

**PRO PLAN**



**Build Peter Sztencel's**

**.35-.40 powered sportster**

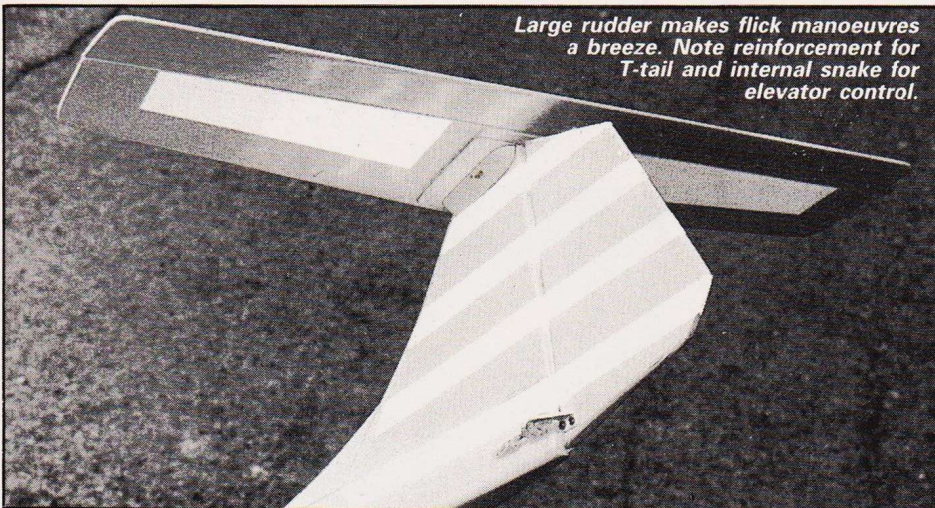
**from our free plan**

**T**HE Phoenix series developed after I bought my first four stroke engine; rather than the more usual 'box' to burble about the sky, I decided to build something that would be responsive enough to bely the four-stroke's unfairly given dull image.

The Mark 1 was called Syzygy (a dictionary job!) and had a conventional low tail. It suffered from a twisted two-piece elevator, which finally caught up with me at ground level...Crunch. The Mark 2 had a higher aspect ratio, a one piece elevator, and a lifting section tailplane. It flew very well, but looked ordinary. The T-Tail modification transformed the Phoenix (the name seemed appropriate), and this Mark 3 arose from the literal and metaphorical ashes of Mks 1 and 2 (respectively).

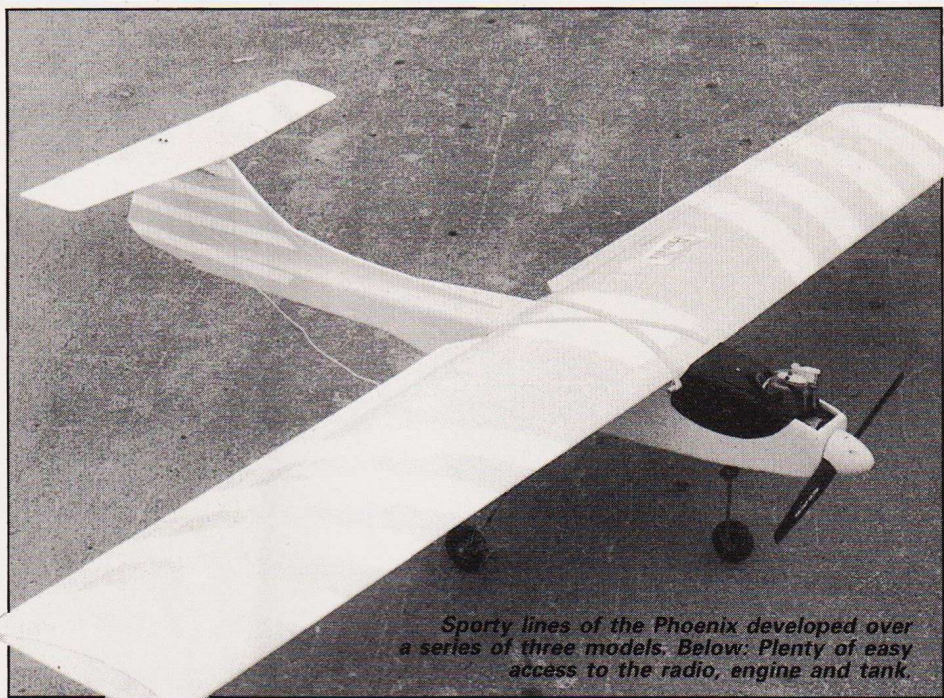
### Fuselage

Cut sides, and glue ply doublers in place (left and right sides, please!) Fit longerons and braces. Prepare formers, cutting holes for throttle and snakes, fuel tube and engine mount before going any further. Ensure F3 will fit (tightly) between 1/4in sq. uprights. Join sides at F2 and F3 and (using a slow-setting epoxy) F1 and the u/c block. Assemble over plan to guarantee a straight structure. Fit motor to mount, and offer up to F1; adjust nose length to suit, then pull nose in, and join with more 1/4in sq. Fit front ply plate, after cutting



