

**Your
FREE
full size
plan . . .
compliments
of R.C.M.&E.
and DAVID BODDINGTON
who created**



MINI-TYRO

*for the gentle art
of single channel R/C!*

SINCE the introduction of the 'Tyro', full-size plans for which were given away with *R.C.M.&E.* December 1966, many modellers have cut their 'R/C teeth' on this design. Here we have the junior version, of which retains the easy building and flying ability of its larger brother, but will take the modern sub-miniature equipment with ease. Small aircraft, such as this, are particularly suitable for 'backyard' flying and are handy to have around for those odd few minutes you can spare for flying when it would not be feasible to prepare a larger model.

The Mini Tyro will take beam or radial mounted engines without any basic change of construction, just remember to fix some blind nuts on the rear of the front plywood former if you intend to use a radially-mounted motor. If you like to have a longer engine run than is possible with the fuel tanks shown, fit a metal tinplate tank between F1 and F2.

General

Familiarise yourself with the drawing, and ensure that all stages of the construction of the aircraft are thoroughly understood. Cut out all sheet parts before commencing construction as this will save time at a later stage. P.V.A. glue is recommended for all the construction with the exception of engine bearer joints to the plywood formers, where Araldite should

be used. The constructional design of this model is amply strong, and, therefore, light grades of balsa wood can be used except in the maximum stressed areas. This will help to keep the completed weight to a minimum, care should also be taken in selecting wood of equal quality where paired, i.e. fuselage sides.

Test Flying

Once the engine and radio equipment have been installed and everything tested and operating 100 per cent, it is time to consider flying. The model should weigh somewhere in the region of 13 oz. complete, but don't worry if it is a little heavier.

Providing the C.G. is correct, there are no warps, and the incidences are as shown, there should be little to worry about. There should be no need to test glide, have the engine running at least at three-quarter power and launch straight and fairly fast, rudder movement should be restricted to about $\frac{1}{4}$ in. either way. Trim out turning tendencies on the glide with trim tab and turn under power with side thrust. Adjust elevator trim with $\frac{1}{32}$ in. packing according to wind conditions and penetration required. Because the Mini Tyro is small and light, it will take knocks very well, these 'tiddlers' tend to bounce rather than break.



Mini Tyro

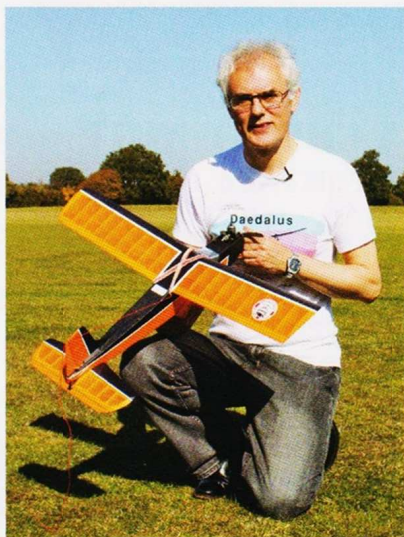
I can remember spending all afternoon one summer holiday with nothing more than a Mini Tyro and a can of Keil Kraft diesel.

ANDREW BODDINGTON PAYS HOMAGE TO HIS LATE, GREAT AEROMODELLING FATHER WITH A CLASSIC 'BODDO' DESIGN

Despite being David 'Boddo' Boddington's son, I'm not what you would call a prolific aeromodeller these days. I do build the odd free-flight or small R/C model every couple of years, but my glory days of aeromodelling were as a youngster in the 1970s when I built many first test models for dad: a Fokker Eindecker for the BBC production Wings, a Mannoek for the Goodies' dodo to fly, and I also provided much (unpaid!) help on many of his projects. Looking back, I'm amazed I had time to go to school! I did squeeze an education in, though, and leaving home for



There's a lot of fun to be had with a simple, easy-build model like this.



Dad would certainly have approved of the colour scheme, it's classic 'House of Boddington'.

university in 1980 put an end to my regular modelling.

