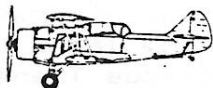




Wright F2W-2



Boeing F3B-1



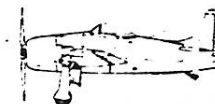
Vought XF3U-1



Wright F2W-1



Hall Aluminum XFH-1



Grumman F8F-1

MAX - FAX

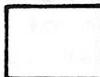
THE NEWSLETTER OF THE D.C. MAXCUTERS

MARCH APRIL 1986

MEMBERSHIP

Dues for membership in the D.C. Maxcuters is \$10.00 per year for residents of the U.S.A., Canada, and Mexico, and \$11.00 for all other countries. Your mailing label indicates the year and month of the last issue of MAX-FAX for your current membership. A red mark in the box below is a reminder that your current membership is nearing its end. Send a check, payable to D.C. Maxcuters, to the Treasurer.

DUES REMINDER



PRESIDENT

TOM SCHMITT
11014 Marcliff Road
Rockville, MD 20852

SECRETARY

BILL POOLE
9301 Lynmont Dr.
Adelphia MD. 20783

TREASURER AND NEWSLETTER EDITOR

ALLAN SCHANZLE
2008 Spur Hill Dr.
Gaithersburg, MD 20879

MEETINGS

The D.C. Maxcuters hold meetings on the first Wednesday of every month at the College Park Airport, the oldest continuously operating airport in the world.

UPCOMING EVENTS

- March 8: Patuxent River NAS Contest. 9:00 to 5:00. For more info, call Tom Schmitt (301 530-0327) or Claude Powell (301 872-4105).
- March 22: Peary High School, 2:00 to 5:00. NOTE LOCATION!! Peanut Scale contest.
- April 5: Peary High School, 2:00 to 5:00.
- May 11: Helicopter/Autogyro Contest at COMSAT.
- June 21: Spitfire Contest at COMSAT.
- July 18-20: FAC NATS.
- July 27: H.L. Glider/P30 Contest at COMSAT.
- Aug 24: CO-2 Scale Contest at COMSAT.
- Sept 6: MAXCUTERS SUMMER FUN FLY at COMSAT.
- Sept 28: Old Timer Rubber Powered Contest at COMSAT.

CLUB NEWS

ALLAN SCHANZLE

THE MAXCUTERS WILL have their Spitfire Commemorative Contest on

Saturday, June 21, 1986. What better way to celebrate the first day of summer? The events will be of a varied nature; some serious competition, some involving fun and luck.

1. FAC Scale
2. Mass Launch
3. No-Cal (Profile)
4. Trans Channel Navigation
5. Target Flight Time

All aircraft must be rubber powered, but no size limitations will be enforced except for No-Cal, which is limited to 16 inches. All models, except No-Cal, will automatically be entered in FAC Scale so the C.D. can easily enforce the 40 point minimum standard.

The first three are traditional FAC events, but No-Cal aircraft cannot participate in the first two events, nor vice versa. The Trans - Channel event will be a single mass launch, similar to our previous Trans-COMSAT competition. The last event, Target Flight Time, will be light hearted in nature, but NOT open to No-Cal aircraft. All entrants will line up in the launch area, and every flier will have his own timer. Each contestant will draw a slip of paper from a hat, and these slips will have numbers from 20 to 45 written on them. This will be your target flight time (in seconds) and you will be given two minutes to wind your model with the goal of having your Spitfire fly for your specified endurance. A mass launch will follow, and the individual whose actual flight time comes closest to his target time will be the winner. In the event of a tie for first place, a second round will be flown by the winners using new selected times from the hat. Sorta resembles a crap shoot.

Points will be awarded for each event: 3 points for first, 2 for second, 1 for third. A grand champion will be selected based upon the total points earned for all events, and this individual will be awarded a free one-year subscription (or an extension of an existing subscription) to MAX-FAX. The official flying will begin at 12:00 noon. FAC Scale judging will be held at 1:00 P.M.. So how 'bout it folks? Come to COMSAT on June 21. I should be fun. And where else will you be able to see a whole squadron of Spitfires in the air simultaneously?

YOUR EDITOR HAS had quite a few inquires into "wha's hap-nin" to the FLIGHT DESIGN model kits produced by Jim Booker in Mount, Airy MD. I called Jim to get the straight poop, and he offered information to the effect that serious personal problems necessitated selling his hobby and craft store in Frederick MD. as well as taking on a new full time job. He assured me that all orders will eventually be filled, but it will take time. That's all I know gang, but I'll keep you posted of any additional news.

ONE OF YOU out there wrote a note along with your dues renewal and asked about the Curtiss Tanager. I've misplaced the note and don't remember the specific question (I think it dealt with the color scheme for this aircraft) nor do I recall the individual who made the inquire. I've searched through my files and find absolutely nothing. So, if any of you are familiar with this aircraft, let the editor know, and if the individual who requested the information will send me a letter bomb, it may just get my attention, and I'll forward the data.

TOM SCHMITT HAS brought to our attention that the MAXECUTERS have been very fortunate over a period of years to enjoy the talents and generosity of its members in supplying many fine trophies and prizes. We have recently purchased a set of "Golden Age" peanut plans from Emmanuel Fillon to use as contest prizes. These plans are recommended to those of you who wish to build something different from excellent plans. A partial list is given below, and prices are very reasonable.

NOUVEAUTE: Serie Special sur le theme: Avions Civils Francais des 1930"s

Monoplans	[Salmson D6 Cricri	Biplans	[Hanroit 431
Parasols	[Potez 60 Sauterelle		[Biplan Volland V 10
	[Morane 341		[Caudron Luciole
	[Hanroit 160		[Leopold Colibri
Monoplans	[Potez 38	Sesquiplans	[Hanriot 180
Cabine	[Potez 58	Cabine	[Atalante GB 10
	[Caudron 410 Phalene	Monoplans	[Caudron Aialon
	[Farman 400-404	Aile Basse	[Mauboussin Corsaire
	[Salmson D5	Monoplans	[Petit Brochet
Tandem	[Peyret Taupin SFA		[Morane 350

1 Plan.....\$ 1.25
Set of 20 plans.....\$17.00

Postage for Air Mail printed matter is,

1 to 8 plans.....\$ 1.00
9 to 15 plans.....\$ 1.50
16 to 22 plans.....\$ 2.00

Monsieur Fillon accepts checks. We suggest a little extra be sent because the exchange rate has varied since the above prices were set. His address is:

Monsieur Emmanuel Fillon
60 Rue du Bocage
83700 St. Raphael
France

YOUR EDITOR HAS a collection of old model magazines that he will sell at VERY reasonable prices. Most of the issues are from the 40's, 50's, and 60's. A few are 1930 vintage. Send a self addressed stamped envelope to the editor for details and a listing of available mags.

THIS ISSUE HAS a relatively large selection of plans for your spring building efforts. Our feature plan (ANOTHER full size fold-out) is a Stampe by John Low. Also included is a set of outlines for a 16 inch Spitfire that can be used to build a NO-CAL for the June commemorative event. You will also find an interesting twin pusher by Bud Carson and Part 5 of the series "IS A HORIZONTAL TAIL NECESSARY". Another WINGED WORDS crossword puzzle by Dave Stott should keep you folks busy for a few hours. Finally, we have two more fantastic photo pages that you all appreciate so much, compliments of the efforts by Tom Schmitt.

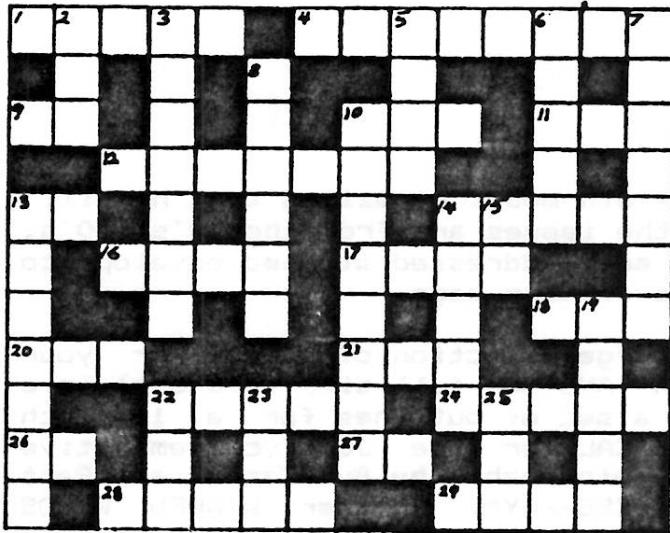
PHOTO PAGES

TOM SCHMITT

1. Our featured plan of this issue, a nifty Stampe by John Low from up in Rochester. Photo by John.
2. A full size Stampe for the detail seekers. MAX-FAX will reward the 4 th person beyond 200 miles who identifies the dashing airman with a free one year extension to his membership.
3. Bruce Price receives his award from our "99 er", Ada M. Garrett, at the fall Fax River contest. Come on down and join the fun on March 8.
4. Paul Spreiregen and his latest, a good flying Puss Moth.
5. John Koptonak, a visiting FAC'er from "Pinkham Field", with his Demoiselle.
6. John's wife Jackie came along to lend a helping hand. They expect to be in the area about a year.

