JAN 1976

D.C. MAX MAXECUTERS

The next meeting of the D.C. Maxecuters will be

Wednesday, Jan 7, 1975
College Park Airport
7:00 P.M.

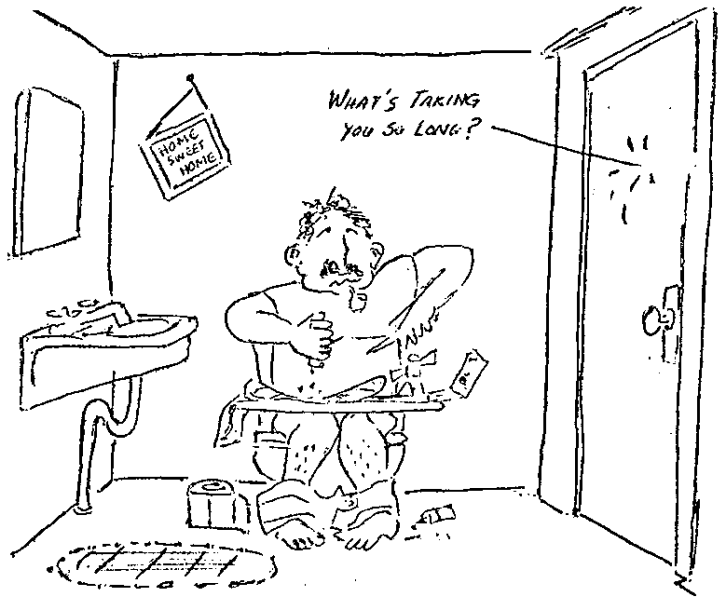
THOUGHTS FROM "THE ALLAN"

The way I see it, "JOHNS" have been given the honor (??) of being associated with "the throne" long enough. Exclusive associations are monopolistic, and we all know the government's Office of Equal Opportunity says that's a NO-NO. Consequently, the 'ole HMFIC has taken it upon himself to change this exclusive association between "JOHNS" and "JOHNS". For the remainder of this year, your newsletter will include a section entitled, THOUGHTS FROM THE "ALLAN", an acronym for Anti Latrine Language Association.

So much for the introductory remarks. Let's get down to business. For those of you who have been offended by previous Newsletters, let it be known that my first New Year's resolution will be to clean up the language used in this dammed, er,... darned newsletter. What follows will be some pearls of wisdom, trivia, grafitti, and flashes of genius written in the seclusion of the "Potty". Indeed, we'll try to turn these otherwise unproductive hours into a literary extravaganza of brilliant potty perversion. The secluded joy of relieving one's self becomes a creative trip into the world of artistic expression. Once a month, you will be treated to those personal thoughts about miniature aircraft that can only come from such exclusive solitude.

THOUGHT #1: How the Hell do you make a paper airplane out of this "crappy" paper rolled up on the wall. The lack of internal rigidity dictates gliders with anhedral, regardless of orientation. Maybe an ornithopter would be appropriate considering the building materials available at the moment. A Rogalla wing also has possibilities. And regardless of your design, fishing around for that inevitable nose weight oughta be something else. Perhaps that cardboard tube at the center of our tissue supply might make an appropriate winding tube for that slightly out-of-scale Lacy M-10.

So much for this month - next time we'll discuss the potential sources of thermals in that room of seclusion. Use your imagination - the discussion should be a real gas.



CLUB CONTEST REPORT by Pat Daily

*****The finals of the outdoor handlaunch glider contest held last summer are listed below:

name	May15	June 19	July 17	Aug 14	Aug21	Oct 16	Total (Best three)
Poretz	205	206	193	192	---	---	604
Sites	---	121	---	165	148	135	448
Clarke	169	89	104	118	---	106	393
Daily	---	---	87	---	146	---	233
Teeples	---	139	---	---	---	---	139
NOb	---	103	---	---	---	---	103

Trophies for first three places were awarded at the December meeting of the D.C. Maxecuters along with a plaque commending Bill Clarke for an outstanding job as the contest director. Congratulations to Steve Poretz for such a fine performance and such consistent scores. John Sites and Bill Clarke should be congratulated also because they really had their own little contest as it is very hard to compete with rubber armed monkeys of the Poretz clan! It should be noted right here and now that next year, yes next year Steve, we (the rest of us slobs) will be more competetive even if we have to stomp on someone's favorite HLG. Therefore, it is proposed by this writer that another outdoor HLG contest be initiated when the weather becomes suitable.