*Large rudder makes flick manoeuvres a breeze. Note reinforcement for T-tail and internal snake for elevator control.*

# PHOENIX



*Sporty lines of the Phoenix developed over a series of three models. Below: Plenty of easy access to the radio, engine and tank.*

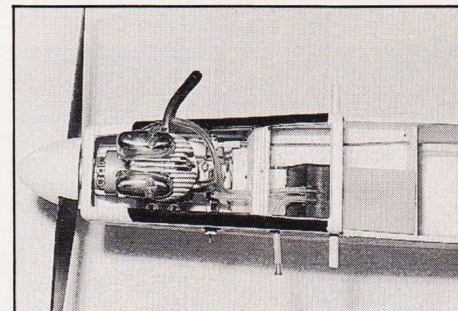
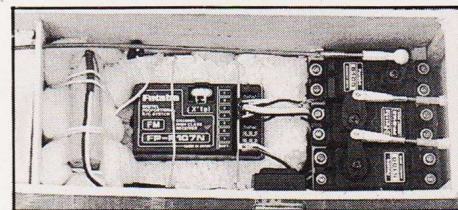
clearance hole for prop-driver. Now, sheet top and bottom of fuselage. Shape with razor plane and sanding block. Add epoxy resin at front end – use a heat gun to improve penetration, but don't boil the resin. Use cloth reinforcement, not chopped-strand matting.

### Undercarriage

Nose-leg is simply clamped behind engine mount. Main u/c is from 10g wire, pre-bent, bound and soldered. Important: use a fairly vicious flux – I used Carr's Black Label (I bet he doesn't drink it...); remember to rinse off when cool.

### Fin and Rudder

Use quarter-sawn 1/16in sheet and soft 1/4in. Cut two fin sides; pin one onto building board (this needn't be over plan). Fit LE, TE (note extended bottom which locates in fuselage), then spot-glue snake outer in place. The snake must emerge from the 'top' sheet well before the TE, so use glue, packing



pieces, and warm air to hold it until set. Fit rest of internal bracing, and bottom strip. Finally, fit top sheet and sand to profile. Rudder is similar, except that, before adding 'top' sheet, taper the 1/4in thick framework to lie flush with the 1/32in ply TE.

### Tailplane

From quarter-sawn 1/6in sheet. Anti-warp tips are worthwhile. No aerofoil; just round edges. Reinforce centre with ply. Gapless Solarfilm hinge was used on Mk. 3.

### Wing

Simple and quick (about three hours, using heat-accelerated water/Copydex mixture). There are good instructions on foam working in past issues of your favourite magazine (whaddya mean, you've lost 'em!?). Cut a set of cores for a friend, while the bow is hot. Trim cores to the size shown on plan (a smooth bread-knife and straight edge

# PHOENIX



*Phoenix designer, Peter Sztencel, looks happy with the model's performance.*

works well). Cut and fit balsa root ribs (Copydex) after you've cut out the spar positions in them. Now cut spruce grooves in the cores (U-shaped hot wire). Practice on waste pieces of foam, and ensure spar positions line up accurately. Fit spars (PVA) check that your building board is flat, then add LE sheeting. Cut slots for spruce joiners. Fit LE but don't shape it yet (use PVA). Join panels with spruce joiners (epoxy): cut these over-depth, and carve them to lie flush with all's dry. Check that TE of wing is straight. Only the LE are swept back. Fit

## Radio installation

A simple set-up is shown on the plan. The receiver sits in a styro-foam raft, held in by rubber bands. The aerial trials outside the fuselage and is threaded through a spare hold in the elevator horn. Control throws: Ailerons + 1/2in (initially), Elevator: + 3/4in, Rudder (small) one inch each way; (large) 2.3/4in each way (yes, really!). Set the elevator neutral as shown on the plan. If a more rearward CG is chosen (oh, you mad fool, you!), set at least 1/8in 'down' as neutral. Spins will be phenomenal, and

