and that could fit: this Martin project of 1935 was not older than the famous XB-17, while the B-17H version has been created in 1944. Thus, this **B-16H** puzzle, to be imagined with and without a fin aft of the rear pilot.

- The end :

Somehow: an aircraft with 2 booms is a twin-boom-aircraft, no matter if there are on them tail-planes/fins like I required, or propellers (Vought XF5U) like I rejected, or balance devices that are not surfaces (twin-NOTAR single-propeller **Pelyenbyerg Pe-2**)... If I found discrepancies between definitions, this came only by studying special cases not taken into account by professional writers and engineers, so deciding to ignore abnormal twin-boomers was logical self-contradiction... In 1993 (*Catamarans in the sky* book) I decided not to take into account twin-boomers with separate tail-planes (He 111Z, Airtruk) or up-and-down booms (Sablier 19/20, Pretzel) then I changed my mind in 1997, but still refused the XF5U. Well, either I should have kept on focusing on a very precise layout (*twin-tail-booms*, now on the cover title...), or either accept all types than can be related to the word *twin-boom*. Including **flying Superman**, with 2 legs carrying feet... Now, I just give up, sadly, my project of a complete collection... *Farewell*...





SPELLING PHILISOPHICAL PROBLEM

I must explain why I changed my way to spell *names coming from different alphabets than Latin*. From the surprising French-like Mitsoubichi to the common English-like Mitsubishi. It may seem a detail but it is not, not at all...

I have not turned to English because President George Bush Jr said America will rule the World and any French disagreement will be punished. As well, I had not chosen French in pretending like Napoleon that France must dominate the World and English must be crushed. And this is not diverting completely out of the 1939-45 twin-boom subject here: the *technical race for aircraft performance through unorthodox ways* (twin-boom, twin-fuselage, etc) occurred because a terrific war happened when Hitler tried to make Germany dominate Europe. Then the Pacific War (1941-45) happened when Japanese generals tried to dominate Asia instead of European invaders (and their cousins that had invaded America)...

I do not want at all to elect one national language and crush the others, I am going to explain.

* PHONETICS

Logic is very possible in writing/reading, even if there is not only one way: French-English, Hebraic-Arabic, Greek-Russian (and Japanese partly), etc. have different alphabets but they all follow the nice principle *Write what you Pronounce*, and each group of signs (= sounds) has a meaning that you just have to learn. This is completely different from Chinese (and antique Egyptian, and Japanese kanji writing), where are drawn signs which have both a meaning and a pronunciation, that you have to learn, both. A Chinese reader seeing an unknown character in a newspaper cannot recognise a word he has just heard till then, and he cannot read it aloud to ask the meaning to a distant friend: the writing is not connected to sounds at all. Thanks to our forefathers, it is more simple for us: we write the signs giving the pronunciation.

Alas, I have not been educated in writing all with a universal phonetic alphabet, and it is difficult to handle spelling problems of each language. Example: in French (and English), there is no letter to write the throat sound KH-GH (or CH-J of *loch-jota*) and the different clicks of the Bushmen... Anyway, I have tried in my first book *Forked Ghosts* to apply the basic rules I had learnt, to write Russian and Japanese names in letters required for printing (and for reading by my relatives). These are French rules just because my family has been educated in France. Besides, on the graphic drawings, I have always tried to put the original writing (wherever a source was available), respecting foreign systems completely.

* NOT NATIONALISTIC

Then, discovering the Internet, I realised completely that the international language is English, and to reach friends world-wide (Australia, USA, UK, Netherlands, Ukraine, Spain, Japan, Germany...), I should speak English rather than French. I agree, without any nationalistic pride, willing to be understood, at least a little. My words are probably very imperfect for the English readers, but this is just an unskilful try from a foreigner, not a reference book to be published in UK or USA.

Now let me say that classical English is a very imperfect tool *for writing*:

- In English, there is no way to write the French sounds EN-AN-ON-UN-IN-AIN, U-E-EU-Œ. Fortunately, this general problem has no consequence here as such sounds do not exist in Russian and Japanese as well...

- In English, it is very difficult to guess the required pronunciation for vowels (*chicken-bird-file, full-duck-tube, any-packet-pace-again, eleven-dew-files, why-worry-toy, lord-love-down-women*). Writing in a truly-phonetic alphabet would be much better.

- I disagree about the spelling of many English authors translating the Russian E and Ě as E. I have learnt Russian during several years, and I use the closer YE/YO in this book (to be read correctly), even if I used the usual spelling on my Internet site, for the Search tools to find aircraft names as they are written most of the time. Mr Gorbachev was called Gorbachyov in Russia, why don't we say the same? If the *reason* is trying to keep Russian letters, we would write **Gopbacheb**, not Gorbachev (and for aircraft: Cyxou instead of Sukhoi...), and of course we do not.

No logic, no coherence, just wrong decisions of bad experts, proudly keeping the status of *decision makers*...

Thinking about a language for the World:

- I agree that French is an awfully complicated language, not deserving at all the place of international tool – mainly because of the gender complete puzzle (a lamp and a mouse are feminine, a bed and a rat are masculine, why?) and very difficult conjugation of verbs (even if there is not the German/Russian/Latin difficult declension changing nouns depending on grammar).

- I regret that a very simple language has not been adopted internationally, maybe like Esperanto. Anyway, spelling should bring what is needed to pronounce, not requiring more (useless rules) and not giving less (leading to wrong reading). English has been selected for international speaking as the most simple usual language, and I accept that perfectly, but the international version of it should be simplified deeply. Removing exceptions (accepting mouses, he do, shaken, ...) and most of all writing always what must be pronounced: the vowels would be clear (and new consonants would replace the doubles sh-ch-th-kh-gh-zh-wh-ph while new doubles would replace the unclear j-x that correspond to dzh-ks-gz). That would ease a lot the reading & writing learning-course for young children of all next generations, and ease deeply the access of everyone on Earth to a common language. This would help bringing peace to the World, with no more rejection of foreigners (and dyslexics). This is just a wish... I am peacefully daydreaming of what might be better, I will not make war saying to everyone : *obey this new law of mine, or dye*...

* RESPECT

I have seen on TV the leading 'intellectuals' refuse any spelling simplification (like writing *atak*, automatically from pronunciation, instead of learning to write *attack* precisely), because of a holly requirement to respect tradition. I disagree completely: let those tradition-enthusiasts remember the old complicated rules and millions of special cases, and apart of this hobby for a few ones preferring word-History than sports or models, let us all communicate as simply as possible. In democracy, there is no reason anymore to keep a very complicated system making a rich elite free from the hard-working of common people. Of course, the spelling-experts refuse to loose their rewarded superiority in handling the mountain of exceptions, but the people should not accept their mandatory requirements, and in democracy the majority decides (theoretically...).