*****Peanut Scale Contest Results for the first half of the winter season:

	October	November	December
1	Daily Waco SRE	Daily Puss Moth	Daily Puss Moth > tied
2	Schanzle Luton Minor	Srull Lacy M-10	Gregory Lacy M-10 > tied
3	Daily Arado-76	Schanzle Luton Minor	Airulla Huntington
4	Schenken Nesbit Cougar	Gregory Lacy M-10	Schenken Nesmith Cougar
5	Meyers Mex. Scout	Meyers Bristol Scout	Rakow Corben Super Ace

The point standings for the club indoor trophy stand as follows:

Daily	14
Schaanzle	7
Gregory	7
Srull	4
Schenken	4
Airulla	3
Meyers	2
Rakow	1

Remember the points are given on the basis of how many contestants you defeat plus 1 point per entry per contest. Also remember that when you win a contest with one plane it can no longer win sole possession of first place in subsequent contests but must share first with the second place winner even if its performance wins first place by itself, ie. Dailys Puss Moth actually won first in the December contest but since it had won first in November it could not hold first by itself but rather it had to share it with the second place finisher Gregory. This provides a handicap for the winners and hopefully will encourage more building.

*****

******Indoor HLG and Pennyplane Results. Well gang there was a decided lack of interest in these two events. This fact plus the problems with obtaining the flying site has made it difficult to stage these two world shaking events to date. It is suggested by this writer that these events be rescheduled at the next meeting. Remember these events were to have equal weight with the peanut scale contests for the club trophy, therefore if someone were to come prepared he could pick up a lot of points for the winter trophy----so lets see some balsa dust, no Allen not balls of dust or whatever.

*****Finally--- get ready for an AMA and peanut scale contest to be held hopefully at the Andrews hangar sometime in Jan or February depending upon when Hurst Bowers and friends can arrange it. Remember AMA scale is anything goes under a 30 inch wingspan. If this can be arranged it should be even more fun than last years fantastic contest. So why not start building that scale ship that Santa left under your tree.

Aero Modeller

Delta Design

and general thoughts on the tailless configuration

by R. H. WARRING

FOR YEARS aircraft designers – both model and full-size, have flogged the 'tailless' aeroplane theme, mainly on the basis that an 'all wing' aeroplane should be more efficient because it eliminates the extra drag and weight of such appendages as wings and tail units. Not until the arrival of the true delta layout, however, did the tailless aeroplane really come into its own.

The ordinary tail-less aeroplane employs either a swept-back wing or a straight wing (Fig. 1), the former nearly always producing the most stable model. For a straight wing to be stable, then the section used must itself be a very stable one – usually having the rear portion turned up quite sharply or *reflexed*. Even so, it will never be quite as stable as a conventional wing-tail layout, nor are the wing sections necessary very efficient, compared with the best shapes for model wings.

The swept-back wing gains its stability from the fact that the wing tips are made a 'stable' section – c by washout (decreasing the incidence), or changing the section to a reflexed one. In effect, the front part of the wing is the main lift producer, and the rear part (on each side) acts rather like a conventional tailplane.

In both cases the result can be a stable flying wing, but not a very efficient one. In fact, to make the stability anything like as good as a wing-fuselage-tailplane combination of good proportions, its actual flight performance will suffer quite a bit. Despite claims to the contrary, flying wings do not make outstanding gliders, nor are they as consistent as their more orthodox counterparts.

