

# CAP 232

**GORDON BOOZER LIFTS THE LID ON THE LATEST GREAT PLANES AEROBAT**



**W**hen I was asked if I would like to review the Great Planes CAP 232, I immediately accepted. Who wouldn't? It wasn't until I'd put the phone down that I began to wonder what I'd let myself in for. Well, there was no need to be concerned.

I don't often pay much attention to the kit box. After all, it's only a couple of large sheets of cardboard, folded over, printed

with a picture of the model and the manufacturer's name. However, this box really caught my eye. There were photographs of the CAP in a red, white and blue colour scheme on both ends, whilst the long sides portrayed good quality photographs of the various stages of construction which give a very good indication of whether the kit is for you or not. Two other colour schemes were shown, one of which I chose for the purposes of this review, along with specification details of the model and the engine range required.

The CAP is a rather 'square' aeroplane with well defined lines. This makes it very easy to build and cover especially for a semi-scale sport model. Framing the model is very

*Don't you just love kits? It's almost a shame to have to build it!*

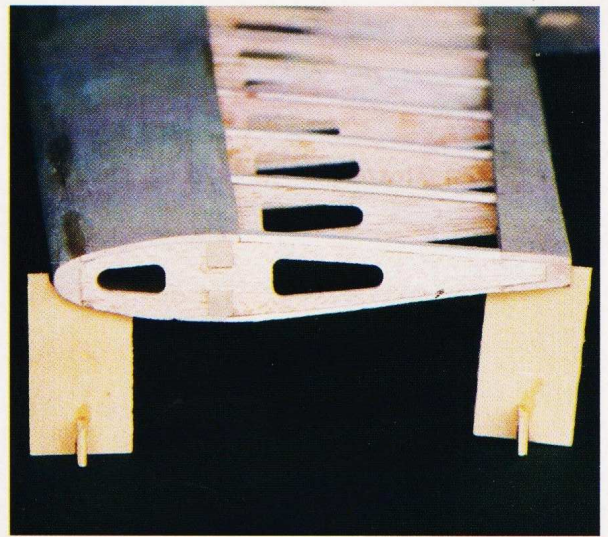
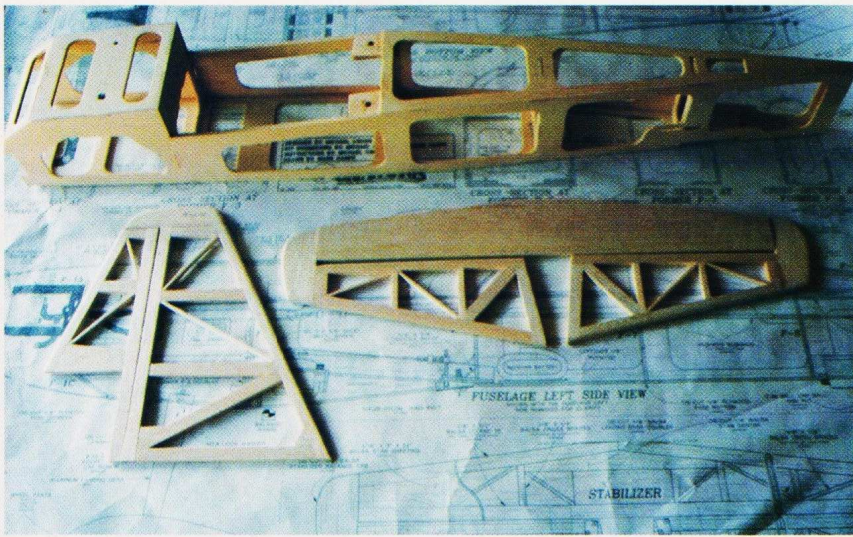
straightforward, as most of the structure features interlocking balsa and liteply. The turtle deck sheeting may look a bit awkward, but follow the instructions and note my comments and you'll find it pretty easy.

