



Loaded Dice

RADIO CONTROL MODELS & ELECTRONICS

If you prefer to glide in flat, be prepared for a long approach.

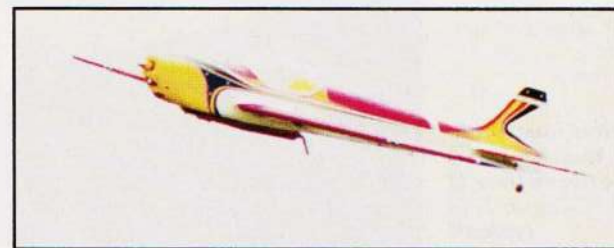


Terry Westrop introduces 'CAD' plans for the latest stretched version of his outstandingly successful F3A aerobatic design

Nineteen eighty four witnessed the introduction of the long awaited continuous schedules known as Turnround, similar in principle to full size aerobatics but somewhat less complex. Turnround was indeed good news for R/C aerobatics and was welcomed by the majority, undoubtedly a progressive step. The governing body of our sport, the FAI, do not always make decisions quite as beneficial for F3A and I believe the rule changes which take effect in '96 will make it no easier for aspiring pilots to take up a competitive route (*turn to our Turnaround column for other opinions on this!* - KC). Those in contention at the top will have little alternative but to operate models appropriate for these new rules, i.e. two metre length or wingspan, 5 kg weight limit using any powerplant. Quite naturally two stroke competition motors of 20 - 25cc will emerge, along with 25 - 40cc four strokes wearing price tags that would normally adorn a good computer radio set. And so the 61 size motor that has 'contained' the size (and corresponding cost) of F3A models since time began will eventually become a rarity.

But for those many more who simply (for the time being) wish only to fly or compete with a design that is not so far short of the two metre models, this 'stretched' Loaded Dice will not disappoint. Although I have continued to operate the 'Hanno Special', albeit on even higher nitro fuels in order to maintain competitive power to weight, this version will accept the Super Tigre 90, OS 108 and, better still, the Webra 80 Competition. The Webra 80 mounts almost identically to the 'Hanno' but the side exhaust motors can be mounted at 90 degrees, extending the firewall down to the base of the cowl and leaving the cowl as part of the fuz (i.e. do not cut the cowl away but remove sufficient material from the right side for the motor and mount). Do try to fit a soft mount system of some type, along with a reasonable prop - they are beautifully quiet and must prolong the life of the airframe and servos. Some details are included on the plan.

This latest Loaded Dice IIS was first used 'in anger' on day three (normally fly off day) of the '94 Nationals and despite



the severe cross winds and turbulence there was no doubting the superior presentation and flight characteristics. Had I not afforded myself the option of flying this 'stretched' version of Loaded Dice 68, I might not have achieved that Nationals victory.

What's new?

During the majority of any aerobatic programme the fuz is on view more than any other part of the airframe, so by increasing the fuz to almost 1.9 metres we find ourselves close to the new regulations for presentation value. With a revised tip section and a slight increase in wingspan, overall drag is minimised.

It is noticeable that I still resist the 'need' for plug-in wings and an enclosed pipe. I believe in simplicity, accurate building, competent design and a nice looking model that fills me with the desire to fly with graceful precision.