In Russia, before deciding *school for everyone*, half of the Cyrillic letters, useless, have been discarded, Latin countries should have done something similar. It was good to understand that everybody can read and write, not just the aristocrats and priests, but to ease this access to everyone, an adaptation would have been wise: keeping only what is actually needed. Now, it is probably too late: I understand that changing all and learning new (simplified) rules would be uncomfortable for the billions of grown-up educated adults, and as young (and future) children are not allowed to vote, of course, democracy will not lead to a better system. Democracy or not (and as well: communism or not, Christendom or not) selfishness is the natural secret rule: the main goal is my own comfort, no matter the other ones... so, most of the people will require to keep what they use locally now, and most of the powerful Americans will require the world-wide language for ever to be what they use themselves now.

Though, there is some hope in this cruel World : many kingdoms have disappeared even if kings/queens had the power, single-party has disappeared even if it had the power, male domination is disappearing even if only men had the power, nationalism tends to disappear in Europe even if local chiefs have the power (and changing for a common money – except in UK – has been done even if it was not comfortable)... History is not an icy immobility in the name of mandatory respect towards the past. Future may be better, while any change may be refused and lead to War...

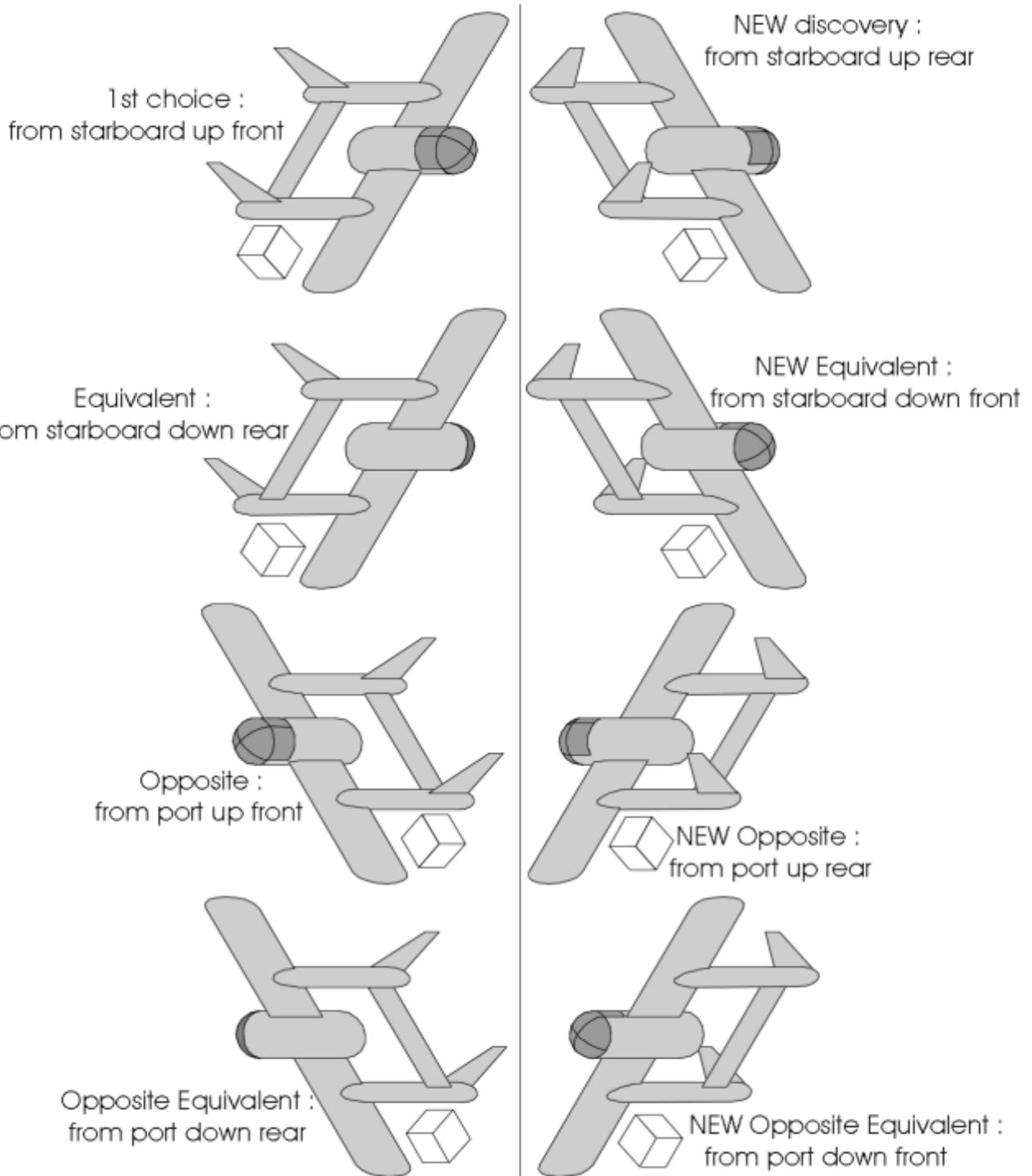
Anyway, I dream of civilian peaceful twin-boomers linking countries and featuring panoramic views, more pleasant than military efficient killers...

MATHEMATICAL DETAILS

In *Forked Ghosts* was presented the resulting tools of my personal trigonometric calculations, used for every drawing : from a 3-view plan, building a slanting view, and the reverse action that may be necessary previously: from a photograph or art, building a 3-view drawing. Though, with 2 new pictures (Junkers and Rosσμαier), this calculation was unable to find results: arcsinus of a figure above 1, which is mathematically impossible... And visually the angle between “tail to nose” and “tail to fin top” was less than 90° instead of more than 90°, even if the “tail to nose” direction was standardised as “horizontal, left to right”.

PRINCIPLE:

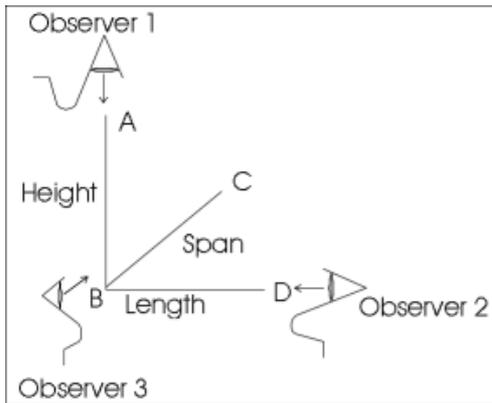
Thinking it over, it appeared that 2 kind of slanting views are possible (each one generating 3 derivatives), not just one (that would generate 7 derivatives):