Mind you, I never lost touch with model building and flying and would always catch up with dad's latest activities and attend a couple of flying events with him every year. Top of the list were the Vintage and Scale days at Old Warden when dad and I, plus good friend John Ashby, would join all the others to fly free-flight and become ageless with the thrill and wonder of it all.

One year on since dad's death, and the family all still miss him so much. It's such a weird sensation to attend a model aircraft event and know that he isn't there. To continue the celebration of his life I felt it was time to build one

of his designs, which had me recalling the last of his that I built. It came as a shock when I realised this was over 30 years ago - the Sorrell Hiperbipe featured on the front cover of the March 1980 issue of *RCM&E* (held by my sister Sarah, who was then 17 and would claim she was a cover model!). How time flies.

CHOICE MATTERS

I opted to build the Mini Tyro because of its myriad of personal connections and the fact that it's a nice, tidy model of the right size. I'd not built a Mini Tyro before the version featured here; the first R/C model I ever built - in the early '70s - was the Tyro, guided by two-function (rudder / elevator)



Galloping Ghost radio, powered by an ED Super Fury 1.49cc diesel and covered in (early) silver and blue Solarfilm. We were still learning about the best use of plastic films back then, discovering that diesel fuel with Solarfilm led to the covering going a little 'baggy'. The Tyro was later re-covered in doped tissue and nylon to fly many times, this before being passed on to another beginner.

Now, I have previously flown a Mini Tyro, built by my old friend and contemporary Stephen Toyer, back in the mid '70s when the Mini Sanwa two-function radio first appeared. At just under £50, this was an inexpensive radio with a small receiver, flight pack and servos; we both had a set and they did sterling service in many models with great reliability, although the metal-g geared servos were a little noisy. Stephen's Mini Tyro was powered by a Mills 0.75, and I can remember us spending all afternoon one summer holiday with nothing more than the model and a can of Keil Kraft diesel, flying it around ourselves until we were nearly dizzy. In fact, the flying only stopped when the receiver battery was so low that the servos had slowed to a near stop!

TO DATE

Wind forward 35 years and we now have radio that's cheaper in both actual and real terms. It's smaller, too, so three functions will easily fit into the Mini Tyro.

With a little searching through dad's Mills diesel spares box I was lucky to find an R/C throttle for a Mills 0.75. Where this came from I don't know (there are so many questions I want to ask him), and it's the only one I have. Anyway, I test-ran the now-throttled .75 and found - as is often the case with small diesels -



that response wasn't brilliant, with a bit of burbling before speeding up. However, we're not looking to do precision aerobatics, so in it went.

MODS AND TOOLS

The Mini Tyro was originally published as a free plan in the March 1970 issue of *RCM&E*, however the copy of the plan I built my model from pre-dates this to when it was called the Victor 32. This is an 'old school' build and, as per dad's original instructions, I mainly used PVA glue, with just the odd bit of epoxy around the bearers and front formers, plus cyano where I wanted to strengthen a joint. Protect the plan by rubbing a candle on all the areas under glued joints before building, or cover with clear plastic, and you're good to go.

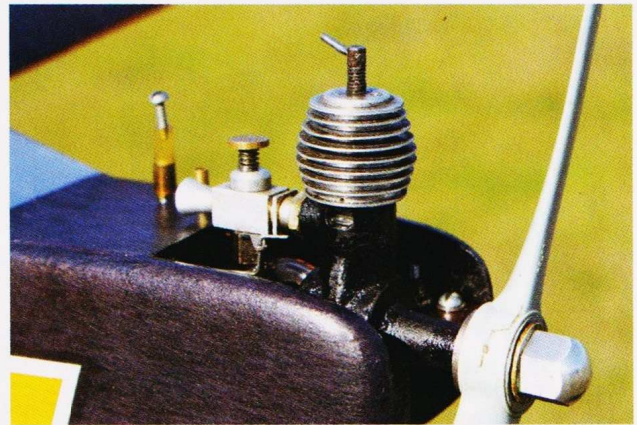
The original rudder-only, single-channel installation was described as 'sub-miniature', which as a description hasn't aged well when you consider the current Flying Toys