A real floater

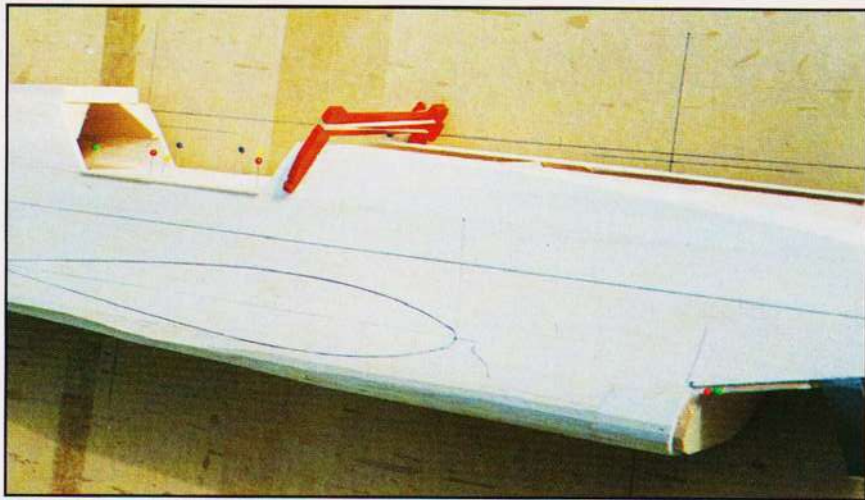
Always remember that Loaded Dice IIS has been developed to combat typical British weather conditions (i.e. high winds) encountered at competitions.

IIS



An open pipe and one-piece bolt on wings keep things simple and improve reliability.

Accurate marking of datum lines during assembly will help to ensure a well built airframe.



How much side thrust?! You'd better believe it - up to 7i is typical!



Engines and pipes

This subject is not simple to explain in detail so I will endeavour to briefly describe the best route, not necessarily the most economical. Obviously the OS 'Hanno' 61 is supplied with a 'Hanno' pipe and, along with the stainless steel rear bearing and plated crankshaft, it is almost foolproof on any nitro fuels. The 'Hanno' pipe is typical of the type used in aerobatics at present; the 'Hatori' long chamber is the equivalent (Hatori 700 pipe, I believe) - not so much a power pipe as a torque pipe. Consequently it is much easier to set up on any motor from an ASP or MDS 61 to a Webra 80 or Super Tigre 90. This pipe, or tuned muffler to be precise, is very flexible in operation, light and beautifully made, though they are quite expensive. These pipes are intended for use at around 10,500 rpm static and with the motor soft mounted at this rpm it will prove extremely quiet, so you will need to prop accordingly. A standard RFP OS 61 would turn an APC 12 x 10 on low nitro at around 11,000 rpm, a 12 x 11 on say 15% nitro or more at 10,400. Carbon fibre pipes such as the Bolly EQ60 and EQ62 operate at similar lengths.

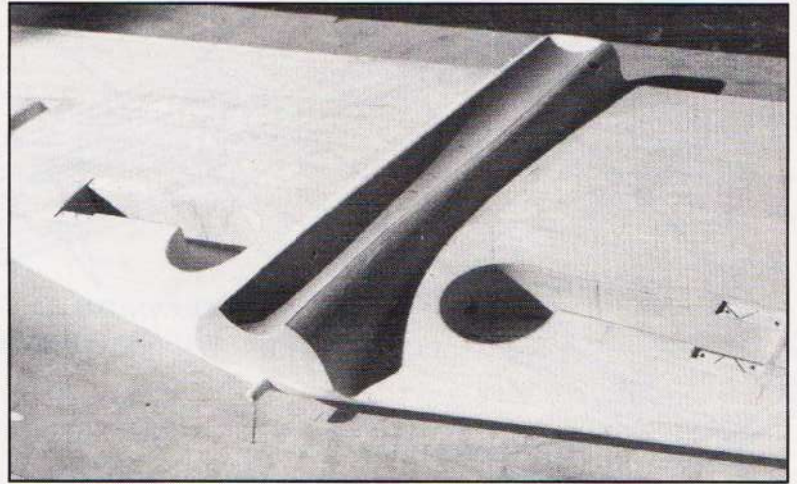
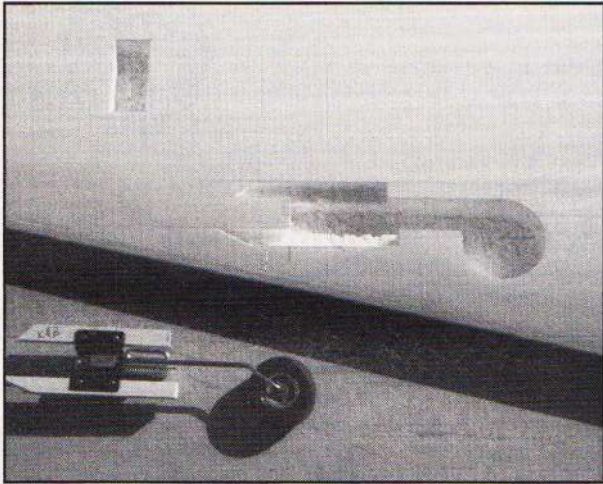
Manifold length starts at around 9 to 10". The quick way of finding the most efficient pipe length is to have a number of props, all the same make,