7. Our editor gets ready to launch his helicopter made from Bill Hannan plans.
8. Another whirly-bird, this time an autogyro by Doug Buchanan, who has had trouble getting it to fly.
9. Bill Clarke with his twin motor Bostonian.
10. An unusual No-Cal Henschel P-75 by Glen Simpers.
11. Bob Clemens launching his Curtiss No-Cal.
12. Bob Thompson and his high flying Stuka at last summers' FAC event in Chicopee.
13. Hurst Bowers tempts Bert Phillips with a select morsel from a buffet of "ready to be repaired" Cleveland model originals. Cagy Bert keeps hands in pocket.
14. A photo from Bill Hannan showing two Brown engines about a half century apart.
15. Once upon a time we had a member named Dudley Prisel, who always turned up with great models such as this Golden Age Seversky. Perhaps he'll crawl out of the thriving metropolis of Waldorf MD on March 8, since Pax River is about two hoots, a holler, and a nine iron shot from his back yard.
16. Bert Phillips with his Art Chester Goon.
17. Emmanuel Fillon, master craftsman, with his Hawker. See note about his plans in this issue.

WINGED WORDS by Dave Stott



ACROSS

1. French plane manufacturer
4. German engine
9. Leading edge (abr)
10. Nose
11. Model mag (abr)
12. Small radial engine
13. Model mag (abr)
14. _____ Hawker
16. _____ Guru
17. Maneuver you can eat
18. _____ Sopwith
20. What many states put on gassies in 1936
21. Jim's wife
22. Where some modellers work
24. Northrop _____
26. Major Rufus Garrity was one _____
27. _____ Flier Kites
28. Mic job's enemy
29. San Diego School of Aeronautics

DOWN

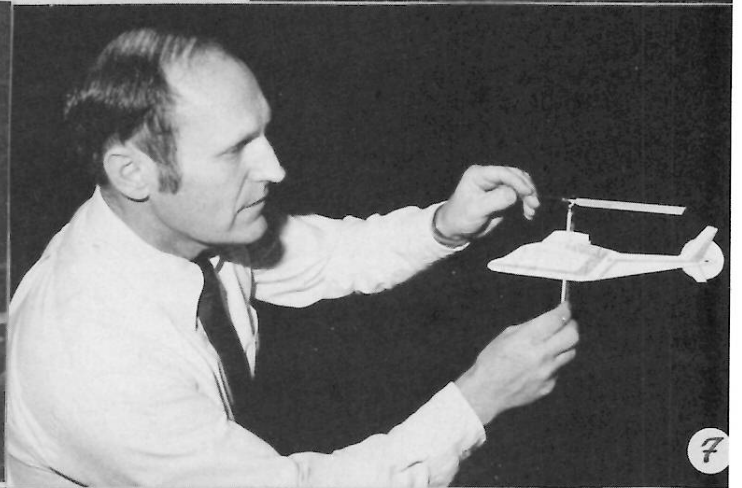
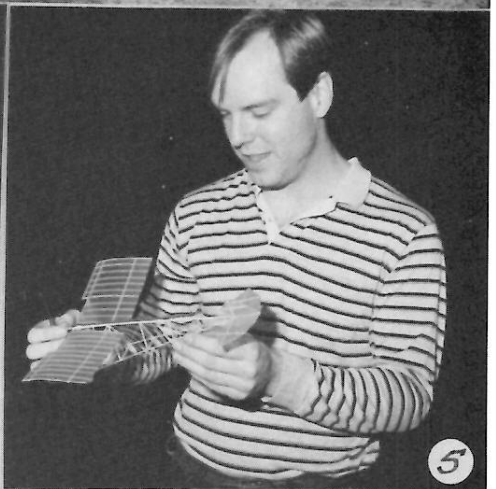
2. _____ Pahlin, prop maker
3. Engine in 1936 Thompson winner
5. Modeler's enemy
6. Name of ships by both Hawker and Curtiss Wright
7. British aero engine
8. Wing curve
10. German designer of angular planes
13. Zepp engine
14. WW I Austro-Hungarian plane maker
15. _____ Williams
19. How we'd all like to fly
24. Model's medium
23. Avenger
25. First ship deck take-off

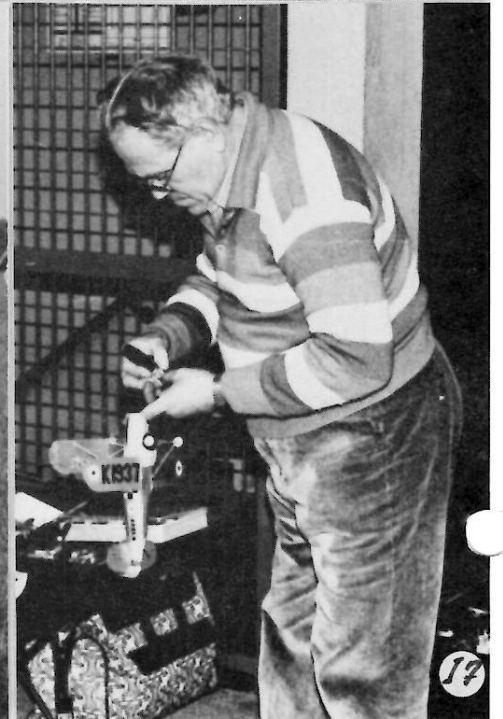
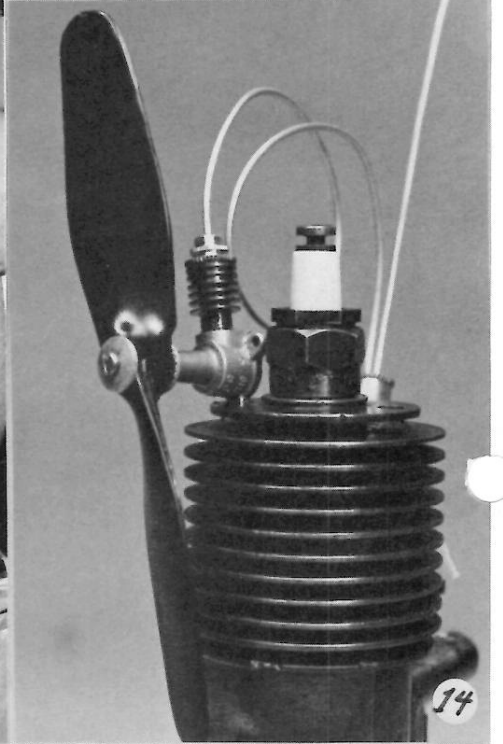
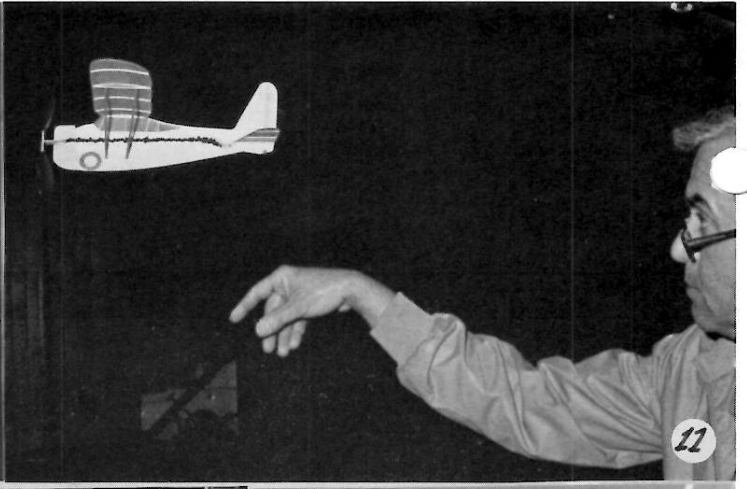
BOSTONIAN CONTEST - 11 JANUARY 1986
NORTHWOOD HIGH SCHOOL

NAME	AIRCRAFT	FLIGHT TIMES-SECS					BEST 2 FLIGHTS	PLACE
		1	2	3	4	5		
DAN DRISCOLL	OBSERVER	17	21	21	-	-	42	8
BOB CARSON	BOSTON BISON	50	45	-	-	-	95	3
BERT PHILLIPS	BOX	27	37	27	44	45	89	4
DOUG BUCHANAN	BOGS BUCHANAN	25	28	28	18	-	66	5
RANDY KLEINERT	GREAT EXPECT.	48	78	51	52	51	104	2
BILL BELL	ROUND	25	20	21	19	-	46	7
BILL COARAE	FERDODY PROBT	21	37	-	-	-	58	6
TOM SCHMITT	HARVARD SPY	54	55	54	59	43	114	1

NO-CAL CONTEST - 25 JANUARY 1986
NORTHWOOD HIGH SCHOOL

NAME	AIRCRAFT	FLIGHT TIMES-SECS					PLACE
		1	2	3	4	5	
RANDY KLEINERT	CHAMBERLAIN	122	104	92	318	4	
BOB CARSON	FOOSEL	117	114	122	353	2	
PAUL GREGORY	FHC	102	95	55	232	7	
PAUL SPARTAN	FAW BIRD 2F	51	-	-	51	8	
RICH HENSEL	OUJ	143	94	117	354	1	
GLEN SIMPERS	HENSCHEL P75	92	83	83	258	5	
ALAN JOHNSON	AUGUSTA HELO	15	-	-	15	9	
TOM SCHMITT	STEL-1	87	67	80	234	6	
BOB SKULL	STLER	100	125	111	326	3	





IS A HORIZONTAL TAIL NECESSARY?