range of wonderful indoor models! To go 'multi' I decided to add the elevator as a 16mm strip of 2.5mm medium-hard balsa (okay, I'm lying, I can't do balsa in metric, it was really 5/8" strip of 3/32") onto the tailplane t.e., and to permanently glue the tailplane to the fuselage. The rudder was run to the full height of the fin, and other changes from the original include sheeting the whole wing centre-section with 1/32" balsa, plus the addition of 1/16" sheet doublers to stop the wing-retaining bands pulling through.

Changes to the fuselage include a false floor (under the bearers between F1 and F2) for a metal tank to rest on, and a cut-out low down in F2, large

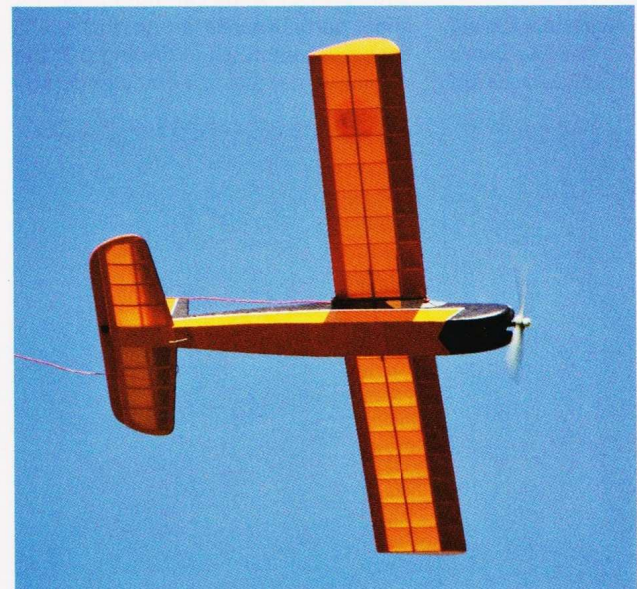
The nice thing about building this model is that you'll have it finished almost before you've started. It's that quick!

Stitching the control surfaces isn't compulsory but give it a try, it's not as difficult as it seems.



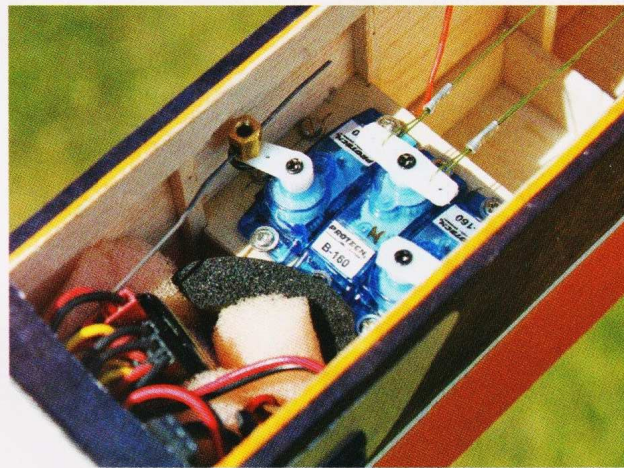
enough to allow a small battery pack to poke forward to help the C of G. You could choose to mount the engine directly to the bearers if they were made a little wider, but using a paxolin plate does save the engine from damage by breaking first if you hit terra firma too hard! I decided to do without an undercarriage, having taken the advice given in an early edition of dad's book *Building and*

It had to be a diesel engine for me but some will undoubtedly go the electric route. And why not?



I covered my Tyro using iron-on Litespan from Solarfilm; the tissue effect is great and it's diesel-proof, too.

Miniaturisation makes things easy, so it's micro servos all round.



The simple constant chord flat-bottom wing is dead easy to build.

