Panic Attack (or Valley View ACE)
Building instructions (revised for the ACE)

This model evolved from a rough plan on the Internet, which some of the boys in Adelaide had built and flown, but which had a few disturbing traits, such as suddenly tucking the nose at high speed, causing much anxiety (hence the name 'Panic Attack') to the pilots. Looking at the design, I applied knowledge from the nineteen fifties when diesel powered 'flying carpet' free flight models were the rage. These were used in free flight scramble events in Australia where one tried to log up as much flying time in an hour, with a maximum flight time of two minutes, and always launching from the same spot. Being a flying wings of sorts, a reflex trailing edge was used to make them stable. Using this knowledge, I said to myself "I can easily improve the performance and potential of that design", hence this plan.
With the advent of very cheap and reliable radio equipment, this model can easily be built in a very short time and is quite robust until meeting another coming the other way during combat!
Please be warned that this is not a beginner's model, due to being unable to survive any major fast arrival with mother earth, but could be flown on reduced throws by any pilot who is capable of flying a trainer!
Construction is entirely of 6mm 'Depron' foam, with a little ply where needed.

Before beginning the **construction** of this model, you will need the following items:-
One sheet of 6mm **Depron.**
A glue that will not attack the Depron sheet such as **UHU** (either 'twist and glue' or 'Creative' for foam)
Ultrafly 'Speed Lock' or **'foam safe' cyanoacrylate.**
A straight edge (I use two steel rules 300mm & 1metre depending on what length of foam you are cutting at the time).
A roll of 18-19mm sticky tape (**Sellotape, Bear or similar high quality tape**).
A **Stanley 199 Knife** (or similar) with a **new sharp blade**. The wide blade knife is important as it allows for more accurate control over the cut, as freehand cuts are needed some of the time.
You will also need a **Transmitter** that is capable of mixing a '**delta**' configuration, where aileron and elevator are mixed. I have also used a glider radio, and did the mixing by turning on the V-Tail mix, and then using a free mix to mix the aileron with rudder 100%. The mixing may also be done with a cheap add-on mixer sold by most model shops depending on what mode you fly. (I fly mode 1)

Making a KIT.
Start by marking out a **'kit of parts'** from the sheet, as shown in one of the photo's, using a fine sharp pointed felt pen for this job. Use a fine pen to 'pin prick' through the plan to mark the fuselage outline and interlocking parts onto the foam, and then carefully draw through the points to get the fuselage shape. The shape of the fuselage is not critical. Note the interlocking cut outs in the wing and fuselage, as these are needed to keep the whole model strong and rigid.
Cut out the parts, taking care to keep the knife vertical at all times as this will allow for more accurate assembly later. I actually lived dangerously and cut the parts out on the kitchen table, using copious amounts of old newspapers underneath. With some of the scrap pieces, practice using your finger as a guide to 'pare' the sharp edges (as needed to round the surfaces), and to use the steel rules with the knife at 45° to cut chamfers on some of the parts without removing your skin!
When finished practicing, carefully pare a small chamfer on each edge of the wing, except the trailing edge of course. Also chamfer the fuselage outside edges, but not the centre parts that are glued together. Lightly sand these edges to give a relatively smooth rounded edge. Round the outside corners of the wing, using the diameter of your favourite coffee cup, or the nearest tin!

Construction.
You are now ready to proceed with the construction. Do a quick test fit to make sure the interlocking fuselage parts fit, and then glue the bottom side into position. Allow plenty of time for the glue to set, as if you get impatient, the whole thing may spring apart. If desired, a 'hot melt' glue gun can be used to hasten construction, and with a little practice beforehand, can be done neatly.

When completely dry, turn the wing over and glue the top fuselage section into place. Check to make sure the fuselage is at right angles to the wing. Hold together the two halves at the front and back with masking tape until the glue sets fully if using the slower setting glue.
While the glue is drying, the motor mount is made from 3mm plywood. Cut to shape and then glue into place using a more substantial glue than the one used for foam, such as 'No More Nails' or similar construction type adhesive (but try them on foam first!) You could of course use epoxy if you so desire. I also run an extra fillet of glue down all joints at this stage, allow it to dry, and then add the bottom strengthening gussets on both sides. The top fairings are added later to suit the radio installation.