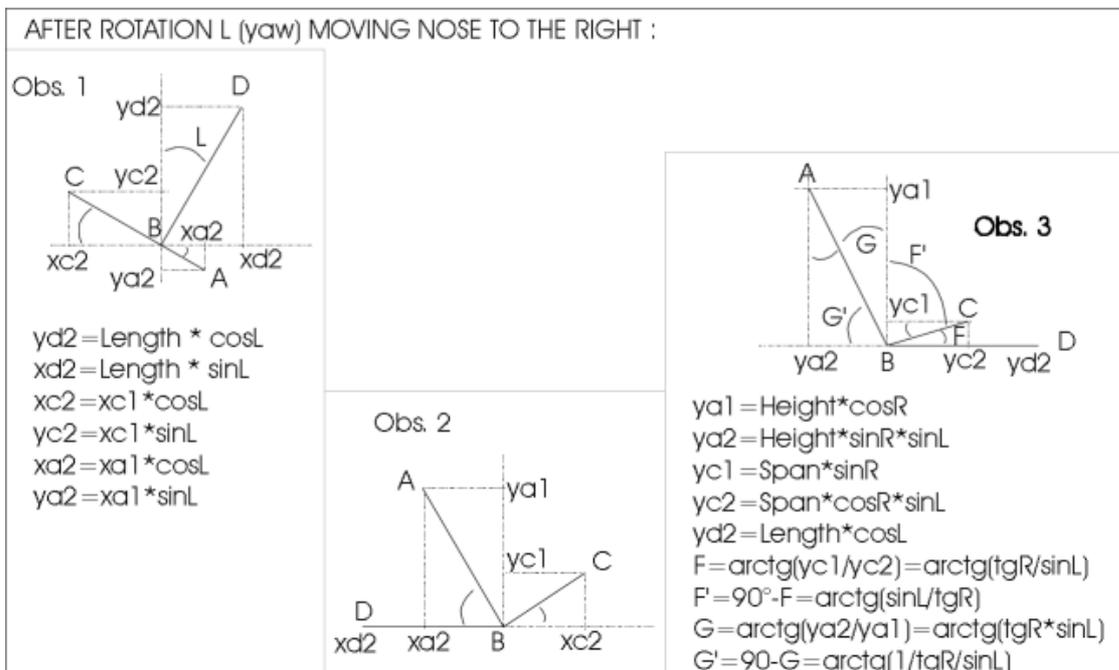
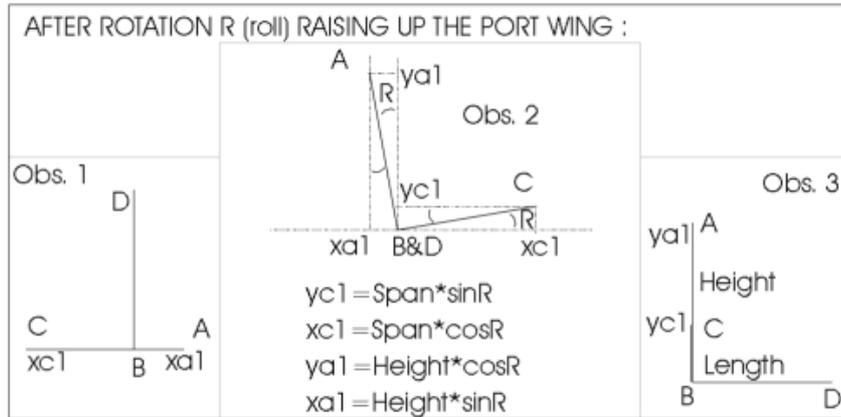
It seemed all my calculations had to be checked and changed and adapted, and alas I had lost my 1997 papers justifying my Excell finished tools, published. Though, after several months of deep effort, all was found again, and extending that to the other case (turning the nose to port and not to starboard, after raising up the left wingtip) gave surprisingly very similar formulas. And a drawing try confirmed: there is just a need to change the skewing direction at each step, so the sign of the Corel Draw Skew functions.

Not to loose again this tedious analysis, it is written down here, below and next page. It is a personal way discovering again what may be well known as 'isometric projection' principle, to create or read slanting views without conical (very short distance) effect.

TRIGONOMETRIC BASIS:



INITIAL :		
Observer 1 (from above)	Observer 2 (from front)	Observer 3 (from starboard)
D	A	A
Length	Height	Height
C	Span	Length D
B&A	B&D	B&C



FIRST ADAPTATION TO SKEW FUNCTION OF COREL DRAW 6:

For the side-view (vertical Height / horizontal Length):

Scale: Vertical: $ya1/Height = \cos R$; Horizontal: $yd2/Length = \cos L$

Skew: Horizontal: $+G$ (counter-clockwise) = $\arctg(\tg R \sin L)$; vertical: 0

For the view from above (vertical Span / horizontal Length):

Scale: Vertical: $yc1/Span = \sin R$; Horizontal: $yd2/Length = \cos L$

Skew: Horizontal: $-F'$ (clockwise) = $\arctg(\sin L / \tg R)$; vertical: 0

For the view from front (vertical Height / horizontal Span):

There is a need to skew in both directions Horizontal and Vertical, and for that, we need to know precisely how the figures combine, from the source (R,L) to the intended result:

Scale: Vertical: eV ; Horizontal: eH

Skew: Vertical: $V(^{\circ})$; Horizontal: $H(^{\circ})$

SKEWING IN BOTH DIRECTIONS:

Experience proves that skewing according to V and H gives the same as skewing H then skewing V (and not skewing V then skewing H). The calculations involve the central point of the view from front, not B.

We have central:0,0; $xA=xB<0$; $yB=yC<0$

Scale \hat{a} $xa=xA*eH$; $xb=xB*eH$; $xc=xC*eH$; $ya=yA*eV$; $yb=yB*eV$; $yc=yC*eV$

Skew H \hat{a} $ya'=ya$; $yb'=yb$; $yc'=yc$; $xa'=xa-ya*\tgH$; $xb'=xb-yb*\tgH$; $yc'=xc-yc*\tgH$

Skew V \hat{a} $xa''=xa'$; $xb''=xb'$; $xc''=xc'$; $ya''=ya'+xa''*\tgV$; $yb''=yb'+xb''*\tgV$; $yc''=yc'+xc''*\tgV$

Final : $xa''=xA*eH-yA*eV*\tgH$ $xb''=xB*eH-yB*eV*\tgH$ $xc''=xC*eH-yC*eV*\tgH$

$ya''=yA*eV + \tgV*(xA*eH - yA*eV*\tgH)$

$yb''=yB*eV + \tgV*(xB*eH - yB*eV*\tgH)$

$yc''=yC*eV + \tgV*(xC*eH - yC*eV*\tgH)$

So, for distances with $yA-yB=yA-yC=Height$; $xC-xA=xC-xB=Span$; $xA-xB=yB-yC=0$:

1) $xa''-xb''=eH*(xA-xB)-eV*\tgH*(yA-yB) = -eV*Height*\tgH$

2) $xb''-xc''=eH*(xB-xC)-eV*\tgH*(yB-yC) = -eH*Span$

3) $xa''-xc''=eH*(xA-xC)-eV*\tgH*(yA-yC) = -eH*Span - eV*Height*\tgH$

4) $ya''-yb''=eV*(yA-yB)+\tgV*[eH*(xA-xB)-eV*\tgH*(yA-yB)] = eV*Height - \tgV*eV*\tgH*Height$
 $= eV*Height*(1-\tgH*\tgV)$