Flying Radio Controlled Model Aircraft "...where there's little or no hope of taking the model off, is an undercarriage really necessary?"

If you've not built many classic balsa designs before, sitting and looking at the plan's different views and mentally putting things together will avoid mistakes later on. Do make your own kit up by cutting out all the sheet parts before starting; this will save frustration when finding that the piece you need to cut out is under the

structure you're building! Careful cutting and sensible wood selection does make a difference on a small model, with attention paid here reaping dividends in terms of weight and strength. With photocopier access readily available, the time-honoured destruction of original plans or laborious carbon copying of shapes onto plywood can now, thankfully, be avoided.

The following tools are essential for this type of building:

- Stanley knife and small scalpel
- Razor saw
- Small set square
- Razor plane
- A small electric jigsaw or hand-held fret saw
- A drill (hand or electric)
- Glass-headed pins and sprung clothes pegs
- Fine and medium sandpaper or abrasive blocks

Of course, long-lasting tungsten carbide abrasive blocks are available these days, however I well remember in my youth dad's ritual of starting a new build by clearing the work bench

and covering a couple of wood blocks with different grades of sandpaper.

TO THE BOARD

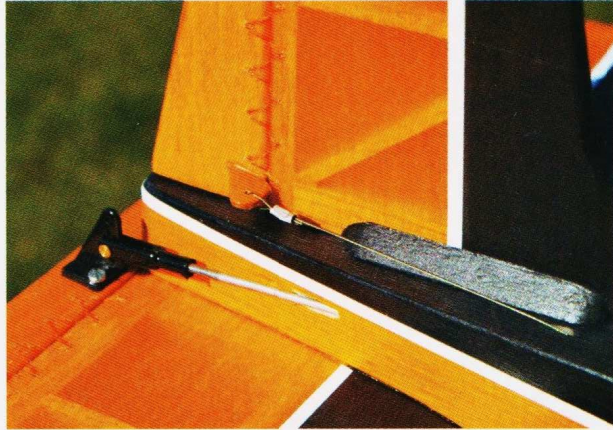
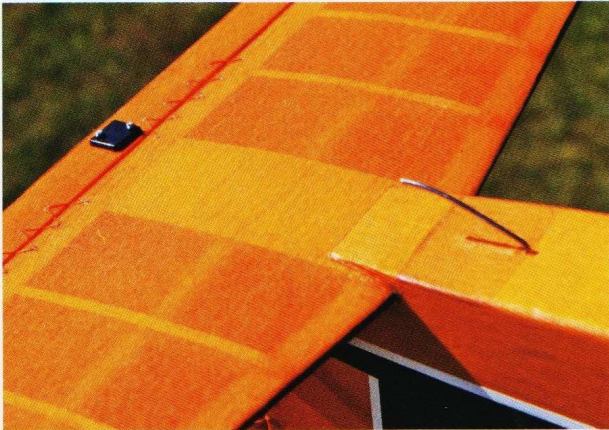
I like to build the fin and tailplane first before getting onto the meatier pieces of an airframe. The fin, then, is built-up from 1/8" balsa, whilst the tailplane has a central core of 1/8" balsa with 1/8" capping riblets added top and bottom. Once this has set, plane and sand the tailplane down to the correct section and round the trailing edge as shown.

The fuselage sides are 1/16" balsa with 1/8" longerons and uprights, and thicker nose doublers added to the inside. Be sure to make handed, left and right fuselage sides, and mark the positions of key formers and doublers onto them before gluing to ensure a square fuselage. If your engine has a throttle, work out the run of the throttle cable / wire before fixing F1 and F2, and drill holes accordingly. When joining the fuselage sides, work carefully (using a set square) and begin by gluing the parallel sides from F1 - F4. Once this has set, cut the 1/8" square cross members to size for the rear (top and bottom), using the fuselage plan view for dimensions, then join the rear of the fuselage over the plan and add the cross members. Remember to use that set square to keep the sides vertical whilst making sure that you don't build-in a 'banana' curve. Use pins and blocks to keep everything aligned until the glue's set. As I wasn't going to fit an undercarriage, I made a sandwich of 1/16" ply and balsa instead of 1/8" balsa sheet for the lower sheeting between F1 and F2.