The delta wing was arrived at by increasing the sweepback still more and then joining the two tips, resulting in a much better structural arrangement (Fig. 2). It is called a 'delta' wing after the Greek capital letter 'delta' which is written Δ.

The main difference between a delta wing and a sweptback wing is that for the same area, the span of the delta wing is much smaller. This is best expressed in terms of aspect ratio which, for normal wings, is the ratio of span to the chord. On tapered or similarly awkward-shaped wings, aspect ratio is best found by dividing (span)^2 by the area. Thus in Fig. 2 the area of the wing is span x chord and so

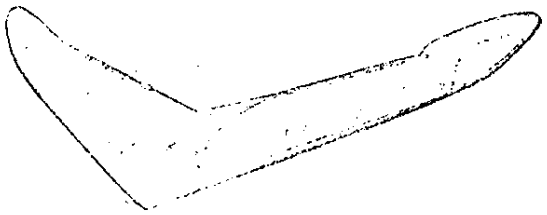
$$\text{the aspect ratio is } \frac{\text{span} \times \text{span} \times \frac{2}{2}}{\text{span} \times \text{chord}} = \frac{2 \times \text{span}}{\text{chord}}$$

This holds true for all truly triangular wings.

In terms of the actual sweepback angle of the delta, chord = span/2 times the tangent of the angle of sweepback (θ). Thus the aspect ratio becomes equal to 4 divided by the tangent of θ, which is a very si formula for arriving at the angle of sweepb required to produce a given aspect ratio.

Normally, reducing the aspect ratio of a wing reduces its maximum lift and increases its overall drag. Once you get down to very low aspect ratios, however, such as 2 or less, the wing behaves in quite a different manner and begins to become *more* efficient. Thus the delta, in spite of its very low aspect ratio, does not suffer from the performance loss associated with normal swept-back or low aspect ratio wings.

Its stability characteristics are also quite different. For one thing, the stalling point of delta wing is quite high – round about 40 degrees as compared with the 10 degrees of a normal model wing. It is also quite stable in the lateral sense, since sweepback is equivalent (although to a lesser degree), to dihedral in producing recovery from a sideslip. Thus a normal delta will seldom, if ever, require dihedral. Dihedral effect is built right into the wing shape.



The Dactyl (available from APS as TG/326, price 30p) is a typical tailless glider and uses elevons for stability, as well as sweep-back. Note use of small tip fins.

With regard to directional and spiral stability, however, the delta is not quite so happy. To keep it flying straight and 'on course' it generally needs a fin of generous area, the smaller the sweepback the larger the fin required. Even so, it can still be a bit tricky in turns.

A low aspect ratio wing also has one further disadvantage. Since the span is short the wing will roll quite readily, so it is not so good at coping with torque, thus the delta is more suited to jet power than it is to being propeller-driven. However, that is not to say that a prop-driven delta is not a practical layout. It is – provided the sweepback angle is not too large, and provided that excessive power is not used. In other words, it is quite suited for a sport model layout but would likely prove very troublesome if 'contest' performance was aimed at. There is also another good reason against the delta layout for a 'contest' performance design – the glide is poor by comparison with orthodox layouts. The delta wing produces less lift than an orthodox wing at all angles and although it may eventually produce the same or even higher maximum lift, this is at an angle where the drag is also fairly high.

The question of what happens when a delta is overpowered shows up quite well on Jetex-powered models. This is because with a constant thrust engine (the jet thrust), the *power* of the engine goes on increasing with increasing speed. Hence the model tends to fly faster and faster under power, the jet engine becoming more efficient all the time. This is just like coasting downhill on a bicycle where the thrust is the same all the time (the pull of gravity), but you go on accelerating so that your speed continually builds up throughout the run. Speed always aggravates stability problems so the model, after a smooth launch, builds up speed until it perhaps goes into a series of tight loops or a spiral dive.

Looping problems are aggravated by the fact that to be really safe, a delta needs a reflex trailing edge. This gives that necessary margin of longitudinal stability to combat disturbances in flight. Normally this reflex is made adjustable by fitting 'elevons' to the trailing edge which are turned upwards an equal amount. If they are not adjusted equally they will induce a turn, which may build up into a spiral dive under power.