5) $yb''-yc''=eV*(yB-yC)+\tgV*[eH*(xB-xC)-eV*\tgH*(yB-yC)] = -eH*\tgV*Span$

6) $ya''-yc''=eV*(yA-yC)+\tgV*[eH*(xA-xC)-eV*\tgH*(yA-yC)] =$
 $eV*Height + \tgV*(-eH*Span - eV*Height*\tgH)$

And from that, we can find the eH , eV , \arctgH , \arctgV that we need:

(2) \hat{a} $eH=(xc''-xb'')/Span$

(5) \hat{a} $\tgV=(yc''-yb'')/eH/Span=(yc''-yb'')/(xc''-xb'')$

(4) \hat{a} $(ya''-yb'')=(xb''-xa'')/\tgH * (1-\tgH*\tgV)$

\hat{a} $\tgH=(xb''-xa'')/[(ya''-yb'')+(xb''-xa'')*\tgV/Height]$

\hat{a} $eV=(xb''-xa'')/Height/\tgH=[(ya''-yb'')+\tgV*(xb''-xa'')]/Height$

(1) \hat{a} $eV*\tgH=(xb''-xa'')/Height \hat{a}$ $eV=(xb''-xa'')/Height/\tgH$

Connection with the Trigonometric page:

$xc''-xb''=yc2$; $yc''-yb''=yc1$; $ya''-yb''=ya1$; $xa''-xb''= -ya2$; $xc''-xa''=ya2+yc2$; $yc''-ya''=ya1-yc1$

Conclusion (for building an oblique view from R, L), as % with $Span=Height=1$:

$eH=yc2=\cos R \sin L$

$V=\arctg(yc1/yc2)=\arctg(\cos R \sin L/eH)$

$H=\arctg[ya2/(ya1+ya2*\tgV)]=\arctg[\sin R/\cos L/\sin L]=\arctg(\tg R/\sin L)=F$

$eV=ya1+ya2*\tgV=\cos R+\sin R \sin L*\tg R/\sin L=(\cos^2 R+\sin^2 L)/\cos R=1/\cos R$

(for the NEW way, use $-G$ for side view, $+F'$ from above, $-H$ & $-V$ from front, same Scale)

BUILDING A 3-VIEW DRAWING FROM G, F':

$G=\arctg(ya2/ya1)$, $F'=yc2/yc1 \hat{a}$ $\tg G=\tg R \sin L$, $\tg F'=\sin L/\tg R$

\hat{a} $\tg R=\tg G/\sin L \hat{a}$ $\tg F'=\sin^2 L/\tg G \hat{a}$ $\tg F'*\tg G=\sin^2 L \hat{a}$ $L=\arcsin[\sqrt{(\tg F'*\tg G)}]$

$\tg R=\tg G/\sqrt{(\tg F'*\tg G)}=\sqrt{(\tg G/\tg F')} \hat{a}$ $R=\arctg[\sqrt{(\tg G/\tg F')}]$

Side view: Skew: Horizontal: $-G$ Vertical: 0; Scale Vertical: $1/\cos R$, Horizontal: $1/\cos L$

View from above: Skew: Horizontal: F' ; vertical: 0; Scale: Vertical: $1/\sin R$, Horizontal: $1/\cos L$

\hat{a} from L, R, calculate the eH , eV , H , V as above, then:

View from front: Skew horizontal: $-H$, vertical: 0; Skew horizontal: 0, vertical: $-V$; Scale horizontal: $1/eH$, vertical: $1/eV$

FOR THE CASE OF HEIGHT LEANING TOWARDS THE NOSE INSTEAD OF THE REAR:

For a slanting view from a 3-view drawing: measure in opposite direction the angles G (counter-clockwise) & F' (counter-clockwise), then make the usual calculations. Apply the opposite values for all skew figures.

SUMMARY OF ALL THE ITEMS

Here is the list, from *Forked Ghosts / Supplement No.1 / End*, of all the twin-boom projects presented as 1939-45 designs that I have gathered.

For a search (Has *this* twin-boomer been included? Where?), the best is not here but going on my Internet site <http://cmeunier.chez.tiscali.fr/index.htm> then ask with Edit/find (Ctrl-f).

An alphabetic list with all the possible model names/codes/nicknames, of models and designers, with the different writings for the non-Latin ones, would have been too big. And here, some abbreviations have been used: *prov.* means "provisional", *safety* means "balance preserved if one engine fails", *solidity* means "compared to a single boom equivalent", *free nose* may mean "for a gun", or "for a low door", or "for a perfect view".

SERIOUS ITEMS

DESIGN TEAM	NAME	DRAWINGS	TWIN-BOOM REASON
? (American)	Snipe	1	Free nose, efficient propeller
? (British)	Asymmetric	1	Low drag, solidity
? (Japanese)	Shofuh, Triumphant wind	1	Central jet weight, short pipe
AGA	XLRG-1, XCG-9	2	Rear post, load dispatching
AGA	Reduced scale XLRG	1	Testing twin-boom layout
Airspeed	AS.47	1	Very low drag, safety
Airspeed	AS.5X	1 prov.	Rear door
Arado	E 470	1	Load dispatching, solidity
Arado	E 530	1	Low drag
Arado	Ar 340, E-555-9/10	3	Rear post
Arado	E-555-8	1	(unknown)
Armstrong-Whitworth	AW-49	1	Free nose, efficient propeller
Bell	XP-52, XP-59	2	Free nose, efficient propeller
Bendix	51, 51A	2	Free nose
Bestetti-Nardi	BN-3, BN-4	2	Rear post, free central space
Bestetti-Nardi	Saetta	1	Free nose, efficient propeller
Blackburn	B-50	1	Central jet weight, short pipe
Blohm und Voss	P.61/110/122/124	2 prov.	Short hull, rear post
Blohm und Voss	P.123/125	2 prov.	No extra floats
Blohm und Voss	P.166	1	Load dispatching, solidity
Blohm und Voss	P.167, Bv 250Z	1	2 front doors, available parts
Blohm und Voss	P.196	1	Central jet weight, safety
BMW	TL.III	1	Central jet weight, short pipe
Boeing	368	4	Free nose, efficient propeller
Boeing	Intercontinental 1941	1	Thin rear fuselage, solidity
Bolkhovitinov/Byeryev	I, B-10, B-10M	2	Very low drag, safety
Borovkov-Florov	D, IS-207	1	Free nose, lengthened engine pods
Boudier	Brevet 886.665	1	Lengthened fairings
Boulton-Paul	P.97	1	Rear post
Boulton-Paul	P.99	1	Free nose, efficient propeller
Bowlus/Airborne	MC.1, XCG-16	2 + 1 wrong	Thin rear fuselage
Breda	202	1	Free nose
Bréguet	850, 851, 500t, 1000t	2	Load dispatching, solidity
Brewster	P.33, P.33 Rev II	1 + 1 prov.	Free nose, efficient propeller
Bücker	Bü 181/II	1	Free nose
Burnelli	Patent 2,586,299	1 prov.	Central jet weight, safety
Burnelli	BX-AB-3, Patent 2,380,289	2 + 1 prov.	Thin rear fuselage, rear post
Burnelli/CCF	CBY-3, B-2000, B-2000B	3	Thin rear fuselage
Byelyayev	EOI, PBI	2	Free nose, efficient propeller
Byelyayev	OI-2	1	Low drag
Capra	R90	1 + 1 wrong	No extra floats, low drag
Caproni	Ca.325 bis, 345, 345 bis	2	Rear post
Caproni	Ca.355	1	Free nose, efficient propeller
Caproni	Ca.380 Corsaro	1	Low drag
Charpentier	Brevet 867.149	1	rear devices
Consolidated-Vultee	Air Car	1	Free nose, removable central pod
Daimler-Benz	Projekt B, C	1	Free central space
DDMDAL	Shrike	1	Rear post
DeHavilland	E6/41, DH.100 two-seater	1 + 1 prov.	Central jet weight, short pipe
DeHavilland	Preliminary DH.106	2 prov.	Central jet weight, safety
Demaizière-Joffrin	DJ-12	1	Very low drag, safety
DeSchelde	S.26	1	Thin rear fuselage
DeSchelde	Jae 4301/4302	2	Lengthened float pods
DFS	203, 230Z, 130Z	1	Available parts
DFS	332	1	Free central wing
Diepen-Difoga	421	1	Free nose
Dornier Aircraft	Autoflugzeuge	1	Free nose, removable central pod
Dornier/Junkers/Heinkel	Do 335Z, Ju 635, Do 635, P.1075, Ju 835	2	Low drag, available parts