The design's ability to cut through turbulence allows a good top speed to be achieved if required, however low speed handling is unquestionable. Due to the efficiency of the airframe, landings require a nose up attitude similar to that of modern jets, and for similar reasons, although we are not in the same league as the F-15 or Mirage when

talking about attack angles on landings. A good indication of an ideal landing, so long as your model remains within the boundaries of the plan specifications and is not excessively heavy (over 9 lbs.), is to touch the tailwheel first. If you prefer to glide in flat, be prepared for a long approach.

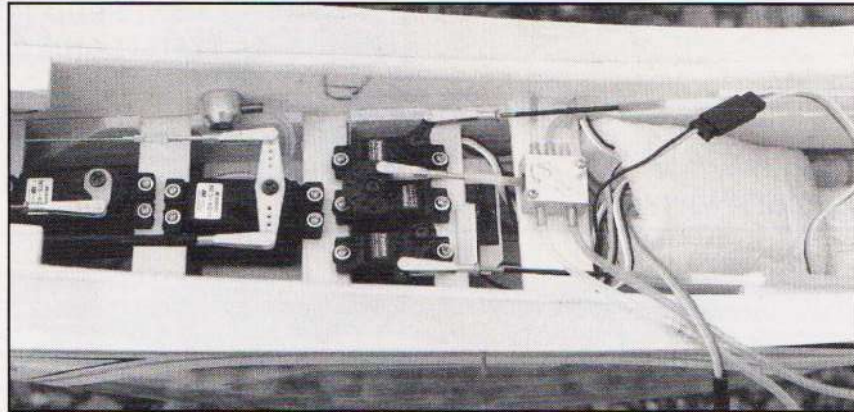
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that you feel the motor will accept. So for the OS RFP try a 12 x 10, 12 x 10w, 12 x 11 and a 12 x 11.1/2. Try each at the maximum length. If all is well shorten by 1/2" and repeat the experiment. A tachometer is useful but not essential.

Do remember that many 'normal' tuned pipes, although less expensive, will almost certainly be more difficult to set up on any motor and probably will be noisier. Basically you need a single cone (i.e. a flat reflector type) not the twin cone type which are generally intended for higher rpm use. The chamber length immediately following



Top left: The retracts are mounted on wooden bearers, epoxied into the foam wings. Top right: The pipe tunnel takes shape. Left: Tandem servo mounts keep everything in line, ensuring straight control runs.

Fig A

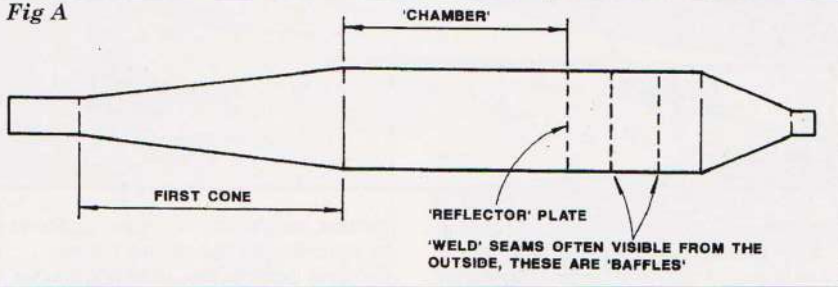
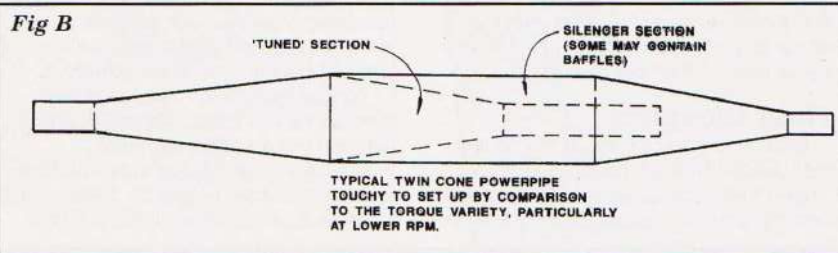