With adjustable elevons, the balance point of the delta can be varied over a considerable range. C.G. position is far from critical, except for the fact that the more negative setting you have on the elevons (corresponding to a forward C.G. position), the more likely the model will tend to loop under power.

The traditional paper dart is as good a flyer as most model aeroplanes and has a C.G. position of one half its length. Sweepback angle is approximately 75 degrees and perhaps some slight 'elevon' trimming may be necessary in order to get a flat glide. The same C.G. position (half the chord) is about right for all deltas, regardless of sweepback angle, using just enough elevon trim to flatten the glide. Then take care of power-on trim by mounting the motor with down thrust or, in the case of Jetex power, try using a deflector vane in the jet.

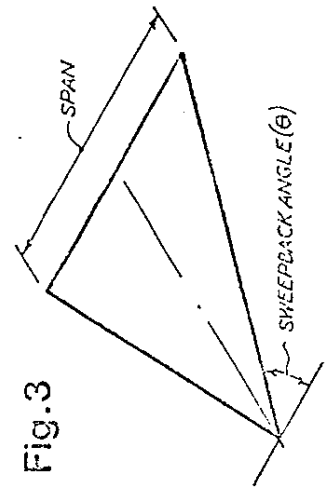


Fig.3

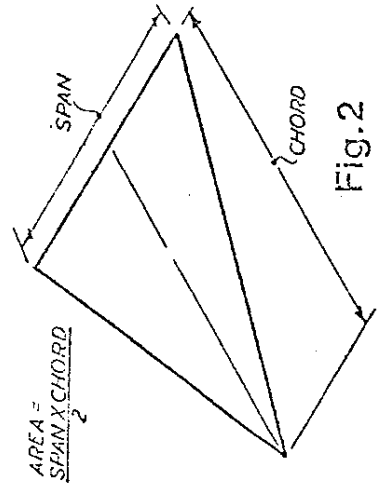


Fig.2

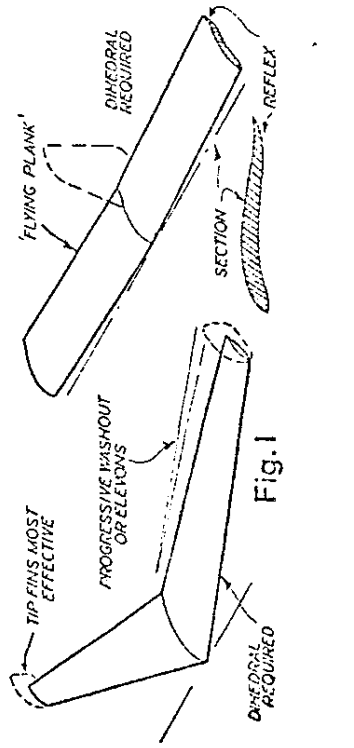


Fig.1

Anything less than about 45 degrees sweepback is inadvisable for a delta. The stability of deltas within this range – say 40 to 50 degrees sweep – is also improved with a degree or so of dihedral plus progressive washout along the whole of the trailing edge of the wing. Because of the longer span, such layouts are best for propeller power. Fin area required is about 25 per cent of the wing area (maximum).

For jet power then, 60 to 70 degrees sweepback is preferred when neither dihedral, nor washout is required, except that there is still the need for elevon trim. Fin area can be reduced to 15-20 per cent and spiral stability is often helped by fitting a front fin. If the model persistently rolls with a front fin, then the front fin is too large. A front fin will definitely help keep the nose up in turns.

