AMD SKYHAWK

By Klaus Weiss

P.S.S. (Power Scale Soaring) as the name implies, are models of conventional engine powered aircraft, designed to perform off the slopes as gliders. The P.S.S. models usually depict military aircraft and can be finished as scale like as you wish, or just appear in the livery of sports models.

P.S.S. has gained a reasonable following all over the world and as a consequence, kit manufacturers are now producing reliable model kits on proven designs.
One new company, Aero Model Design, is manufacturing a nice range of P.S.S. gliders and the Australian release is generating a lot of interest amongst the slope soaring fraternity.

At present, A.M.D. have several P.S.S. models on offer, comprising a P51 Mustang, an A6M Zero, an AT6 Texan, a B2 Stealth Bomber, and the A4 Skyhawk review model.

The Kit.

The A4 Skyhawk kit has a polyester fibreglass moulded fuselage, complete with lightly moulded panel lines and well taped seams. The model is `stand off' scale but still looks very much a Skyhawk. The wings have an 890mm (30") span and are balsa?? (timber) sheeted foam cores with the leading and trailing edges fitted and shaped, tips shaped, sanded and fitted and ailerons bevelled and cut to size. There really isn't much to do here.

The stabiliser has also been constructed and sanded to shape. The wing is said to be a modified RG15, and when compared to a print out of the RG15 airfoil, shows it to be substantially thickened, but this should endow the model with a better stall characteristic.

The hardware items consist of wing hold down bolts, aileron torque rods, wing/servo mounting blocks, a strip of fibreglass cloth for joining the wings and a moulded canopy. You will have to supply your own elevator rod and connections.

Assembly.

There is precious little to do here, so lets start with the wings. I sat a wing half on the edge of the building board and blocked up the tip 6.5mm. With a long sanding block, sand the root rib with the block at 90 degrees to the top of the table. Repeat for the other wing half.

The wing should now join perfectly with one half flat and the other tip raised 13mm. That is the recommended dihedral, so when satisfied with the joint, it is ready to glue together with epoxy. At this point it is probably easier to cut the aileron servo well through the top of the wing before joining the halves, as you will have to cut through the cured epoxy if you do it later. Just cut a nice opening for the servo to sit in, making sure you don't cut through the bottom balsa sheeting of the wing. Cut the hinge slot in the wings for the aileron torque rod bearings and trial fit them with the ailerons and the slotted trailing edge centre pieces.
The instruction booklet states you attach these pieces with `ZAP CA+' but I would

strongly recommend that you use 30 min epoxy, as many of the CA glues will melt foam on contact. If you use the wrong type you will definately have problems. Lubricate the torque rod shaft from the hinge to where it sits into the slotted centre pieces, to prevent it from becoming permanently attached and immovable at that location. Mark the hinge location points on the ailerons and drill a hole for the torque rod. I actually replaced the ailerons and elevators with a harder balsa, because the supplied ailerons were far too soft. Cut slots for the hinges and trial fit the ailerons.

I usually cover the model before I epoxy the hinges; it is harder to get a nice finish otherwise, and this model deserves a nice finish.

The fuselage requires the most attention if you intend to paint it. Cut out the slot for the stabiliser and trial fit. Use a wide, flat sanding block to finish off the slot so that the stab fits snugly and the tips measure an equal distance from the building board. Wash the fuselage with warm soapy water and allow it to dry thoroughly. If you have any acetone, give the dry fuselage a wipe over with a dampened cloth to remove any oily residues. The fuse has many `pinholes' so use a grey primer/filler to eradicate them. I needed to fill three times before I got a good surface to paint on. Wet sand most of the primer off, with about #400 wet and dry, between coats then cut it back with #800 after you are satisfied with the final filler/primer coat. Give the fus a final LIGHT coat of primer to fill any scratches or blemishes from the sanding process and when dry, apply the finish colour coat.

A fellow club member, Bruce Kerl, used his talents with the spray gun to finish this model and it looks very nice indeed. We spayed it with a two pack epoxy paint, but any acrylic or enamel would be fine.

Trim the canopy to shape, and when happy with the fit paint it on the inside to show the

frame lines. I attached the canopy with ZAP A DAP A GOO, which dries clear and will not let go.