Fig B



the cone can be in the region of 3 to 6" to the reflector plate. See Fig A.

'Normal' (twin cone) pipes are basically intended for use at higher rpm, hence the term 'Power Pipe' and these vary in shape depending on the required rpm band. Naturally high rpm usually means noise and so they are not favourable in current competition aerobatics. Motors such as the MDS or ASP for example would welcome the use of the torque pipe to 'tame' their characteristics, allowing the operator to set them up with more ease. Similarly, 40 to 53 size two strokes can benefit from the use of the 'Hatori' 451 torque pipe, again for operation below 12,000 rpm. In general a more substantial prop can be used on the torque pipes, possibly 1" more in pitch depending on the fuel mix. See Fig B.

A retailer with knowledge in aerobatics should be capable of

The use of screw type control horns allows fine tuning of the control surfaces.

Supplementary construction notes

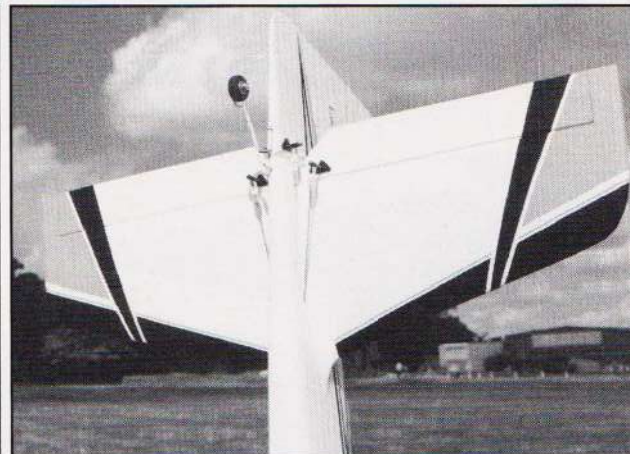
The construction of Loaded Dice is similar in most respects to the original Loaded Dice 68, plans for which were fully described in the July and August 1993 issues of RCM&E. For those readers without copies of these issues, photocopies of the Loaded Dice construction articles are available from the Nexus Photocopy Service for £5.00, inc. p&p.