DESIGN TEAM	NAME	DRAWINGS	TWIN-BOOM REASON
Dupuy	monoplace	1 prov.	Free nose, efficient propeller
Fairchild/Kaiser	F-78, F-78R	2	Rear door
Fiat	G-58	1	Low drag, available parts
Focke-Wulf	Fw 189E, Fw 261/P.0310.225	2	Rear post
Focke-Wulf	Flitzer, Ta 183/184 P.IV/VIII, Fw 226, PTL-7 Peterle, JP 011, P 011-001	3 + 1 prov.	Central jet weight, short pipe
Focke-Wulf	Jäger projekt	3	Free nose, efficient propeller
Fokker	D.XXIIIDB	1	Very low drag, safety
Fokker	Ontwerp 180, 210	1 + 2 prov.	Thin rear fuselage
Gaucher	biplane	1	Free nose
General Aircraft	GAL 47 F.O.P.	1	Free nose
General Aircraft	GAL 48B Twin Hotspur	1	Available parts
Gloster-Whittle	F18/37 jet	1	Central jet weight, short pipe
Gotha	Go 244A/C-3, P.35/39/46	5	Rear door
Hall/Southern/Convair	Flying Car	1	Removable central pod
Hawker	P.1037	2 prov.	(unknown)
Heinkel	He 111Z-5, /3m, /4m	3 prov.	Available parts
Heinz	Monoplane	1	Free nose
Henschel	Transport Flugzeug	1	Removable central pod
Heston	JC.6, A2/45	1	Free nose
Hirth	Hi 24	1 prov.	(unknown)
Holste	H.20 Pe 1	1	Large tailplane
Howard	Nebesar	1	Rear door
Hughes	D-2, DX-2, XP-73, XA-37	1	Rear post
Hughes	D-5	1	Lengthened engine pods
Junkers	EF-50	1	Lengthened engine pods
Junkers	EF-112	1	Very low drag, safety
Junkers	EF-135	1	Central jet weight, safety
Junkers	Ju 290Z	1	Available parts
Kaiser	Flying Cargo Ship	1 prov.	No extra floats, solidity
Kaiser-Hughes	HK 1 Nr 1	1	Rear door
Kaiser-Hughes	HK 1 Liberty	1	No extra floats, solidity
Klemm-DFS	KI 25Z	2 prov.	Testing twin-fuselage layout
Kubala	IS/PB 2M-71	1	Rear post
Laister-Kaufman	Battle Glider	1	Rear post
Lavochkin	La VRD	1	Central jet weight, short pipe
Lockheed	L-106, Sea P-38, P-38-75mm, XP-49	3	Lengthened engine pods
Lockheed	RP-38	1	Training in lateral piloting
Lockheed	L-121/134, XP-58	1	Rear post
Lockheed	L-153-8/11	2	Central jet weight, short pipe
Macchi	MC.300 (205 bifusoliera)	1	Low drag, available parts
Mansyu	Ki 98	1	Free nose, efficient propeller
Mantelli	AM-6/8/10	2	Free nose
Martin (Glenn)	Flying Whale, Twin-Engine	2	Rear post
Martin (Glenn)	Cargo	1	Rear door
Martin (James)	Twin-Hull Ocean Plane	1	No extra floats, solidity, air-cushion
Martin-Baker	Tankbuster, Pusher	1 + 1 wrong	Free nose, efficient propeller
Martin-Baker	Push-pull	1 prov.	Very low drag, safety
Martin-Baker	Twin-Jet	1	Central jet weight, safety
Matra	R74, R75, R110	1 + 1 prov.	Free nose
Matra	R100	1	Very low drag, safety
Matra	R120	1	Central jet weight, short pipe
Mc Donnell ?	Manta, Bat	1	Very low drag, safety
Messerschmitt	Bf 109Z, Me 109Z/209Z/409/609, E2-26/32, Me 255/255', Me 409-1/2	7 + 4 prov.	Low drag, available parts
Messerschmitt	E2-28, Me 109Z'	2	Rear post
Messerschmitt	Me 323Z	1 prov.	2 noses, available parts
Messerschmitt	1939 (P.1062 ?)	1 prov.	Central jet weight, short pipe
Miles	M.58	1	Central jet weight, short pipe
Mitsubishi	Type 0 (Harry)	1	Very low drag, safety
Mitsubishi	M-70, J4M1, J4M2	2	Free nose, efficient propeller
ML Malcolm/Lobelle	Night Fighter	1	2 free noses, safety
Mojarovskiy/Vyenyevidov	BSh-MV Kombayn	1	Free nose, efficient propeller
Moskalyov	SAM-13	1	Very low drag, safety
Moskalyov	SAM-16'	1 prov.	Short hull
Moskalyov	SAM-19	1 + 1 wrong	(unknown)
Moskalyov	SAM-23/24	2 + 2 wrong	Rear door
Moskalyov	SAM-23 LT, SAM-20	1 + 1 prov.	Free nose
NIAI	Och	1	Rear post
Nihon Kokusai	Ku 7 Manazuru	1	Rear door
North American	NA-116	1 + 1 wrong	Rear post
North American	RD-1120, XP-82 single seater	1 + 1 prov.	Low drag
Northrop	NS-8, XP-61H	2	Rear post
Northrop	XP-61E	1	Available parts
Payen	Pa 141	1	Free nose
Payen	Pa 150 Otarie	1 + 1 wrong	Short hull