Align the wings on the fuselage and decide where the wing bolts are to go. Attach the timber mounting blocks to the fuselage with epoxy. I reinforced mine with a couple of strips of glass cloth. Align the wing and tape it in place, making sure it doesn't move as you drill the front hole through the wing and mounting block. I finished the front hole and fitted the wing bolt to hold the wing snugly in place while I re-checked the alignment and drilled the rear mounting hole. Fit the stabiliser and check alignment. I cut the hinge slots and covered the stab before attaching it with epoxy. Remember to cut away the covering where the surfaces are to be glued. The elevator drive was manufactured from piano wire and a short length of brass plate, which was silver soldered in place, was used as the control horn. A fibreglass arrow shaft drives the elevator.

The elevator servo was laid on its side and attached with 'L' shaped brackets to a plywood plate, which was epoxied to the underside of the cockpit near the turtledeck bulge. At this location it is easily accessible and out of the way of the battery / receiver and wing bolt. My model balanced at the recommended point with no lead ballast required. Foam rubber was packed into the nose of the model then the foam wrapped battery was located to balance the skyhawk, and finally the receiver was placed into the nose. Further foam was pushed into the space to secure the radio gear and the model was ready for test flying.

FLYING.

The Skyhawk was balanced at the recommended CG, 127mm (5") from the leading edge, at the centre wing root. Control throws were set at 9mm up and down elevator and 13mm up and down on the ailerons.

My Skyhawk had a finished flying weight of 810gm (28.5 oz.) which surprised me, due to the fact I used a lot of paint on the fuselage and standard size radio gear. I was going to take the photographs on the initial test flights, so Bruce Kerl was again enlisted to assist with the flying duties. We had to wait a couple of weeks for the wind to blow from the right direction and time was passing by rapidly. The day finally came with a 15 to 20 knot breeze blowing from the north east, which is not an ideal direction in this part of the world.

We flew at Sandon Point, on the south coast of N.S.W. as this was the closest slope available to us in the prevailing conditions. The lift band was fairly narrow here, and little margin for error was allowed. I'm glad I was taking the photos. (initially, anyway.)

A firm push into the lift and the Skyhawk sailed out rock steady. Trims were just about right and the little model looked really good in the air. Quite a few spectators stopped to have a look, with comments about how `quiet the engine was.'

The Skyhawk just begs to be flown at speed, and as a consequence reflexes need to be sharpened. I would predict that this model could come to some grief in the hands of an inexperienced flyer and therefore wouldn't recommend it for a novice pilot. Intermediate and advanced pilots will have a ball though.

On a good slope with plenty of lift, the skyhawk will really perform, but on the test slope, there was not much opportunity to try out its aerobatic capabilities. The skyhawk can be slowed down for graceful flybys but it can begin to waffle around a bit if flown too slowly, and a floater it isn't.

On the second flight, the little jet flew through some turbulent air just as a turn was being initiated and a wing tip was hit with a gust of wind, causing the skyhawk to roll and fall out of the lift band and onto the only clay and rock patch at the site. The resultant damage consisted of a sheared off nylon wing bolt and some of that natty paintwork scraped off the fuselage, so that put paid to further flying for the day. The damage will be easily fixed and everyone is looking forward to more flying with the skyhawk.

My impression is that this will be a popular P.S.S. subject on the slope and the performance in the marginal lift conditions where it was tested, confirmed to me that this small jet will deliver the performance it has been designed for, and yet be able to fly quite sedately if desired. With a wing loading on the test model of around 14 oz sq ft, the skyhawk should be flown in winds of at least 10 knots.

If you `feel the need for speed'? Then go and check out one the the A.M.D. PSS gliders at a hobby shop near you.

Model supplied for review by L. O'Reilly Pty Ltd. 42 Maple Avenue, Keswick S.A. 5035.

SPECIFICATIONS.

Stand-off scale McDonnell Douglas A4 Skyhawk. Fibreglass fuselage with balsa sheeted foam core wings.

Wing span:	890mm (35 inches)
Wing area:	275 sq inches (makes more sense to me when expressed in Imperial measure)
Wing Loading:	15.7 oz sq. ft. (projected)
Length:	790mm (31 inches)
Weight:	850gm (30 oz.)
Airfoil:	Modified RG15
Controls:	2 channel - aileron / elevator.