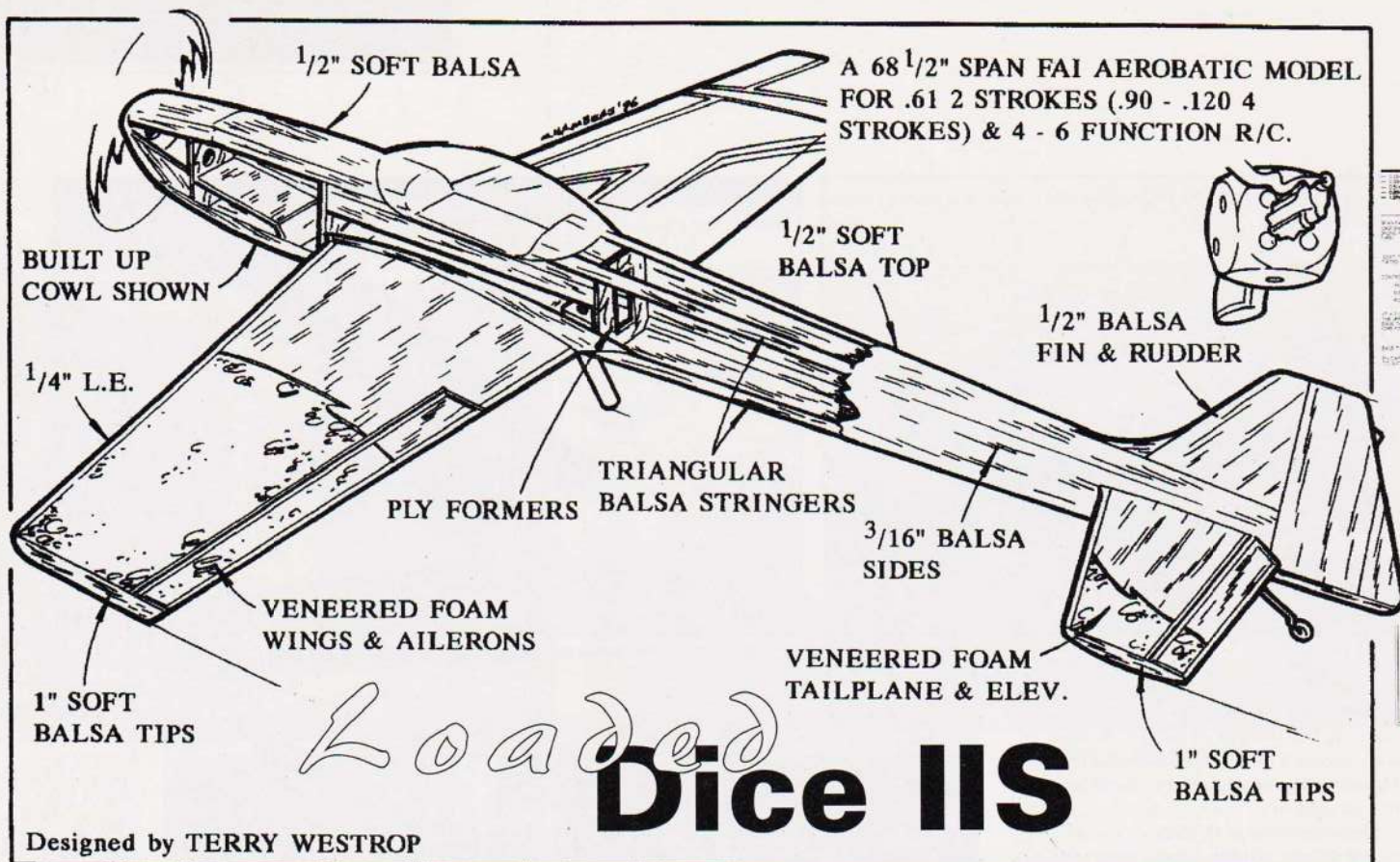
Builders of the new Loaded Dice IIS should note the following amendments:

- Nexus Modelling Supplies ISO rubbers can be used between the existing mount and firewall.
- The wing bandage is taken out to 4"

width, taking care not to sand into the veneer.

- An 8mm hollow carbon tube can be used as alternative to the 5/16" wing locating dowel.
- A little filler added between the 1/64" ply and wing surface at the pipe plate area will avoid particles falling into the underpan, never to be retrieved.
- Reinforce the tank bay with polyester resin and carbon fibres.
- The tail/wing incidence should be 1/3 - 1/2° wing positive.
- Up to 20 oz fuel tanks can be used.
- If using ABS cowl, clamp across fuz at the rear of the cowl before gluing bottom sheet, to avoid spreading sides.





Far right: Fuselage equipment, ready for installation.