TAILLESS

Part 5

By George B. Collinge
(EAA 67, Lifetime)
5037 Marlin Way
Oxnard, CA 93030

Illustrations by the Author

ARE "TAILLESS" AIRPLANES really tailless?

By utilizing fixed wings for lift, manually-controlled stable flight is most difficult if not impossible without a tail (ref. 1). Nevertheless the primary inclination of designers of all-wing aircraft has been to increase efficiency by eradicating the fuselage and tail as non-essential drag and weight-producing appendages. The "all-wing" purists favor the concept that the wing itself should contain everything the airplane has to carry.

Although eighty years and millions of airplanes has resulted in the conventional tail-at-the-rear formula, aviation history records many efforts to do it differently. But however it is disguised or camouflaged, the tail or rather the tail-substitute, is always there someplace, in some form or shape.

A positively-cambered airfoil when used inverted, or a sufficiently reflexed (bent up) airfoil tend to inhibit cp travel or even reverse its movement so that its effect is to resist any change in angle of attack thus providing a degree of stability. The rear portions of these sections act as negatively-angled tails, the forward parts as conventional wings.

Tailless wings usually have a large amount of twist in order that the outer areas (routinely swept at least slightly) can act as a tail although like the reflexed airfoils, they function with minimal leverage. And because of their limited power, the range of CG travel that they control must also be severely restricted, if not immovable.

Unfortunately, wings of this kind plainly create less CL than "unstable" wings. To carry the same load more wing area is needed. This and the impossibility of effectively using high-lift trailing-edge flaps (because of the aft cp shift) defeats much of the original rationale of the all-wing airplane. It quickly becomes apparent that any claimed advantage of the type is sharply compromised.

All-wing aircraft have at times been fitted with trailing-edge flaps that go down but at the same time have an equal area go up. This is to average out the median line and maintain balance. About the only result is drag, though quite a useful and on occasion a most desirable force.

Within their small operating envelopes, all-wing aircraft can add to their already necessarily stable characteristics by incorporating springs and/or weights in the elevator control-system. As with a conventional airplane, by limiting control-surface travel, an all-wing airplane can also be made to resist stalling and spinning at low speeds, even when the stick is fully aft, which capability seems to be a penchant of a fair percentage of designers (ref. 2).

There will always be dreamers with a favorite or pet formula in spite of the realization that their ideals may harbor innate flaws. It can be surprising to note the tremendous human endeavour that has been expended, in cases, in efforts to bring such ideas to successful fruition.

Case in point, the Mel63 (ref. 3 to 10). Beset by inherent tailless problems, the liquid-rocket motor, with all

its then terrible propensities was employed by Alexander Lippisch in his passion to see his brainchild accepted as what else, a superior airplane. But that was not to be, although a number of Komets did become operational. It had the usual features of a single-wing, moderate aspect-ratio aircraft. The 23.3 degrees of sweep was a concession, not to boost the critical mach number, rather to allow a rearward displacement of the ailerons where they could do double duty providing control in pitch.

A large amount of twist was necessary to provide sufficient longitudinal dihedral (Fig. 5-1). The landing flaps, referred to in German literature as brakes or dive flaps, were positioned in a mid-chord location, to minimize the resultant aft cp movement.

Other all-wing aircraft have used the same flap location, and also just for drag. The Mel63 flaps could only have been intended for drag because they gave a CL increase of barely 0.1 and this is not subtracting the CL loss due to up-travel trimmers.

It may be worth noting that the effect in pitch of Komet's flaps was one-third down-nose slightly up. From two-thirds down-nose lowered, requiring "tail-heavy trim".

With the positions of the cp and CG pretty well fixed, only leading-edge slats were permissible without problems. They increase the usable angle of attack but do not cause significant cp movement.

Enabled by wartime German decision-system which was essentially controlled by political people, the Mel63 "proved" the concept, sort of. A

total of 360 were built in Germany (ref. 10) and 7 in Japan (ref. 11).

Other than this one decreed adaption, there could be no real useful work for the tailless. One good thing about the Me163 was what it spawned. It is obvious that Lippisch was finally convinced of the all-wing dead end and in May 1943 he left Germany to do new design work in Vienna.

When the wings of a tailless design are swept sufficiently to provide really useful longitudinal dihedral plus a means of ensuring an adequate lever-arm for the elevators, closing in of the space between the arms of the wing was natural and inevitable and resulted in the delta as is known today. Besides structural advantages and a large increase of internal volume, it is an unchallenged fact that the narrow-angle delta planform has ideal aerodynamic characteristics for certain high-speed aircraft while at the same time is capable of great lift at low speeds, without the use of flaps which it, like the all-wing cannot use anyway. The large factor of induced drag at the controllable high-angles of attack well substitutes for flaps in the desirable steepening of the approach, in the lowering of landing speeds and practically eliminating any semblance of unwanted float.

When the elevons of the delta are raised for the flare, the entire airplane rotates through its inertia

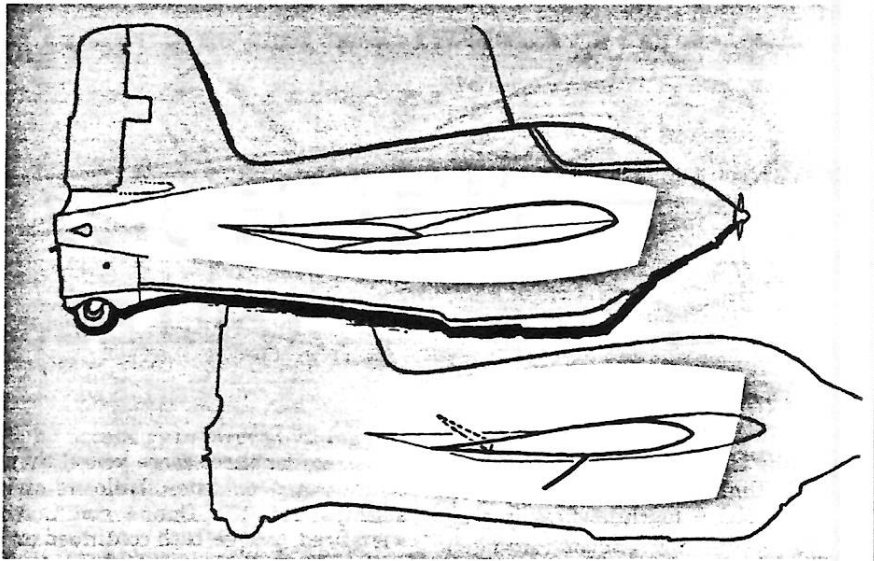


Fig. 5-1 Me 163 1942.