Mounting the elevons.
The **elevons** are now chamfered at about 45^0 on the underside at the front (as shown on the plan) to allow the desired movement later when setting up the controls ready for flight. Use a good quality sticky tape (such as Sellotape, Bear, etc., not a $2 dollar shop equivalent) for holding them in place. Fold the surfaces back on themselves at the top of the hinge line, and tape with a long piece (50mm) at both ends, and one in the middle of the elevons at right angles to the hinge line. It helps to have the wife (etc.) help at this point as the depron does not want to stay straight, or in one place! While keeping them in that position, apply a full length piece of tape along the entire hinge surface, making sure to keep it central. This will allow about 2-3mm of overlap, which can be folded onto the outside surfaces to give a good grip. Now fold the surfaces back to their normal position, and with the wing flat on the bench, apply three longer pieces of tape crossways, then apply one continuous length of tape along the top surface to complete the operation. (To those who have hinged this way before, this is a fairly standard procedure.) I have yet to have it fail, except in a crash or collision! Cut the tape away at the point you want to mount you control horns and glue them into place with the construction adhesive. I make mine out of 1mm plywood (as shown in one photograph) for models this size and have yet to have a failure.

Adding the motor.
The motor is next to be added. Depending on what motor you are using, will depend on the mount you fit, but the cheapies I use come with a flat backplate, which can be simply screwed on to the plywood plate. If you recognise the motor (an E-Watts R2822) in the pics, I would suggest one modification. It only has two locking screws, which have to be released to remove the motor to screw the mounting screws to the firewall mounting plate, and if, when reinserting them are tightened to much, tend to bind the bearings. Simply drill two 2.5 mm holes at right angle to the other two, and tap a 3mm thread to make four locking screws. Problem solved!
I am suggesting a motor of about 100 to 150 watts, using a 2S or 3S LiPo of about 800-1000mah capacity, using the motor rpm/volt from 900-1500, and to choose the prop between a 7x3-6 to an 8x4 to give a current draw of about 7 or 8 amps. This should give more than adequate performance. They have flown satisfactorily on about 70 watts, but with reduced performance!

Fitting the Radio Control parts.
Make up two identical sets of control rods with 'z' bends at both ends. Set up your radio transmitter on the bench, and activate the 'delta' configuration (or use the other suggestions at the start of this article). Connect the servo's to the Rx, connect the ESC and the battery. Check that the servo's are going in the right direction, and that left signal is left aileron up and right aileron down, and that UP is UP and DOWN is DOWN etc. If not, alter your mixer controls until you get it right. If you cannot get it right, try servo reversing or swapping the servo leads over from aileron and elevator until all is correct. Centre the trims and sub trims on your Tx. Remove the servo arms and adjust to neutral. When correct, clamp some pop sticks to the top and bottom of each elevon to keep them neutral, add some good quality double sided tape to the underside of each servo (after wiping it clean with methylated spirits), feed the 'z' bend into the control horns and servo arms, and carefully push the servo's into place. If you do not get it right first time, remove the tape and put on a fresh piece. Do not reuse the old piece, as it will only fail at some time! Or you can use the hot melt glue again. A small rectangle must be cut just above the wing to allow the right hand servo lead to get to the other side. The approximate position of the servo's are shown on the plan, but this position is usually dictated by the lengths of wiring from the Rx to the servo's, and the Rx position (mounted the same as the servo's) is determined by the length of wiring from the ESC, which

should be mounted (again with double sided tape) just a little behind the motor, allowing you to mount the battery pack with 'velcro' so that it can be adjusted to alter the centre of gravity to suit your flying styles. Holes are again drilled to get the ESC power leads through to the battery side. Now connect your motor to the ESC, and make sure it is rotating in the right direction before fitting that finger cutting device (the propellor) at the front. In fact, I even do the mandatory range check before fitting the prop for added safety. The Rx aerial is simply taped to the top of the fin, and trails behind. I use the GWS 6 channel receivers for these models, as they are cheap, and have better range (1000ft) than the 4 channel one (500 ft). These receivers are perfectly adequate for this application as at a distance, the "Panic Attack" gets pretty small very, very quickly at full throttle!
The actual movement programmed into the control surfaces is shown on the plan. I suggest using rate switches to cut the movement to about 50% for the first flight, to subdue the performance and get used to the model. Once familiar with the model, the movement can even be increased if you desire.
Once the gear is fitted, the final strengthening gussets can be added, and the streamlining fairings added to suit from scrap.