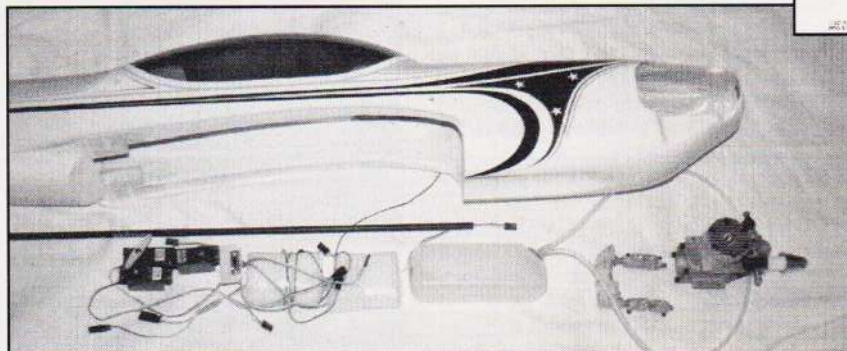
supplying such pipe options, such as Dave Smith Models in Yorkshire.

What has to be...

I began with an introduction criticising FAI rules and I feel I must end similarly by apologising for the Masters programme many of you may see flown, perhaps for the next two seasons, particularly at our Nationals. You may see precise flying but the new FAI programme, designated the 'C' is most disappointing, lacking content and imagination. It is no reflection of how I, and many others, feel aerobatics should progress.

Yes, the UK did propose a 'radical' new, reasonably dynamic programme, sensibly constructed to allow good presentation and potential for spectator appeal. Just as important, it would have provided our hard working judges with a more acceptable task, but our programme was lost in the FAI 'system'!

We could easily have adopted an alternative programme to be used in the UK only, hopefully to show we know what we are on about but, understandably, there is always some reluctance to 'rebel'



against authority, the majority voting to 'obey' the FAI. Aerobatics will progress eventually - it will have no alternative - but the UK could well have been one of the first pioneers, perhaps influencing the future of aerobatics world wide... Oh well, we've missed the boat again!