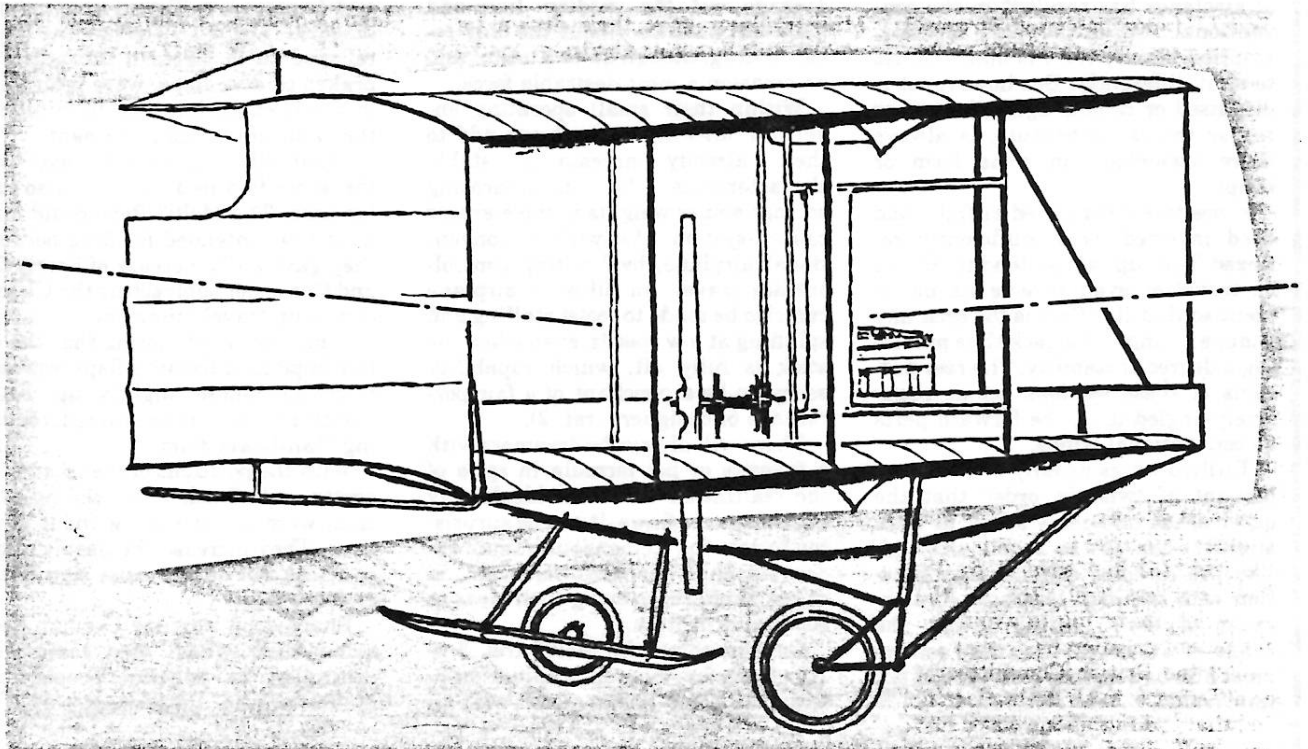
keeps it momentarily going straight ahead. Thus the huge and instantaneous increase in CL, coupled with a tremendous ground effect, put the delta on gently, the aerodynamic drag slowing it automatically until the nose wheel is lowered onto the runway.

Upon examining history, it becomes clear that the revolutionary Me163 was not so revolutionary after all. Because, back in the early days, a man named John William Dunne

had invented the swept and twisted wing, to be flown without a separate tailplane. He had begun his experiments in 1904, through monoplane to triplane, his biplanes being the best known.

Dunne, along with Samuel Franklin Cody in 1906, were employees of the Royal Aircraft Establishment, Balloon Factory, at Farnborough. Both these men (among others) were trying to be the first to

Fig. 5-2 Dunne d-5 1910.



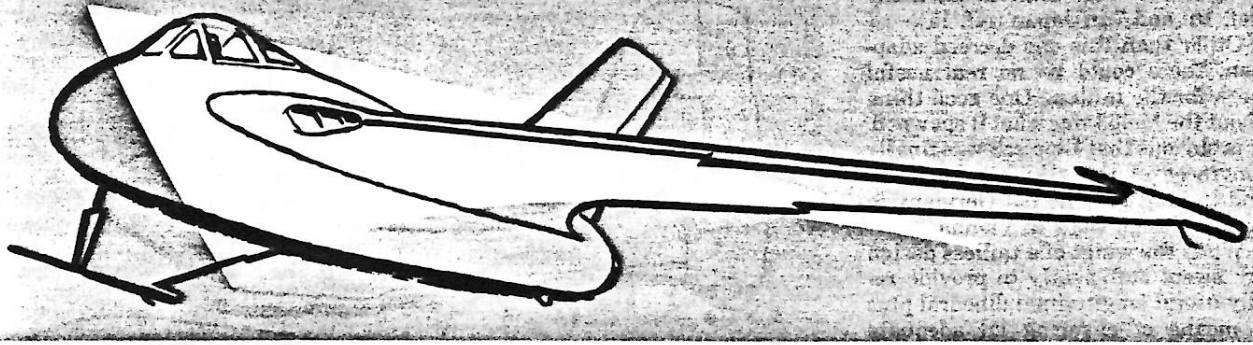


Fig. 5-3 Swallow 1946.

fly in the UK. Cody succeeded in sustained flight on Oct. 16, 1908; Dunne's No. 5 machine flew in the spring of 1910.

The Wrights were still using a forward elevator and their airplanes were not stable. In fact, at this time they stated that inherent stability was undesirable. Their system was for "hand-controlled equilibrium". Dunne had made his own calculations based on the Zanon seed well before stability and control had been "clarified" by such as Lanchester (ref. 12).

The Wright type front-elevator design greatly influenced beginning aviation, including Cody. Not so Dunne. He felt that airplanes should be definitely stable. Not that they should be able to fly without a pilot, but instead not require hectic, constant attention to pitch control as did the Wright types. He tried forward control-surfaces on one of his early gliders, for more nose-up control during landings. It was discarded, larger rear elevators worked better (ref. 13).

A typical Dunne airplane, his first really successful flyer, the D.5 (Fig. 5-2) was a single-engine, twin-propeller biplane with a 52 degree sweep and a pronounced twist. This powerful longitudinal dihedral gave the pilot a firm and steady airplane. His "horizontal rudders", as they were called then, were flaps at the wing tips which on his D.4 were actuated by a "modern" wheel on a column, the wheel for roll and push/pull for pitch, the original elevons! (Ref. 14) Dunne aircraft had fixed fins but no rudders. At least one of his machines was built under franchise by Nieuport in France (ref. 15) and several by W. Starling Burgess (ref. 16) in the U.S.A., who was trying to avoid the Wright patent on ailerons.

In 1909 the British Committee of Imperial Defence, in all their wisdom, decided that the Aeroplane was a lost

cause, so (for three more years) they concentrated on kites, balloons and airships (ref. 17). Dunne and Cody were fired, though both continued experiments on their own.

This seemingly congenital urge of English politicians to terminate the airplane by fiat made one of its appearances in 1965 with the scuttling of a number of projects, notably the TsR2. An all-missile or remotely-controlled air force was to be the wave of the future (ref. 18) and this, sadly, from a country that has contributed a good share of the world's finest flying machines.

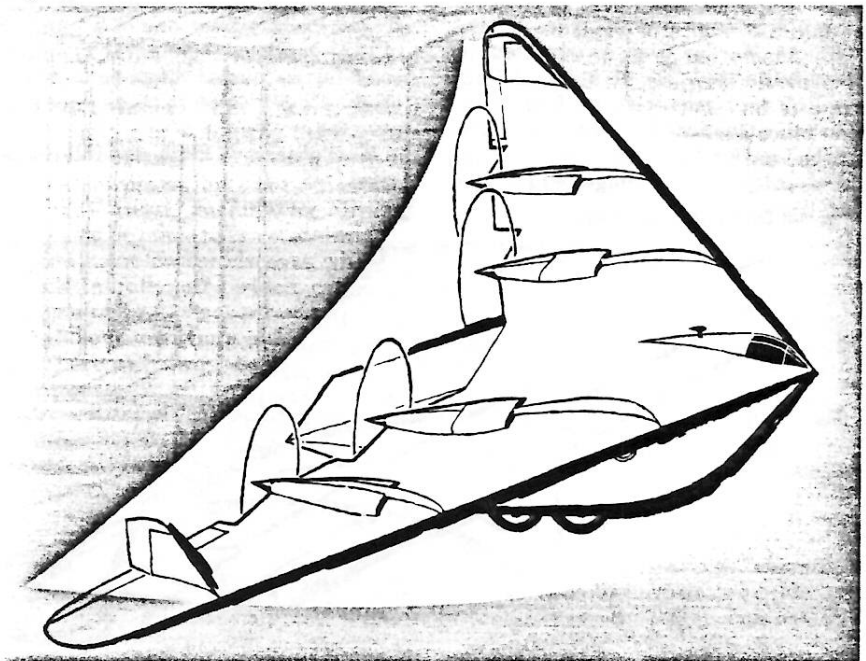
Back to WW-II. A group headed by the Horten brothers, Reimar and Walter, convinced the German Air Ministry that they, too, should be supported for their own particular brand of tailless. As the Hortens could not provide sufficient production facilities, the Ministry later gave their design to

Gotha (ref. 19). Not surprisingly, little was accomplished.