DESIGN TEAM	NAME	DRAWINGS	TWIN-BOOM REASON
Payen	Pa 600, Pa 42/1	1 + 1 wrong	Rear door
Payen	Pa 42/5, K 57	1	Free centre
Payen	Pa 140/190/240H	-	(unknown)
Pemberton-Billing	PB 41, Tow Fighter	2	Free nose
Pemberton-Billing	PB 43/47 Venturi	1	No extra floats, 2 free noses
Pemberton-Billing	push-pull	1	Very low drag, safety
Percival	P 35/36/37	1	Thin rear fuselage
Piper	Skycoupe, PA, PB, PWA-1, PA-7	1 + 2 prov.	Free nose
Pittcairn/AGA/G&A	PA-44, XO-61	1	Free nose
Polikarpov	Po-1943	1 prov.	Free nose, efficient propeller
Portsmouth	P.109, Aerocar	1	Free nose
Puget Pacific	Wheelair III-A	1	Free nose
PWS	46	1	Low drag
Pyelyenbyerg	1943	1	Central propeller
Reggiane	Re 2005 bifusoliera	1 + 1 wrong	Low drag, available parts
Renard	R 42	2	Low drag, available parts
Renard	R 45	1	Rear door
Rosatelli	CR 50/55	1 prov.	(unknown)
Rossmair	Flugschrauber	1	Holding 4 rotors
Roteron	X 100	1	Solidity
Rubik	R 21	1	Rear door
SAAB	Design March 21 st 1941, J.21B, L.13	1 + 3 prov.	Free nose, efficient propeller
SAAB	RX-1, RX-2	2 + 1 wrong	Central jet weight, short pipe
Santangelo	Combattimento	1	Free nose
Sato/Maeda	Kutei-Butai	1 prov.	Rear post
Saunders-Roe	P.1033	1	Removable central pod
Savoia-Marchetti	SM-88, SM-91	2	Lengthened engine pods
Savoia-Marchetti	SM-92	1	Low drag
Savoia-Marchetti	trimotore	1	Free nose
SECAN	SUC.10' Courlis	1	Free nose
Skoda Kauba	V6, initial SL-6 design	2	Testing pusher propeller
Slingsby	T-27 Black Widow	1	Available parts
SNCA Sud-Ouest	SO-1030	1	Free nose, efficient propeller
SNCA Sud-Ouest	SO-1070	1 prov.	Rear post
SNCA Sud-Ouest	E-1910	1 prov.	Large tailplane
Snead	XLRH-1	1	No extra floats
Stout	XC-65 Skycar II, UC-107 Skycar III	1	Free nose
Sukhoy	RK	1	Rear post
Tachikawa	Ki 94	1	Very low drag, safety
Tachikawa	Dai Ni An, Dai San An	2	Low drag
TsAGI	LS	1	Wing without airscrew vortex
USCG/Stephens	Glider-borne lifeboat	1	Removable central pod, short hull
Vakhmistrov	TP, MP	2	Rear door
Vickers	design 08/27/1941	1	Free nose
Vultee	V.78, V.84, XP-54, XP-68	2	Free nose, efficient propeller
Welch	OW 12M	1	Low drag, distant cockpits
Weserflug	P.2137	1	Rear post
Westland	N7/43, Ground Attack 02/1942	2	Free nose, efficient propeller
Westland	E5/42, J.15	1 + 1 wrong	Central jet weight, short pipe

LIMIT ITEMS 1, pilotless useful aircraft of those days

Aeronca	GB-1/8, GT-1/8	1	Removable central pod
IMA	Swallow project	1	Rear smoke spreading
Vakhmistrov	LB	1	Lengthened lateral devices

LIMIT ITEMS 1, pilotless toy aircraft of those days

Cole	Dry Duck	1	Guarded engine
Mc Berkely	Stella Filante	1	(unknown)
Meyer-Reichelt	model	1	Guarded engines
Motomodèle	MB.33	1	Free nose
Rinaldi	Hand Launched Glider	1	(unknown)
Winkler	Doppelrumpf	1	Available parts

LIMIT ITEMS 2, dreams of those days

Air Trails-Tinsley	pusher	1	Illustrating pusher propeller
Ethyl	The Squirt	1	Lengthened engine pods
Flying-Kotula	Airsedan	1	Free nose, guarded propeller
Newsweek	Atomic Flying Wing	1	Central engine