The wing structure is classic Boddo; strong and light. Dad designed over 500 models and I'd guess that nearly half of them have this same basic configuration of ribs, spars, sheeting and webbing, because it works! You

Models like this are what the Boddo Mills was made for!





The little tail skid helps preserve the underside of the tailplane.

Rudder control is via closed-loop, whilst the elevator is driven by a pushrod.

can laboriously hand-cut each rib individually, but I used the sandwich method. Start by cutting two 1.5mm plywood wing ribs and a stack of rectangular balsa blanks a little larger than the maximum dimensions of the ribs (plus a couple of spares in case of breakages). The balsa blanks are then sandwiched between the ply end ribs using a couple of drilled holes and threaded studding (I use 8BA studding that's older than I am, but I'm sure metric would work just as well!). Next, use a razor plane to roughly shape the balsa blanks followed by sandpaper to finish off, being careful not to abrade the profile of the ply ribs. The spar slots are cut using a razor saw and, if necessary, finished with a small square file using spar-stock balsa to check for a good fit.

Be sure to build one left and one right wing panel, using the root rib template to set the dihedral. I also used the set square when gluing the other ribs in place. For warp-free wings, make sure the spar stock wood is straight (look down its length to check), and use relatively hard stock for the i.e. One of the last actions when building a wing panel is to glue the 1/32" shear webbing between the front spars, with the grain running vertically.

When joining the two wing panels, add the ply dihedral braces, using slow-setting glue to give yourself time to ensure everything's straight. I used pegs to clamp the two root ribs together, with each panel propped up (at the correct dihedral) by wooden blocks running full chord, this to ensure that no twists are introduced.

COVER, FINISH...

If I was building the Mini Tyro 40 years ago I would undoubtedly have covered it with dope and coloured lightweight nylon. This would still produce a lovely durable finish today, but I'm very happy to use a modern alternative in the form of Litespan

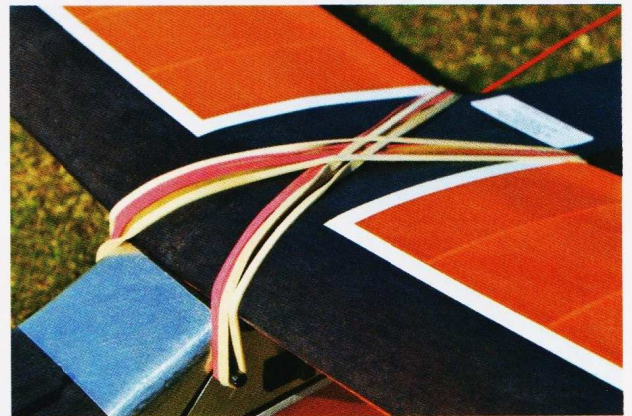


I chose not to fit the undercarriage, though if you fancy, details are shown on the plan.

from Solarfilm; it's great to see a British firm like Solarfilm still producing new coverings after 40+ years. I like Litespan for not only is it both light in weight, with the appearance of a traditional tissue finish, it's stronger than tissue and resists punctures and tears. It's also well behaved with diesel fuel - just be sure to fuel-proof the engine bay and nearby Litespan edges.

The colour scheme and layout I've chosen is traditional 'House of Boddington' and can be found on everything from dad's earliest radio models through to the full-size Barnstormers' DH Tiger Moth.