In 1945, the British Ministry of Supply sponsored a program of tailless research (ref. 20) which resulted in a number of experiments. On March 15, 1946 the first flight took place of a single-seat DeHavilland 108 Swallow (Fig. 5-3), one of three to be built (ref. 21). A few months later, DeHavilland announced the Swallow as an "... experimental basis for later types" (ref. 22) and the upcoming Brabazon 1V transport (Comet) in particular. A 1946 full-page ad in Flight showed an artist's rendering of a proposed all-wing airliner (ref. 23). On Sept. 27, the number two DH108 disintegrated in the air with no escape for the test pilot Geoffrey Raoul DeHavilland, (ref. 24). There were no more Swallows built and no all-wing airliner.

John Knudsen Northrop was an

Fig. 5-4 IA-38 1960.



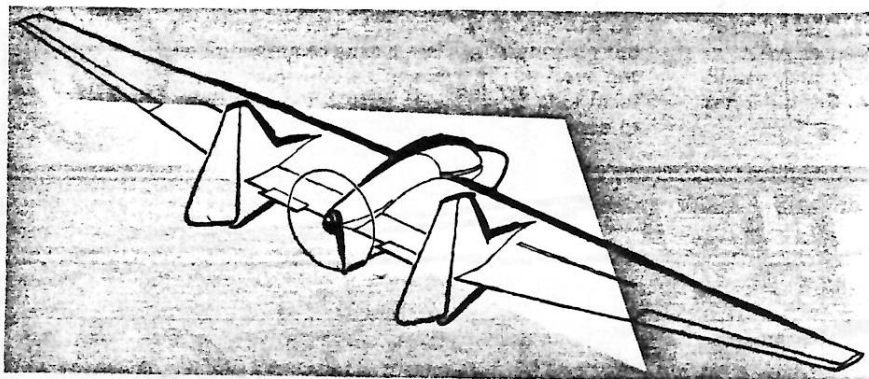


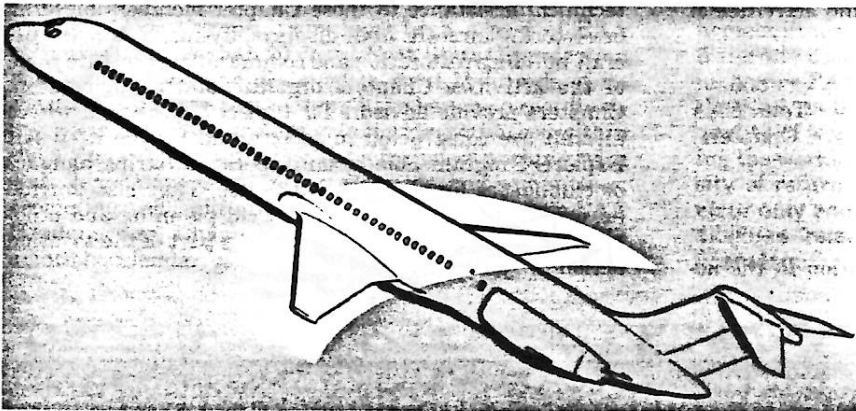
Fig. 5-5 Fauvel AV-45 1960.

American "tailless" zealot and was responsible for a bevy of aircraft of this kind (ref. 25) including the B-35 and YB-49. He, too, could never make his wings thick enough to get everything inside, there were bumps, pods, blisters and engines all over. Up to the last, the problem of trying to devise suitable high-lift devices eluded Northrop although he always claimed they were under study (ref. 26).

His Flying-Wing bomber prototype was being flown over the Air Force flight test center at Muroc, California on June 5, 1948. During a stall series the airplane began such violent somersaulting that the resultant strain separated some of the structure and it crashed and exploded with the entire crew onboard. The contract for thirty YRB-49 aircraft was immediately cancelled and the remaining Flying Wings were scrapped. The Air Force went with the B-36. Muroc was renamed in honor of the dead pilot, Captain Glen Walter Edwards (ref. 27).

An Instituto Aerotecnico type 38 cargo transport was designed by Dr. Reimar Horten and constructed in Argentina (ref. 28). It suffered from cooling problems with its four semi-buried, extended-shaft air-cooled 450 hp El Gaucho radial engines. Its relatively high-drag fuselage, which was

Fig. 5-6 DC9 Super 80 1982.



found necessary to carry anything the least bulky, again calls attention to the obvious futility of trying to make the all-wing concept a practical carrier (ref. 29). Not helping in his regard was a massive retractable nose-wheel, pivoted under the pilot's cockpit. It took up much of the fuselage interior space. The 1A-38 made a flight on Dec. 9, 1960 (Fig.5-4).

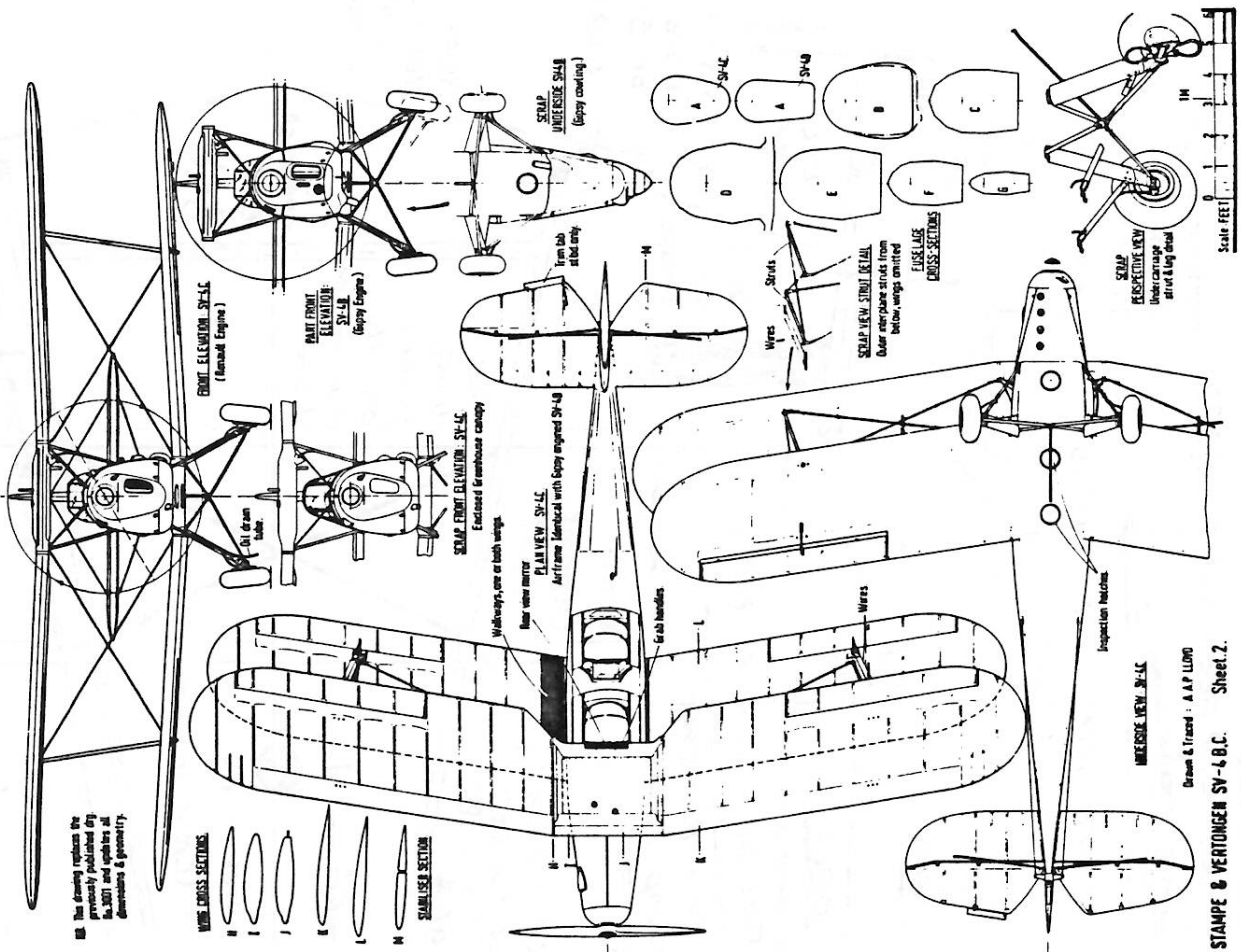
For the last few decades, no large aircraft concern has been really serious about the classic all-wing aircraft. However, individuals have produced some examples (Fig. 5-5). These have been and are mostly single placers with restricted activity and little tolerance for variation of CG position. All have some accommodation to accepted flying techniques.

The goal of putting everything inside a wing has proved illusive, nullifying the touted advantage of the tailless concept. In fact, modern transports evidence just the opposite end, where relatively tiny and thin wings support ever-larger fuselages. The sketch of the DC-9 (Fig. 5-6) has been traced exactly from one of a number of well-publicized photographs and so contains no biased distortions which might otherwise serve to enhance this premise.