MODERN ITEMS : 1939-45 fiction

DESIGNER FAKE/TRUE	NAME	DRAWINGS
?/Cœur	Atlantix	1
?/Kakuki	Ki 623, Ki 75', Ki 69', Ki 77-II, 14ib, 16si, p01, C4K, Shouhou, Enrai, Godenk, Nanpu, Gassan, Rakkankou, Sinsitei, Hokai, Zuisan' Rakchokkyou, Senryu, Sohu/Sora	18
Arado/Kakuki	Ar 112, Ar 197	2
Avro/Bagnall-Ludgate	Warrior, Grenville, Twin-Lancaster	2
Bell/Meunier	P-39T, P-63T	2
Blohm und Voss/Larmanger	P.224-1/3, Bv241/241B/241TL/141Z/141Zz	12
- Ludgate-Nomura-Meunier	Bv 238Z/426/226Z, P.208.02B, P.111-2	
- Shestakov	Symmetric Bv 141, P.200Z	
Isacson/Meunier	Symmetric Zerstoror, Zerstoror 241	2
BMW/Allan-Meunier	PTL.III, TL.V	2
Boeing/Kakuki-Nomura	XB-20', XTBB, Twin-Fortress	5
- Snell-Lacombe	B-29Jhm, B-29Fwol	
Brewster/Kakuki	XP-76'	1
Bristol/Kakuki	Burglar	1
Byelyayev/Meunier	DB-LK 2	1
CanCar/Pomerleau	CCF.100-M2	1
Caproni/Meunier	Ca.382/383/384	3
Caudron/Pug-Meunier	C-714TE/T'	2
Consolidated/Nomura	Twin-Model-36	1
Curtiss/Nomura	Twin-Tigerhawk,	7
- Choy-Imwfo	P-40T, XP-55D,	
- TooCool-Journé-Aubri	XP-55Z, XP-55T, XP-73 Griffon	
De Havilland/Kakuki	Gadfly, Harpy,	7
- Fontaine-Meunier	DH.281/100T/99B/99.5/99P	
DFS/Kakuki	DFS-228'	1
Dobhoff-WNF/Meunier	342 V9	1
Dornier/Fordham	P.256Z,	9
- Hancock-Pomerleau	Do 18Z/Z-2, Do 835/835B, Do 935	
- Meunier-?	Do 3335/435Z, Do 417/217Z	
Douglas/Jschmus - Meunier	Sky-T-Raider, Sky-T ² -Raider	8
- Mumford/Pomerleau	VC-53, C-53T, MC-53	
- Wearmouth/Winthrop	C-53 Walla Walla	
Dyle et Bacalan/Kakuki	DB-90'	1
F+W/Pug	D-3805T	1
Fieseler/Meunier	Fi 103R-X	1
Focke-Wulf/Bagnall	Ta 152Z, Ta 152TL-2, Fw 190Z-TL	11
- Baker-Deweere	Fw 190Z, Fw 191D	
- Dunn-Ludgate	TF-1Z/2Z/3Z	
- Mumford-Golding	Ta 183Z	
- Mayerle-Meunier	Fw 119, Fw 262, Fw 189Ez	
General Motors/Kakuki	XFM-II/III	1
Gloster/Higgs	Twin-Meteor Mk III	1
Gotha/Kakuki-Meunier	Go 250, Go 242X, Go 244T, Go 229-Hs117	4
Hawker/Lloyd-Meunier	Hurri-Twin, Twin-Tempest	2
Heinkel/Hancock	He 177Z	8
- Swampen-Sisko	He 277Zn He 222Z/Z-2	
- Tucker-Ludgate	He 162Z/Z-2	
- Meunier-?	He 219Z, He 111Z-5	
Hughes-Kaiser/Meunier	HK-1B	1
Junkers/Hancock-Nomura	Ju 88Z-1, Ju 390Z	5
- Wearmouth	Ju 52Z	
Kawanishi/Ishiduka	J7K1, J9K1, N1W1-T, N1K1-W, N1K6-Jw So-Shiden Kai, Twin-Shiden	1
Lockheed/Kakuki-Meunier-?	P-38M2/T/DF/VG/XF/X/ LTN/Donut/P/LS/Jt,	33
- Ludgate-RcCad-Winthrop	Big/Twin/Egg-Lightning, Kiwi,	
- Zirolu-Corel-Hancock	P-38 Combat-31/pusher/DE-2/JR-3/.rcd,	
- Fordham-Halsted	Canard P-38-2, Recon P-38, F1V,	
- Hasegawa	P-74, P-74B/C, PP-3838, TP-38R,	
Martin/Joesus	B-16H	1
Messerschmitt/Bagnall	Me 284, Me 163Z/T, Me 262HG IIIZ,	21
- Meunier-Aubri	Me 409/1m, Me 309Z'/509Z/462/462Z-2,	
- Brooks-Kakuki-Shestakov	Me 262Z-0/1/2/3, Bf 184, Me 266/262V1Z	
- Zuijdweg-Nomura	Me 709/809/909/1009/1109/362/309Z',	
Mitsubishi/Kakuki-Miura-?	A8M1, A8M2, D4M1/2, A6M99, A8M1 Kai,	6
- Meunier	A6M3-Z, Harry/2p, Harry/4m	
ML/Meunier	Twin-ML	1
Mozikonig/Kakuki	Mf 207	1

DESIGNER FAKE/TRUE	NAME	DRAWINGS
North American/Cherrie	P-51P/PP/Psh/JTB/T-2/Ta-2, J.51D-21,	38
- Ludgate-Meunier	P-82J/MM'/S/W/WPP/S, XP-51D-54/38,	
- Pomerleau	P-182/5182/512/5115D, F-151D, Twin P-51G, GP-82-72/48, XP-82J, P.282, Do-251D, Bf 182Z, Me 162Z, Fw-5100B/Z, P-51/3m, P-51/4m, XP-82-00, P-82-00, Bv 182, XP-82', Scale-T², P-51X-4/8/16/24	
Northrop/Dunn-Snell-Meunier	XB-35N/N', XP-56B-Auxiliary-Wing,	6
- Pomerleau	XP-6161E, P-61EJ, P.111	
Payen/Meunier	Pa 360-2	1
Potez/Kakuki	RI	1
Pyelyenbyerg	Pe 2	1
Republic/Gifford-Meunier	Doublebolt, P-47TJ/I/Y	4
Rubik/Meunier	R-21Z	1
SAAB	J.21AB/PP	2
Savoia-Marchetti/Kakuki	SM-77'	1
Skoda/Kakuki	Bystrouska	1
SNCA Nord/AviMag	N.1480	1
Supermarine/Higgs-Durling	Twin-Spitfire, Twin-Fire, Spitfire Mk 33/145	6
- Felicioli-Kakuki		
- Spackmans-Meunier		
Tupolev/Nomura	Gigantskii	1
Yakovlev/Johnson-Ludgate	Yak 7Dv/15Dv/315	3
- Meunier		

EXCLUDED ITEMS 1 : not projects only

DESIGN TEAM	NAME	DRAWINGS	TWIN-BOOM REASON
Blohm und Voss	Bv 138		Short hull, rear post
De Havilland	DH-100 Spidercrab/Vampire		Central jet weight, short pipe
Fairchild	C-82 Packet		Rear door
Focke-Wulf	Fw 189 Uhu		Rear post
Fokker	G 1		Rear post
Gotha	Go 242/244B		Rear door
Lockheed	P-38 Lightning		Lengthened engine pods
Maeda	Ku 1		Rear post
Nihon Kokusai	Ki 105 Ohtori		Rear door
North American	NA-120, P-82		Low drag, available parts
Northrop	P-61 Black Widow		Rear post
Northrop	F-15 Reporter		Available parts
SAAB	J.21		Free nose, efficient propeller
SECAN	SUC.10 Courlis		Free nose

EXCLUDED ITEMS 2 : just before 1939 (including pilotless, dreams, fiction)

?	Gü 7	
?	Spider's Wing, The Lightning	
*/Universal	Nazi Flying wing	
*/Krimson Skies	(several)	
Abrams	P2, PC4, Explorer	
Aernova Pellarini	AER1	
Airspeed	AS.31	1
Albert	bi-empennages	
Alliet et Larivière	AL-04 Allar	
Antonov	LEM-2	1
Arado	E500	
Arpin	A-1	
Aubert	PA-60	
Benzinmotor	model	
Bestetti Nardi	BN-1	
Blohm und Voss	P 28, P 42, Bv 138	
Boeing	320	
Bréguet	803	
Burnelli	2,224,641 – 2,181,574 – 2,286,341 – A-1	3
Byelyayev	DB-LK, Dvukhovostka	2
Campbell	monoplane	
Canadian	indoor model	
Caproni	Ca 150	
CCF	CB-34	
Coanda	twin-boom jet	
Comper-Scamp	Interavia	
Cunliffe-Owen	OA-1	
DeSchelde	S.19/20/21/22/24/25	
Douglas	Lindbergh proposal	
DTD	Biplane Fighter	1
Focke-Wulf	Fw 189, Fw 198	1
Fokker	D.23, T.6, G.1	
	Ontwerp 129/135/147/152/155/156/157/160	