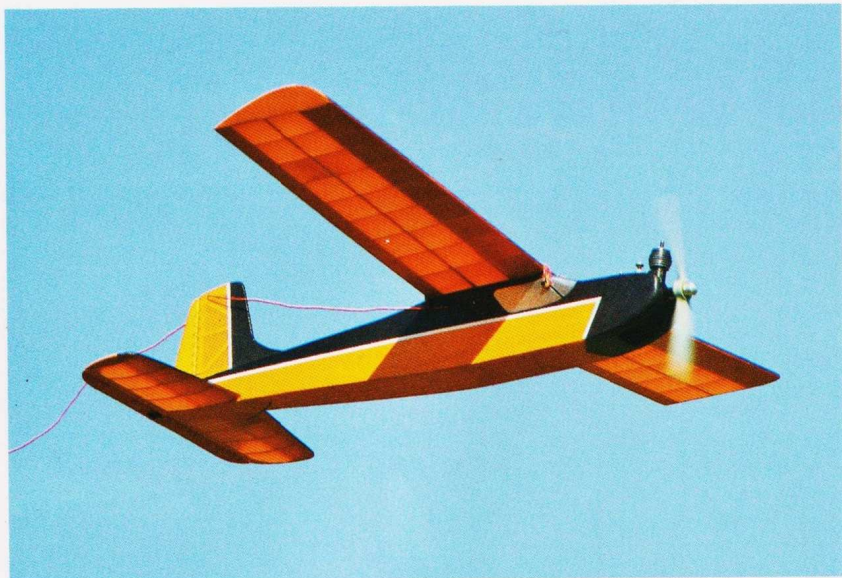
The rudder and elevator hinges are formed after covering. In fact, even after all these years, I'm not sure you can do better than sewn hinges on a model like this. Don't be tempted to push the needle straight through the balsa as it'll split; drill all of the holes first, just large enough to take the needle and thread. The sewing follows a figure-eight pattern, going once end-to-end and back for each section, e.g. up through a stabiliser hole, down through the gap between elevator and stabiliser, and then up through



an elevator hole, and so on. Once finished, use a small spot of glue to seal each hole where the thread enters the wood.

Carefully mark where the fin will sit on the fuselage so that it's straight, and then cut away the covering to the bare wood. Use slow-setting epoxy and pin everything in place, ensuring things stay square whilst the glue sets. I also added some triangular stock balsa either side of the fin to make certain it stays where it should.

The servos mount on a plywood plate that's retained with screws to small bearers glued inside fuselage. A



traditional dowel pushrod with wire ends has a straight run to the elevator, whilst the rudder is connected with a closed-loop, crimped wire system. With the battery pack under the tank, the centre of gravity was well forward, and no extra nose weight was required.

...AND FLY!

I finished the model in time for the Boddo Memorial fly-in at Old

Warden in May (you may have seen it in Alex Whittaker's fine - and almost accurate - article in the July issue of *RCM&E?*) but the weather was against flying it. It wasn't until July that my Mini Tyro had its maiden flight, with David Toyer's help at the helm. I'm glad to say that this was a drama-free event, with the model flying straight and true with virtually no trimming required. It's an

easy model to fly, responds well to control and, as its name suggests, would suit anyone from raw beginner to seasoned campaigner looking to relive the somewhat simpler '70s. On the second flight David handed the transmitter to me and, as I flew some gentle circuits, I could hear dad's words in my head, "Keep the model in front of you and get ready with a bit of down elevator as she turns into wind..." He may be gone, but he's always there.

DATAFILE

Name:	Mini Tyro
Model type:	Retro / vintage
Designed by:	David Boddington
Wingspan:	32" (812mm)
Fuselage length:	23" (584mm)
Wing area:	168 sq. ft.
All-up weight:	13oz (370g)
Wing loading:	11oz / sq. ft.
Functions (servos):	Rudder (1); elevator (1); throttle (1)
Control throws:	Elevator ± 0.4 " (7mm); rudder (measured at base) ± 0.35 " (9mm)
Rec'd engine:	0.75cc diesel

MINI TYRO

A 32" SPAN R/C SPORTSTER
 ORIGINALLY DESIGNED BY DAVID BODDINGTON
 & UPDATED BY ANDREW BODDINGTON