Finishing the model.....

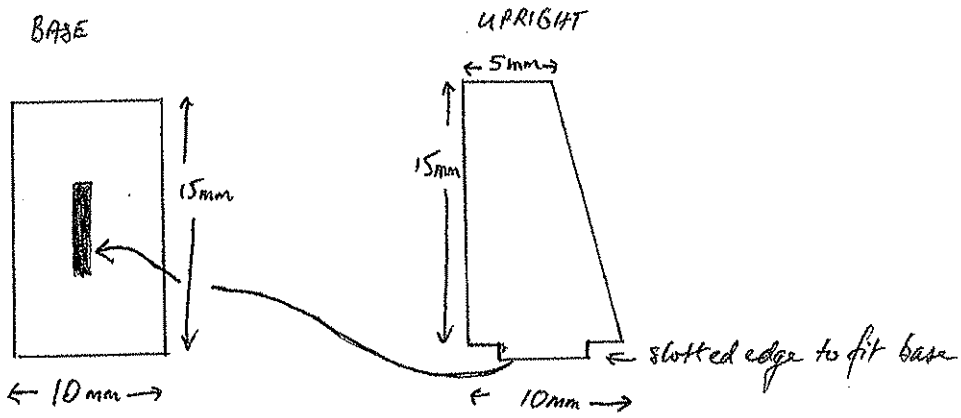
T o paint or not to paint, that is a big question. The lighter the model can be kept, the better will be the performance. On the model I made to photograph the construction for this article, 25 grams of stickers were added to the weight, unless the white Depron is heavier than the grey sheets! But one consolation is that the white model is much easier to see in the air, and the visual orientation is much better too. The grey prototypes became almost invisible at dusk, especially when flown against a tree lined background.

Flying .....

Do a final radio check, checking that the surfaces are going the right way, and then a final range check. If all is well, then we are ready to go. Hold the model just above the battery pack, up at about a 30^0-40^0 angle, apply about half throttle, and just give it a push off. After getting the trims sorted out (if any are needed), full power can be applied! You will be surprised at the rate of speed attained. If the model noses up quickly, apply a little down trim until, on full power, only a slight climb occurs. Roll rate is extremely quick, and looping radius in both directions is quite small under full power, and horizontal eights (control line style) can be done with about 3-4 metres of altitude!
My favourite trick is to launch, check the trims, apply full power, pull the nose up, and then roll vertically until almost a speck in the sky, cut the throttle and glide for the next minutes or so. When you throttle back, some up may be needed to be held, rather than alter the trims, especially if you are doing a glide test. The glide is surprisingly flat, and when too much up is applied, the wing will begin to waggle from side to side, and the model will mush rather than stall. In a slight breeze, the model can be mushed in at zero groundspeed, usually at your feet! If you are in trouble near the ground, just get the nose vertical and apply full power to put altitude under you. If a crash is imminent, just cut the throttle and let it crash. Usually the only damage is a broken prop, especially if using a GWS 7x6!
Do not worry too much about the amount of flex in the wing during full power aerobatics. I have folded a wing on the original, but it had been repaired after coming down in two big pieces during a combat session, and my repair was inadequate. Anyway, it is simpler to build a new model than try to repair the crashed one, unless the damage is minor. Precise hovering is not an option because the model does not have a rudder. Maybe next time!

CONTROL HORN CONSTRUCTION

- 1.0mm PLY
- Superglue
- Sodium bicarbonate (filler)



Instructions:

- Use a pencil to outline the Base and upright on 1.0mm PLY as above
- Cut out the base + upright with a Stanley knife
- Insert the slotted edge of the upright into the slot of the base
- Use superglue to adhere the slot
- Fill the superglue join with a small amount of Sodium bicarbonate while the glue is still in a liquid state
- Hold the 2 parts at 90° to each other until the glue sets.