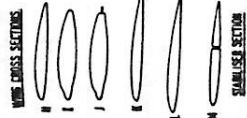
Next month — Pitch and roll retro-spect.

References:

1. Aerodynamics of the Airplane by Clark B. Millikan, General Publishing Co. Limited, Toronto 1941, page 142.
2. Homebuilt Aircraft, Werner and Werner Corporation, Santa Monica, 198, page 8.
3. Rocket Fighter by John T. Dodson, Flying, Jan. 1950.
4. Developing a Rocket Fighter by Rudolph Opitz and Robert Randell Air International, UK, Vol. 21, 1965.
5. Wings of the Luftwaffe by Capt. Eric Brown, Doubleday & Co., Inc., USA 1978, pages 167 to 176.
6. The Komet by William Green, RAF Flying Review, UK, Vol. 18, No. 8, April 1963.
7. Raketjager Me163 by Mano Ziegler, Motor Press Verlag, Stuttgart, WG, 1961.
8. Ein Dreick Fliegt, The Delta Wing by Alexander Lippisch, Motorbuch Verlag, Stuttgart, WG, 1976.
9. Das Buch der Duetschen Luftfahrttechnik by Bruno Lage, Verlag Dieter Hoffman, Mainz, WG, 1970, pages 552,553.
10. The Aeroplane Spotter, March 6, 1948, page 58.
11. The Aeroplane Spotter, April 3, 1948, page 82.
12. Early Aviation (at Farnborough) by Percy Walker, MacDonald & Co., Ltd., London 1974, pages 169, 171.
13. Early Aviation (at Farnborough) by Percy Walker, MacDonald & Co., Ltd. London 1974, page 231.
14. Earl Aviation (at Farnborough) by Perry Walker, MacDonald & Co., Ltd., London 1974, page 185.
15. Aviation Magazine, Paris, June 1959, page 28.
16. Flight, Jan. 3, 1930, page 41 and Dec. 11, 1953, page 755; Contact! by Henry S. Villard, Crown Publishers, Inc., NY 1968, pages 166, 167, 238.
17. Early Aviation (at Farnborough) by Percy Walker, MacDonald & Co., Ltd., London 1974, page 327.
18. Project Cancelled by Dereck Wood, The Bobbs-Merrill Company, Ind., Indianapolis 1965.
19. Nazi Jet-Bats Which Never Took Wing by Erwin J. Bulban, Aviation USA, Oct 1945.
20. Aviation Week, Sept. 15, 1952, page 21.
21. Inter-Avia, Vol. 4, Oct. 1949, page 610.
22. Flight, June 6, 1946, page 562.
23. Flight, Nov. 7, 1946, page v.
24. Flight, Oct. 3, 1946, pages 364, 365; Aeroplane, Oct. 4, 1946, pages 380, 395.
25. Northrop Activities, Flight, May 9, 1946, pages 469, 470.
26. The Northrop "All-Wing" Airplane by John K. Northrop, Aviation USA, Dec. 1941; All-Wing Aircraft by John K. Northrop, Flight, June 55 and 12, 1947.
27. Model Airplane News, June 1963.
28. Air Pictorial, Air League of the British Empire, London, July 1961, page 193; Jane's Encyclopedia of Aviation, Vol. 3, Grolier Educational Corporation, Danbury USA 1980, page 478.
29. Tailless Problems by G. H. Lee, RAes paper, Nov. 14, 1946, Flight, Nov. 28, 1946; Stalling Phenomena and the Tailless Aeroplane by A. R. Weyl, series, Flight 1947.



18. This drawing replaces the previously published fig. No. 3017 and updates all dimensions & geometry.



FRONT ELEVATION SV-1C
(Renault Engine)

PART FRONT ELEVATION SV-1A
(Gipsy Engine)

TOP VIEW SV-1B
From tab at the end

REAR VIEW SV-1F
SEMAP UNDERSIDE SKIN (Gipsy covering)

FRONT ELEVATION SV-1E
Enriched fuselage canopy

PLAN VIEW SV-1C
Airframe identical with Gipsy engined SV-4B

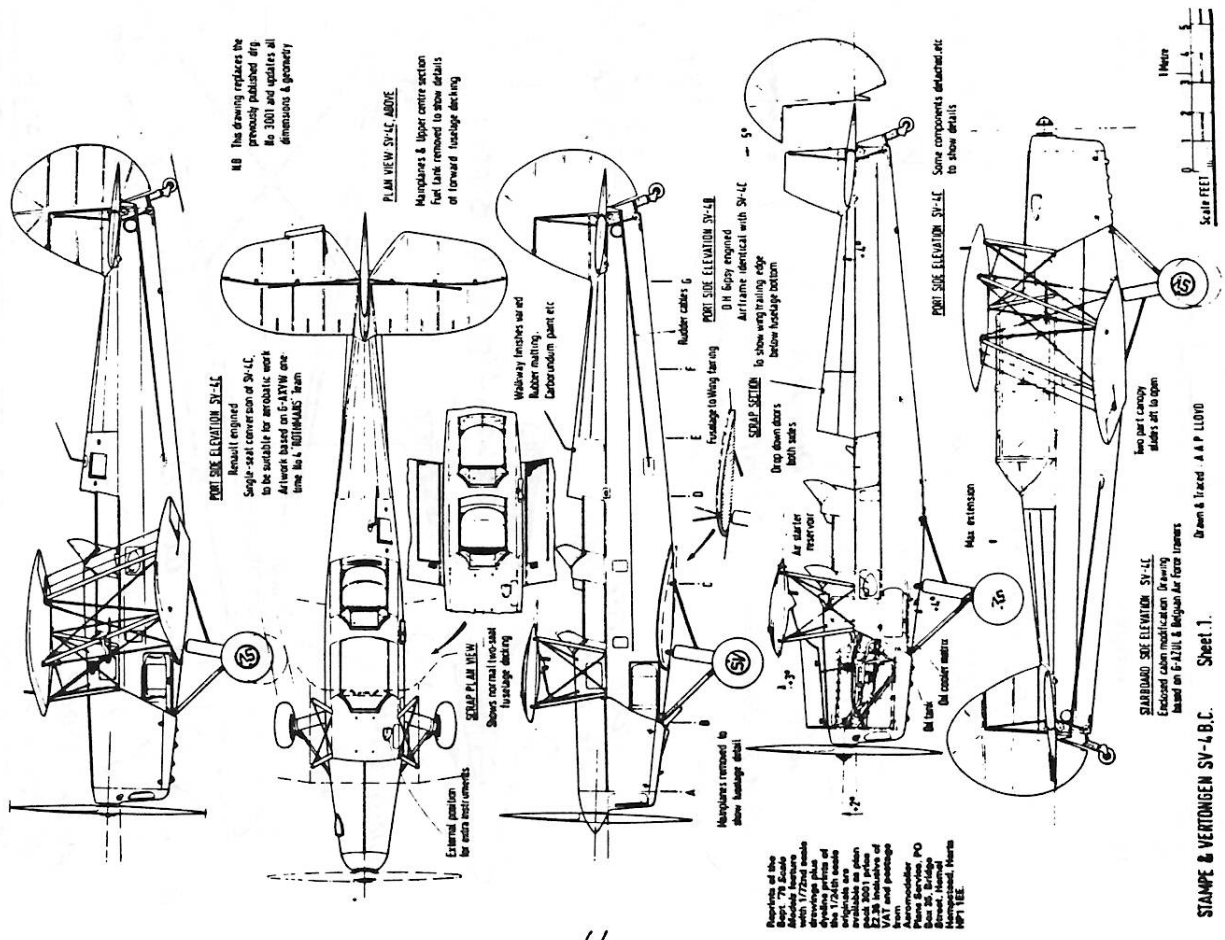
REAR VIEW SV-1G
Wings, one on both wings

REAR VIEW SV-1H
New wing motor

REAR VIEW SV-1I
Airframe identical with Gipsy engined SV-4B

UNDERSIDE VIEW SV-1C
Inspection holes

Drawn & Traced - A.A.P. LUDLO
STAMPE & VERTONGEN SV-4B.C. Sheet 2.



18. This drawing replaces the previously published fig. No. 3017 and updates all dimensions & geometry.

PLAN VIEW SV-1C, ABOVE
Main spar & upper centre section fuel tank removed to show details of forward fuselage decking

PORT SIDE ELEVATION SV-1C
Renault engined
Single-seat conversion of SV-1C to be suitable for aerobatic work. Aircraft based on F-47/39 one time No. 4, 'BOUTHAUX' team.

SHORT PLAN VIEW
Shows correct fuselage fuselage decking

WINGWAY FINISHES USED
Rubber mulling,
Carbonium paint etc.