Sweepback angles approaching 80 degrees usually result in a model which is very prone to roll and spirally unstable, as well as becoming relatively inefficient. Also the smaller the delta the more critical it becomes as regards adjustment. A perfectly true delta wing – e.g. a 60-degree delta, will trim out and fly quite well, once adjusted carefully, with the C.G. at about 60 per cent – and will fly equally well upside down as right way up, often changing its flight pattern during the course of a single flight. This characteristic is retained by many other delta models, particularly those liable to be drastically upset during flight – e.g. a prop-driven delta with a large propeller which causes it to roll; or a part-the-vertical stall recovery resulting in the model flattening out in inverted flight. Nevertheless, as sports models, deltas are a lot of fun and certainly worth experimenting with.

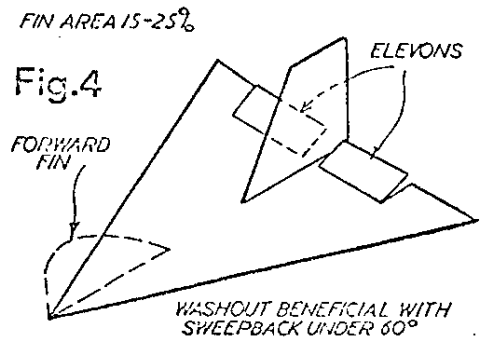


Fig.4

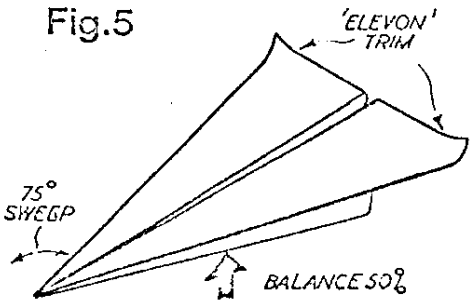


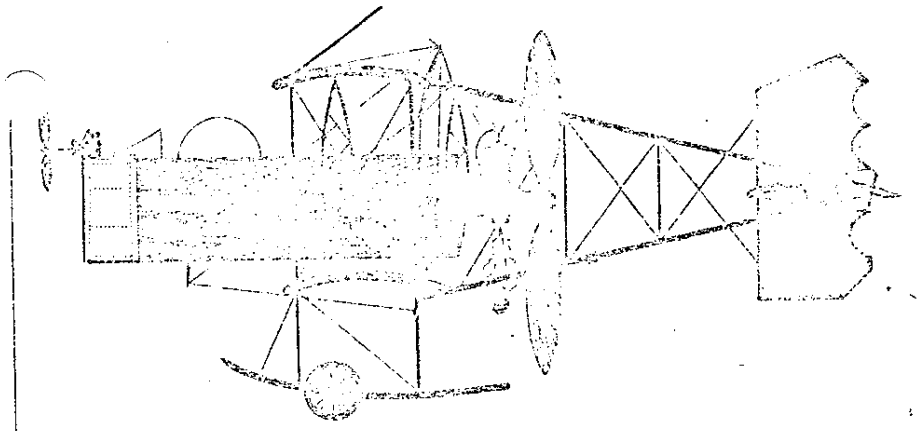
Fig.5

KENNEDY FLYING

SCHEDULE

JAN.	9
FEB.	13, 20
MAR.	5, 12, 19
APR.	2, 16, 23, 30
MAY	7, 14, 21

The wings of war



From: The National Board for Aircraft Improvement

To: All aircraft manufacturers, research facilities and military squadrons

Subject: More effective military and civilian aircraft construction and utilization.

The following directives are to be implemented immediately to reduce cost, improve efficiency and improve front line readiness.

1) All funding and research will cease on the bullet-proof balloon project.

2) Designers shall no longer include the half-moon cutout on the doors of rest room facilities. Recent improvements in literacy have eliminated this historic requirement.

3) Concrete will not be used for any airframe despite its availability.

4) Catapult launches combined with air starts of the new Gumbo Red Eye engines have resulted in a number of crashes. Starting the engines first should improve the performance of this engine.

5) Muzzle loading weapons will no longer be carried by any first-line National aircraft.

6) Wagers shall not be conducted between designers within the hearing of test pilots.

7) Designers should attempt to use more modern motifs for civilian aircraft design. The Russo Pterodactyl has met with less than enthusiastic civilian acceptance, although it is felt that the vertically moving wing could be partially the reason for this.