DESIGN TEAM	NAME	DRAWINGS
Fouga	torpilleur	
General Aircraft	GAL.33 Cagnet	
Gloster	F18/37	
Gotha	P.3001/3002	
Gribovskiy	G-17	1
Grokhovskiy	G-11 (SSR-123)	1
Hamburger	P.19, Ha 138	
Hughes	1936, X-608	
ITS	8	
KB-2	PI, LSB	
Latécoère	673	
Letov Š56	1	
Lockheed	22, 24, X-608, XP-38, P-322	
Luscombe	6 passenger	
Mantz	pusher	
Martin (Glenn)	142, 193, Twin-Mars, 151K-1, XB-16	
Mc Gaffey	Aviate	
Mitrovitch	MMS3	
Polikarpov	SI, TsKB-21	
Praga	E-48/51/52	
Rocket Plane	model	
Saalfeld	Möwe	
Saiman	LB-2	
Schmued-Beeman	Twin-fuselage fighter	
Seversky/Republic	Super-Clipper	1
Shereshaw	Gas model	
Stearman-Hammond	Y	
Weick	W-1	
Wiener-Neustadt	Wn 16	
Willoughby	Delta F, Delta G	
W.W.S.	1 Salamandra	

EXCLUDED ITEMS 3 : just after 1945

Aernova Pellarini	AER1	
Airmaster	Aircar model	
Air Trails	Atomic aircraft	
Alliet et Larivière	AL-06 Frégate	
Alyexyeyev	I-218	
Anderson-Greenwood	AG14	
Boggs	Airmaster	
Bréguet	950	
Convair/Stinson	106 Skycoach	
Curtis-Wright	CW-21	
Dreamer	model	
Elfred	ED-2 Flyer's Dream	
Hughes	XF-11, R-11	
HWL	Pegaz	
Kaiser-Hammond	Aircar, Y-2	
Lasserre	GL3 Libellule	
Lawrence IT	Special racer	
Platt-LePage	transport helicopter, Skycrane helicopter	
SAAB	J.21R	
Skycraft-Skylark	246/446	
Skyryder	model	

EXCLUDED ITEMS 4 : not exactly twin-boomers

Antonov	KT	
Byelyayev	DB-LK, Dvukhovostka	2
Blohm und Voss	P.111, P.170.01, P.192 P.208 to 215	1
Doblhoff	WNF 342 V3/4	
Heinkel	P.1078B	
Fauvel	AV.30, Tank aérien, Croiseur aérien	
Fieseler	Fi 168	
Focke-Wulf	P.0310.251.006	
Gotha	Go 237A	
IMA	Swallow (final)	
Lockheed	P-38 canard	1
Martin	189	
Michelet	Rubis	
Miles	Magister & Auxiliary Wing	
Nikitin	PSN-2	
Payen	Pa 360/370/445	
Skoda-Kauba	final L-6	
SNCA Centre	NC-1070/1075	
SNCA Sud-Est	SE.500	

THIS AUTHOR ALSO WROTE...

* 1980 to 1992 writing, published in 1993 by La Pensée Universelle:

“Douces et silencieuses, peut-être malades” (mild and silent, maybe ill) [Love stories] By: ‘Emmanuel Rozenblatt’, French text

* 1980 to 2000 writing, printed in 2000:

“Ma copine tortue” – ‘Volume 1: Petite pâtissière en sucre’ (my turtle girlfriend – little sugar cake salesgirl) [Love stories] By: ‘Sylvain Métailié’, French text

* From 1984 to 2000 writing, printed in 2001:

“Ma copine tortue” – ‘Volume 2: A demie cinéophile’ (my turtle girlfriend – half movie fan) [Love stories] By: ‘Sylvain Métailié’, French text

* 1989 writing, printed in 1989:

“Démonstration statistique d’une escroquerie” – L’encyclopédie des avions de A à Z (Statistical demonstration of a swindle – The encyclopaedia of aircraft from A to Z) [Logic & Aviation] By: Christophe Meunier, French text

* 1991 to 1993 writing, published in 1993 by La Pensée Universelle:

“Contre la Réalité” – ‘Légitimité de la fuite vers un monde intérieur’ (Against Reality – Logical reasons to turn towards dreams) [Philosophy & Logic] By: ‘Emmanuel Rozenblatt’, French text

* 1992 to 1993 writing and drawing, published in 1994 by La Pensée Universelle:

“Catamarans du ciel” (Catamarans in the sky) [Aviation] By: ‘X.Toff’, French text with drawings and short English summary

* 1996 to 1998 writing and drawing, printed in 1998:

“Fantômes fourchus” – ‘Les projets d’avions bipoutres dessinés entre 1939 et 1945’ (Forked Ghosts – The twin-boom aircraft projects designed between 1939 and 1945) [Aviation & Logic] By: ‘X.Toff’, French text with drawings and short English summary

* Published in 2000 by La Plume du Temps:

“Fantômes fourchus” – ‘Les projets d’avions bipoutres 1939 - 1945’ [Aviation] (The twin-boom aircraft projects 1939-1945) [Aviation] By: ‘Xavier Toff’, French text (truncated) with drawings and short English summary

* 2000 to 2002 writing and drawing, published in 2002 by La Plume du Temps:

“Complément n°1 à Fantomes Fourchus” – ‘Les projets d’avions bipoutres: 1939-1945’ (Supplement Nr.1 to Forked Ghosts) [Aviation] By: ‘Xavier Toff’, French text with drawings and complete English translation

* 1997 to 2004 writing and drawing, printed in 2004:

“Mustangs Virtuels” – ‘Jouer avec le profil du ‘plus bel avion du monde’ ‘ (Virtual Mustangs – Playing with the profile of ‘the most beautiful aircraft in the world’) [Aviation & Logic] By: ‘X.Toff’, French text with drawings and complete English translation

* 2002 to 2004 writing and drawing, printed in 2004:

“The end of Forked Ghosts” – ‘Twin-tail-boom aircraft designs of 1939-45, facts and fantasy’ [Aviation & Logic] By: ‘X.Toff’, English text with drawings

* 2003 writing, web-sites in 2003, updated in 2004:

“Asymétriques ou bipoutres” – ‘Fantaisie logique en aéronautique’ [Aviation & Logic] By: ‘X.Toff’, French text with drawings

“Asymmetrical or twin-boom” – ‘Logical fantasy in aeronautics’ By: ‘X.Toff’, English text with drawings

* 2003 writing, web-site in 2004:

“Le scandale d’une Science qui est secrètement illogique” (The scandal of a Science which is secretly illogical) [Logic] By: Christophe Meunier, French text

* 2004 writing, web-site in 2004:

“Ne plus distinguer racisme et anti-sémitisme” – ‘Logique absurde d’un sang-mêlé sémite, soigné pour troubles mentaux’ (No more distinguishing anti-Semitism from racism – absurd logic of a Jewish half-breed, under treatment for insanity) [Logic] By: Meunier, French text