PORT SIDE ELEVATION SV-1E
B.H. Gipsy engined
Airframe identical with SV-1C - 5°

SEMAP SECTION to show wing trailing edge below fuselage bottom

REAR VIEW SV-1F to show wing trailing edge both sides

REAR VIEW SV-1G to show wing trailing edge

REAR VIEW SV-1H to show wing trailing edge

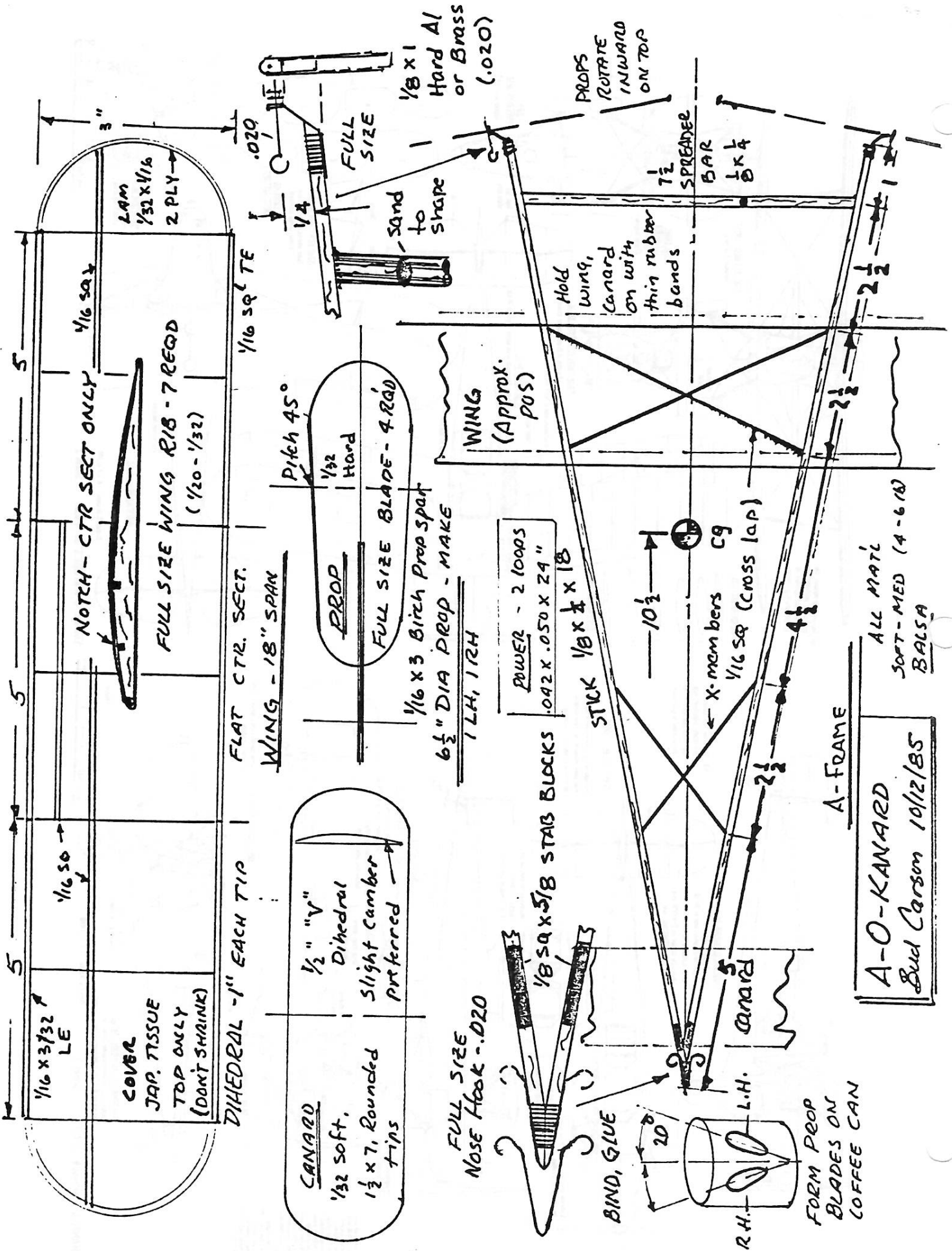
STARBOARD SIDE ELEVATION SV-1C
Enriched cabin modification. Aircraft based on F-47/39 & Belgian Air force trainers.

REAR VIEW SV-1I
Two part canopy slides off to open

Drawn & Traced - A.A.P. LUDLO

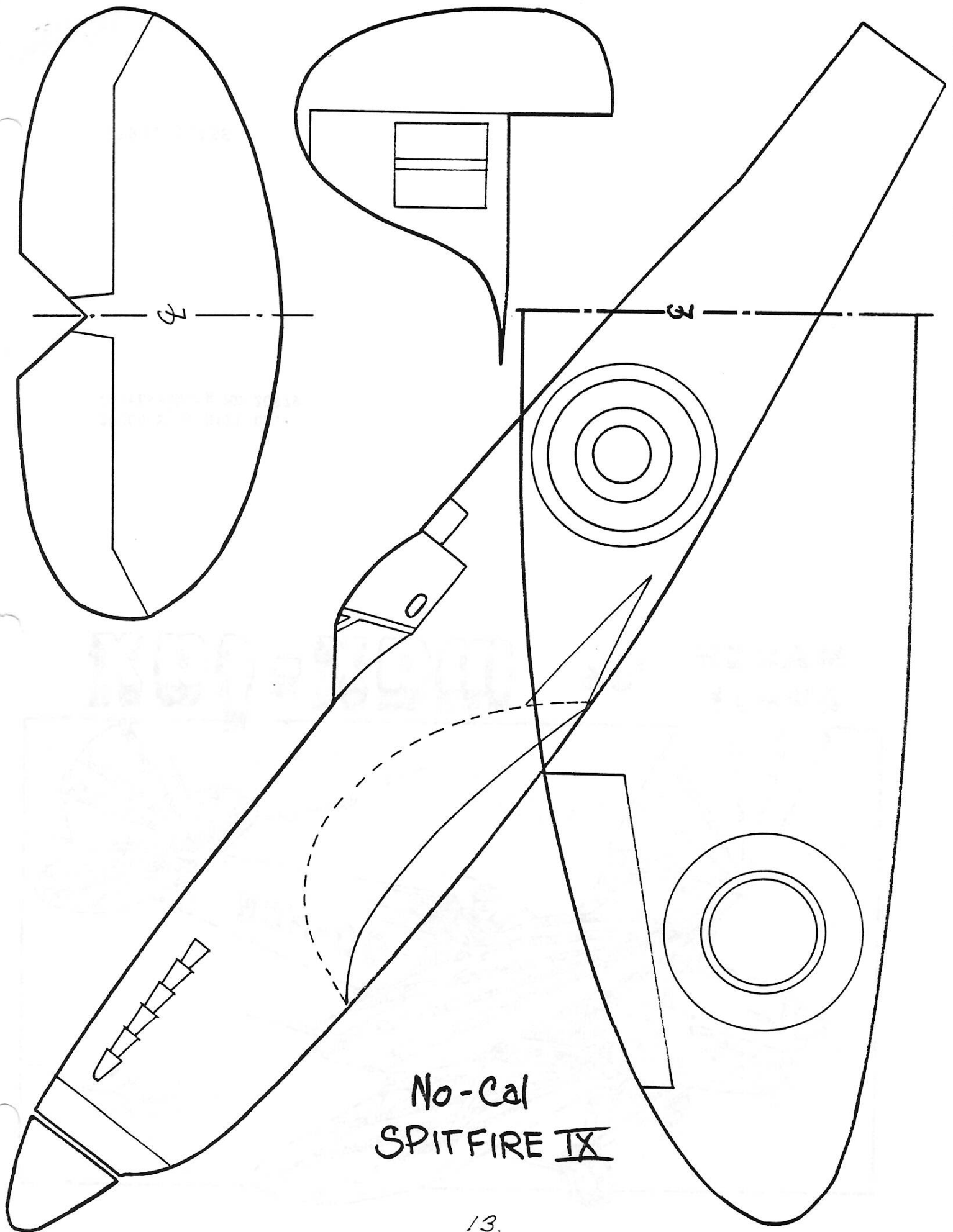
STAMPE & VERTONGEN SV-4B.C. Sheet 1.

Reprints of the Stampe & Vertongen SV-4B.C. with 1772nd issue of the drawing profile of the 1774th issue available in plain form. 3001 price. VAT and postage from: Stampe & Vertongen, PO Box 31, Bridge Street, Humpstead, Herts HP1 1EE.