8) All pilots are encouraged to raise wheels only after the aircraft is airborne.

9) All personnel shall direct efforts towards developing a cockpit heating scheme that will eliminate the need for venting exhaust gases into the cockpit areas. The present system apparently causes the instrument faces to be covered with an oil film and renders them difficult to read.

10) There is an ill-chosen group of words in the latest Slopia Stallion manual. Reference is made to "Wheel Up" landings. This means that the wheels will not extend; this does not mean that the landing should be attempted with the craft inverted.

11) Silk span or model aircraft tissue will no longer be acceptable as covering for military aircraft.

12) Since radio communication is now common, there will no longer be any training conducted using flags for intra-squadron communication. This is to extend to all flight schools and especially to students flying the T-22 Buzzard trainer since it requires that the cockpit be open for the flags to be used.

13) The use of sand bags in engine test facilities is encouraged. Note that this means bags filled with sand, not straw. While straw does make the bags easier to handle, the Borsk Test Facility has found them less effective in stopping flying objects.

14) Parachutes should be packed before leaving the ground. Attempting to do it in the air and waiting until the last minute is asking for trouble.

MANY OF US ARE NOW USING THE FEW SUPERBONDING CYANOACRYLATE ADHESIVES SUCH AS "HOT STUFF", AND THERE CAN BE SOME HAZARDS INVOLVED. THE FOLLOWING PRECAUTIONS ARE EXCERPTS FROM "LOCTITE TECHNICAL DATA SHEET TDS 40A.

GENERAL PRECAUTIONS:

These materials are fast setting adhesives which cure or harden due to the presence of small amounts of moisture absorbed on most surfaces. They are skin bonders and special precautions should be taken to avoid hazards. They are generally non-toxic.

EYE CONTACT:

Cyanoacrylate adhesives are eye irritants and tissue bonders. Therefore, care, in some cases including the use of goggles, should be taken to avoid eye contact. In the event of eye contact, the eyes should be copiously flushed with water, and MEDICAL AID SOUGHT IMMEDIATELY. If eyelids are bonded closed, only a qualified physician should attempt to seperate them. In case of bonding to the corneal surface, forced separation is not recommended. Allow the eye to remain closed and the bond to separate naturally, which will generally occour within a few days.

SKIN CONTACT:

Cyanoacrylate Adhesives are mild irritants to the skin, and are relatively non-toxic. However, strong bonds will form between adjacent skin surfaces very quickly, e.g. fingers. These may be separated relatively easily by soaking the bonded area in warm, soapy water for several minutes, and then gently peeling the bond. Alternatively, a dull instrument such as a thin wire, or a table knife can be forced through the bond. With appropriate caution, solvents such as Acetone or nail polish remover also can be used effectively.

When skin contact is over a large area, the area should be flushed with large amounts of water. A soaking wet cloth can be used to wipe off excess amounts of adhesive. If the adhesive has soaked through clothing, flush the involved area with water. If the cloth has bonded to the skin, the adhesive should be removed by soaking in warm soapy water, or by treatment with solvent such as Acetone or nail polish remover. Rapid removal of the bonded clothing without these precautions might result in skin damage. Cured adhesive will flake from the skin in a day or two, or can be removed by solvent treatment or by soaking in hot soapy water.

ORAL CONTACT:

Cyanoacrylates are relatively non-toxic materials. However, rapid polymerization (hardening) will take place in contact with the surfaces of the mouth. The mouth should be flushed copiously with water and medical aid should be sought immediately. Lips, if bonded can be gently pulled apart, preferably with the aid of water or solvent.

VAPOR EFFECTS:

Alkyl cyanoacrylate vapors are lacrymatory (i.e., tear producing), and can cause eye irritation in poorly ventilated areas.

Mucous membranes can become irritated by prolonged exposure in poorly ventilated areas. Irritation will be most noticeble under conditions of low humidity.

SO BE CAREFUL !!!!