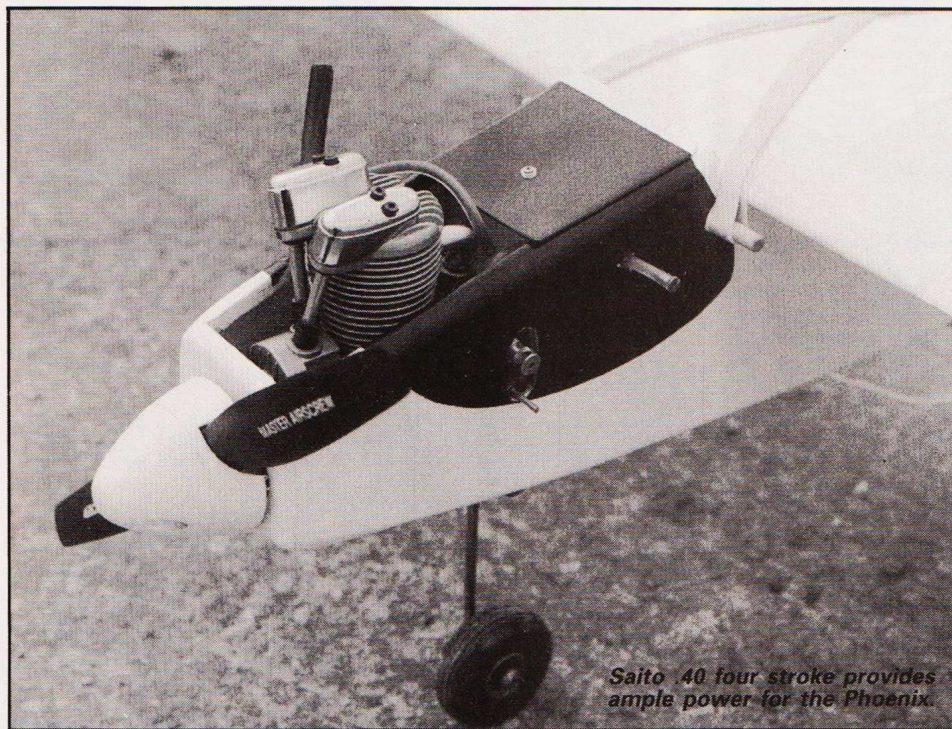
the glide will be like flying a slope soarer; watch out, though, as spin recovery will need some experience! Ensure engine tick-over is slow, otherwise the model will be reluctant to come down. All-up-weight of prototype was 4lbs 7oz with tank empty.

## Flying!

Take it easy on all controls; the model is very responsive (rate switches are an advantage). Most aerobatics are flyable at what may seem a ridiculously slow speed - the benefits of a really big prop. To fly sustained knife-edge, however, would require a 'hot' two-stroke, which would rather defeat the object (that is relatively quiet, buoyant aerobatics). The stall is hard to provoke, but gentle and straight ahead (if you balanced your wing accurately), when found. A favourite manoeuvre is flick-rolling, using the large rudder and ailerons. Spins can be as flat as your chosen CG will allow, both upright and inverted. Recovery is



*Ideal for slow, quiet aerobatics with a four stroke or out-of-sight performance with a hot two stroke.*



*Saito 40 four stroke provides ample power for the Phoenix.*

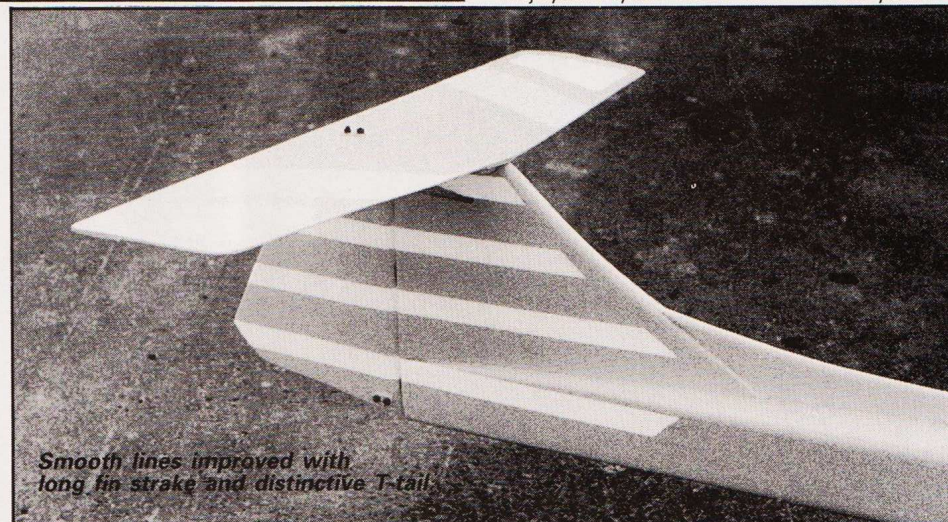
torque rods, and 1/2in hard balsa cover-block over centre section TE. Sheet centre section, top and bottom. Cap strips are fitted with usual Copydex/water mix (50-50, or 40-60), but use a 'hard' glue to secure the front ends, such as Zap. Cut ailerons to size, carve a profile, and fit fixed tip portion to wing TE before chamfering aileron LE. Now plane and sand wing LE to shape. Laminate and fit tip-blocks. Bandage and epoxy centre section. Cut and line servo well. Finally, and most important, check balance of wing; ballast lighter side.

## Covering

Fuelproof vulnerable areas of fuselage. I used Clearcoat, to match my choice of Solarfilm covering. I then jazzed things up with day-glo Solartrim (from which the Phoenix logo was cut).

simply a case of neutralising the controls. Landing is straightforward - even sideslip approaches (they give more drag, and so reduce touchdown speed), but make sure you are approaching very slowly - a too-fast glide is interminable! In good conditions, I've managed a thermal flight of 14 minutes (when deadstick); owners of fancy radios may like to experiment with flapperons and spoilers, to steepen the landing approach. The next phase (incarnation?) of the Phoenix will have an 8ft wingspan, and be powered by a really big four-stroke (yes, it'll have flaps, too).

I wish you every success with your Phoenix; if you enjoy it half as much as I've enjoyed developing it, then I'll have enjoyed myself twice as much as you...



*Smooth lines improved with long fin stroke and distinctive T-tail.*