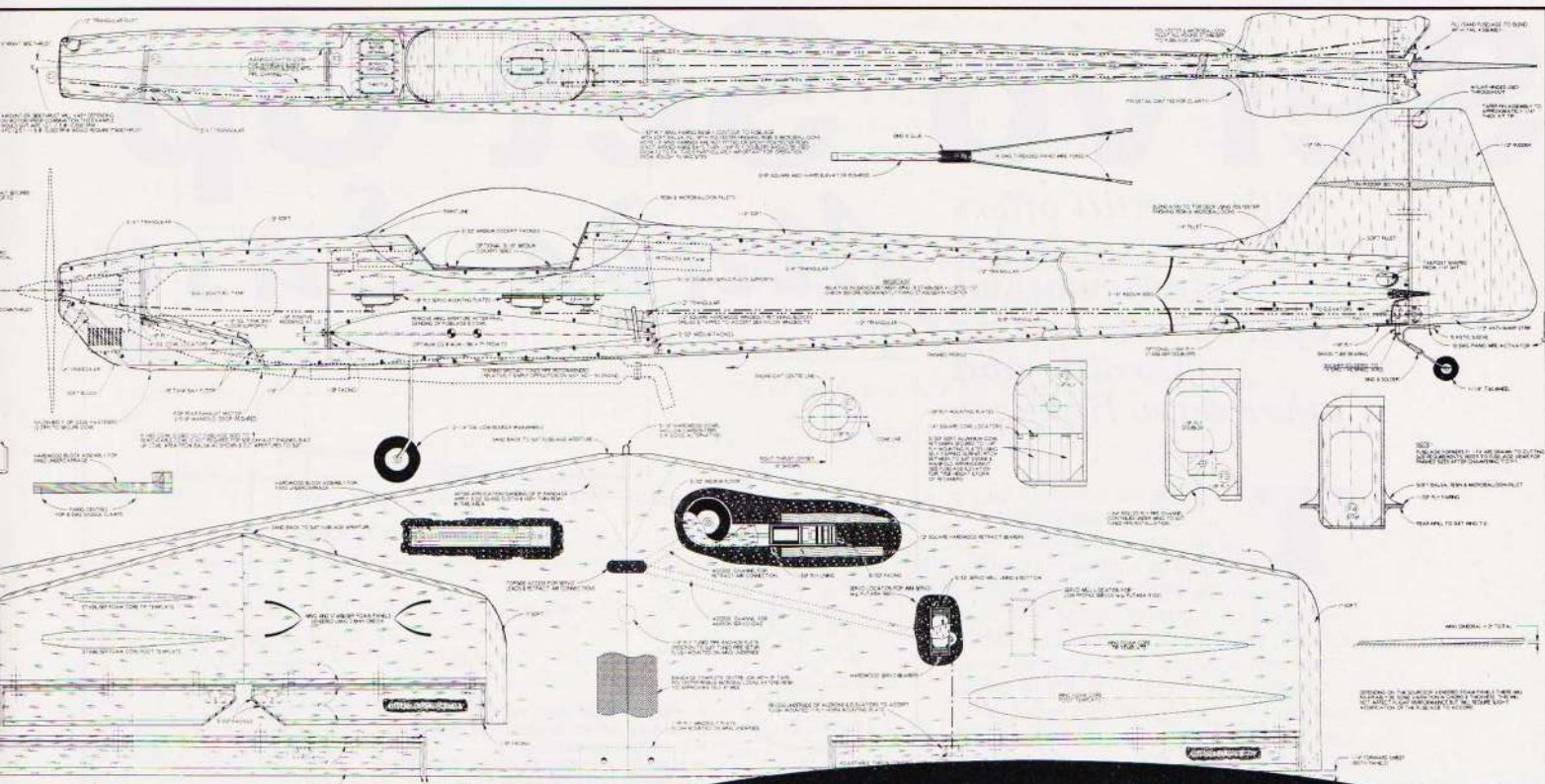
Final thoughts

Back in '93, I really thought it unlikely that Loaded Dice 68 could be improved, indeed that version remains the longest serving and therefore has achieved more

contest credits than any other. However by extending the tail moment, pitch damping is increased, providing greater stability, improving roll transition and assisting slow and four pointers. It also enhances smooth flight and I believe this Loaded Dice is even more attractive.

Almost every R/C modeller will fly aerobatics and would wish to fly any figure more accurately or more spectacularly, perhaps a slow roll from sun up to sunset or a triple snap roll just after take off. Loaded Dice IIS will not





CAD plans for Loaded Dice IIS are available from the Nexus Plans Service for £9.00, plus £1.75 UK p&p (£3.00 p&p overseas). Please quote plan number RC1817. A foam wing and tail set (FWTRC1817), and a matching cowling (COWRC1817) and canopy (CANRC1817) are also available, priced at £34.50, £7.20 and £6.00 respectively, inc. p&p. Please note that these auxiliary items are only available within the UK.



Trim stars make handy servo covers!

'automate' those or any other figure but will assist the accuracy and smoothness of every stick movement you dare attempt. Loaded Dice lives on and I can find no reason to alter either the appearance or flight characteristics as I begin designing for the new generation of +20cc F3A aerobatic engines. ●

Datafile

Plan Specifications

- Name
- Designed By
- Aircraft Type
- Wingspan
- Wing Chord
- Wing Area
- Aerofoil
- Tailplane Span.
- Tailplane Area
- Tailplane Section
- Fin Height
- Engine Range
- Fuel Tank
- Rec. Number of Channels
- Control Functions

- Loaded Dice IIS
- Terry Westrop
- F3A Aerobatic
- 68.1/2"
- 16" root, 9" tip
- 12 sq.ft.
- Symmetrical
- 25"
- 1.35 sq.ft.
- Symmetrical
- 10"
- .60 - 1.08 cu.ins.
- 12 - 20 ozs.
- 4 - 6
- Aileron, elevator, rudder, throttle. Optional retracts and in flight mixture control
- +5/8", -3/4"
- +/- 1/4"
- +/- 2.3/4"
- 4 - 7°
- 1 - 2°

- Elevator Throws
- Aileron Throws
- Rudder Throws
- Sidethrust
- Dow thrust

Materials Used in Construction

- Fuselage
- Wing
- Tail Surfaces
- Weight, Ready to Fly

- Balsa & ply
- Veneered foam
- Veneered foam
- 7.8 lbs.