A-O-KANARD
Bud Carson 10/12/85

A-FRAME
ALL MAT'L
SOFT-MED (4-6 LB)
BALSA



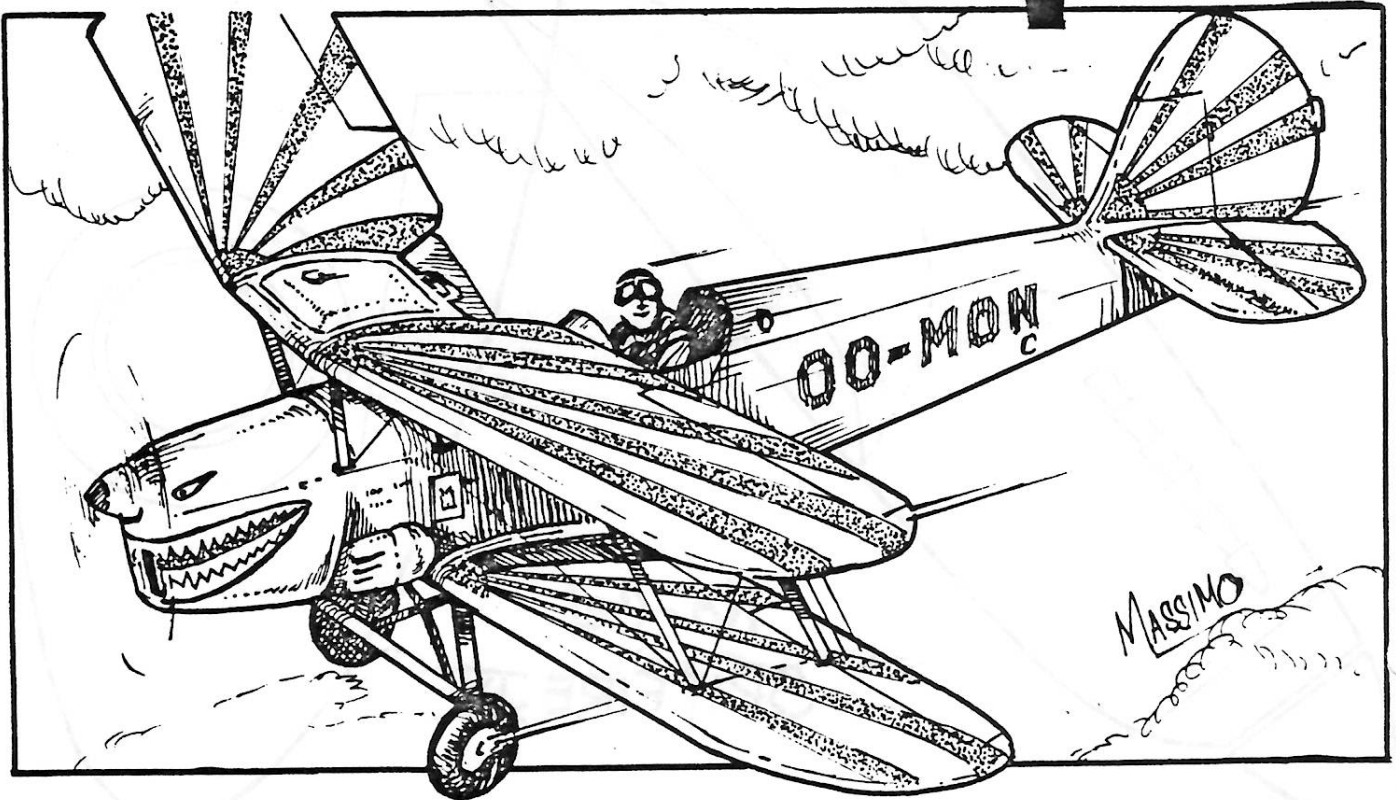
No-Cal
SPITFIRE IX

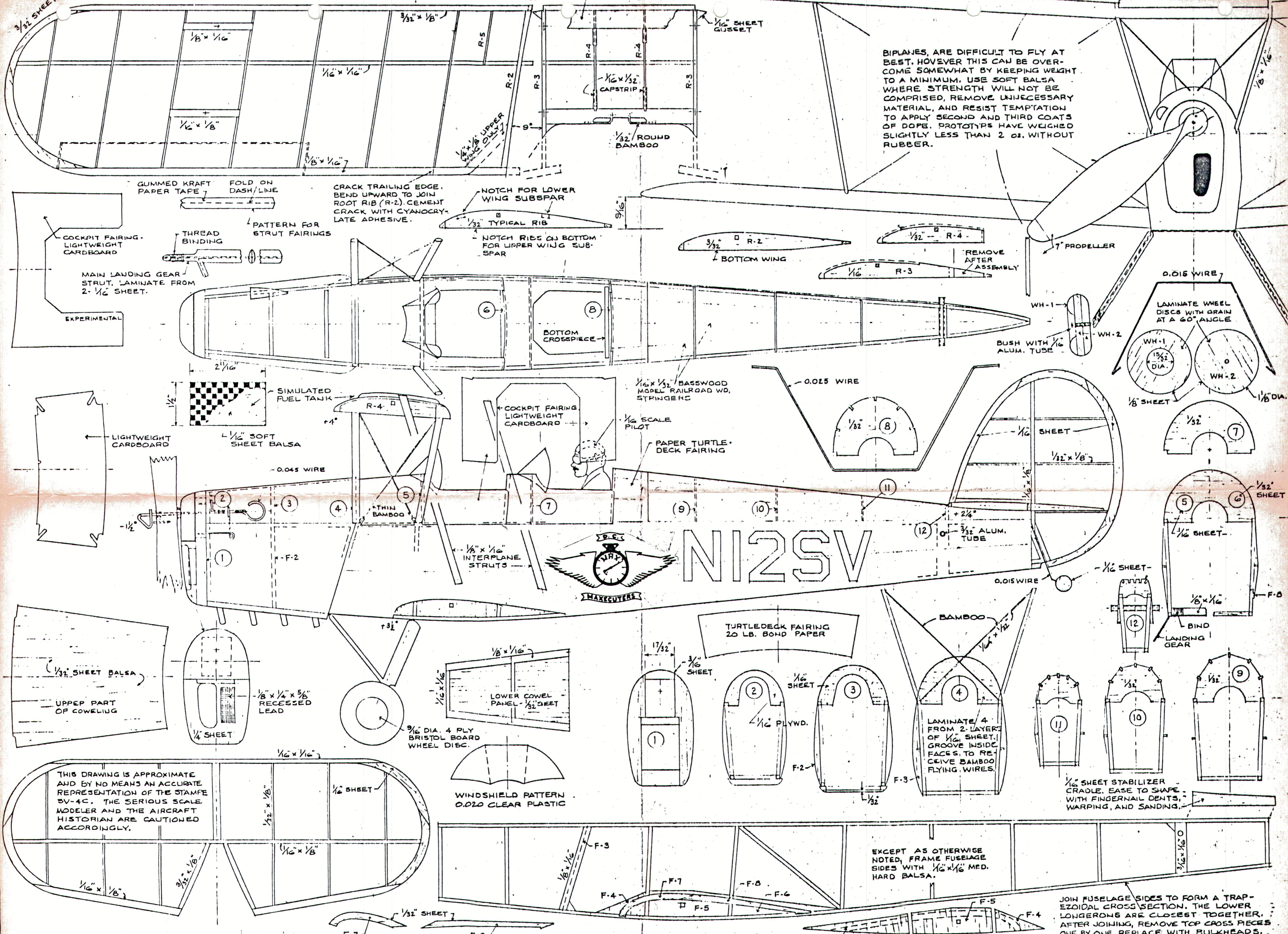
FIRST CLASS

2008 Spur Hill Dr.
Gathersburg MD 20879

MARCH
APRIL '86

max-fax





BIPLANES, ARE DIFFICULT TO FLY AT BEST. HOWEVER THIS CAN BE OVERCOME SOMEWHAT BY KEEPING WEIGHT TO A MINIMUM. USE SOFT BALSA WHERE STRENGTH WILL NOT BE COMPRISED, REMOVE UNNECESSARY MATERIAL, AND RESIST TEMPTATION TO APPLY SECOND AND THIRD COATS OF DOPE. PROTOTYPES HAVE WEIGHED SLIGHTLY LESS THAN 2 OZ. WITHOUT RUBBER.

N125V



THIS DRAWING IS APPROXIMATE AND BY NO MEANS AN ACCURATE REPRESENTATION OF THE STAMPE SV-4C. THE SERIOUS SCALE MODELER AND THE AIRCRAFT HISTORIAN ARE CAUTIONED ACCORDINGLY.

EXCEPT AS OTHERWISE NOTED, FRAME FUSELAGE SIDES WITH 1/16" x 1/16" MED. HARD BALSA.

JOIN FUSELAGE SIDES TO FORM A TRAPEZOIDAL CROSS SECTION. THE LOWER LONGERONS ARE CLOSEST TOGETHER. AFTER JOINING, REMOVE TOP CROSS PICES ONE BY ONE, REPLACE WITH BULKHEADS.