## WHAT'S IN THE BOX THEN?

First to hit you is the 42 page construction manual. It's full of information, hints and tips, photographs and step-by-step instructions on construction. For example, there are three

A4 size pages on building the tailplane, elevators, fin and rudder. Also included are two very fine and detailed drawings which show the O.S. 46 FX in the side view and an O.S. 70 FS in the plan view of the fuselage. The balsa is of excellent quality, the grades being about right for the parts specified. All the formers and wing ribs are die cut and fall out of the sheets with ease. An ABS cowl is supplied along with wheel pants (also ABS) and both are of a reasonable thickness, unlike some





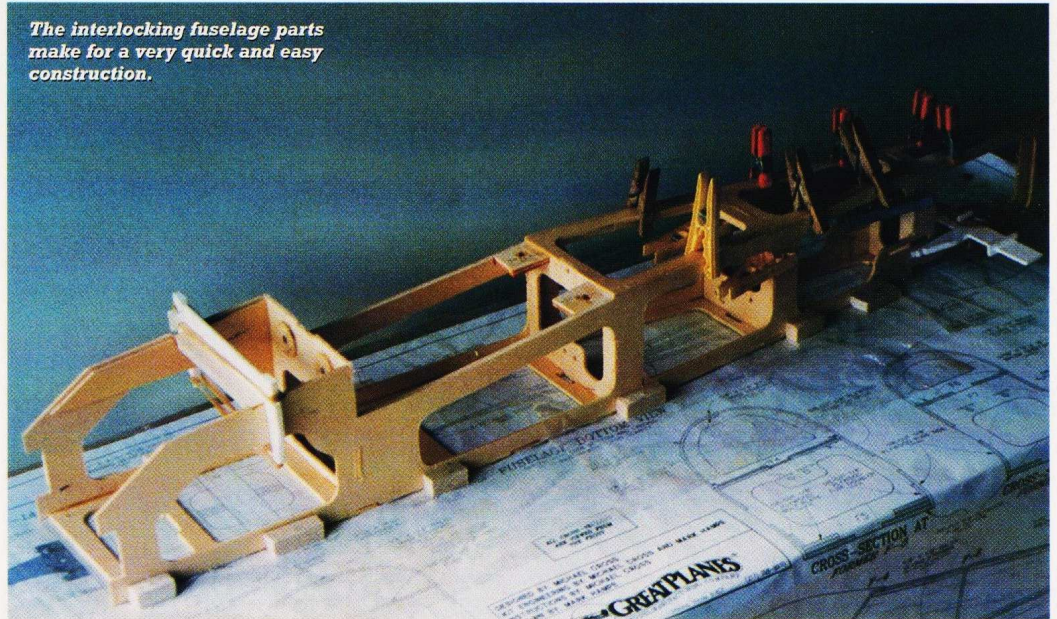
kits I've seen. As you dig deeper other delights are uncovered such as a pre-formed and drilled aluminium undercarriage, an adjustable engine mount and a plastic bag bulging with nuts, bolts, screws, clevises, washers and a few ancillary pre-formed parts. Finally, at the very bottom is a sheet of beautifully produced decals to add the finishing touches.

### MANUAL

The introductory section of the manual shows three lists: required accessories, building supplies and tools and optional supplies and tools. The manual states that the CAP is a semi-scale fully aerobatic model, not suitable for beginners to our hobby. However, it is so detailed in explanation of the construction - they even tell you to cover the plan in protective paper - that should an inexperienced modeller buy one, they would have no problems with its construction... flying it might be a different matter! Each stage of the construction is explained in great detail and has a photograph as a visual back-up. When finished, there is a small box to tick showing that the item has been completed. So, let's get started.



**The interlocking fuselage parts make for a very quick and easy construction.**



### TAIL END CHIT-CHAT

The tail surfaces are simple, just 1/4" x 1/2", 1/8" x 1/4" and 1/8" square balsa for bracing pinned and built over the plan. This method applies to all tail components, elevators, tailplane, fin and

rudder. The tailplane is covered with 1/16" sheet for some added strength.

### WINGS

Built-up construction with a symmetrical rib section. 5/16" square hardwood is used for the top and bottom spars whilst 3/32" balsa is used for the wing ribs, spar, shear webs, and the top and bottom leading and trailing edge sheeted sections. The actual 'leading edge' section comes ready-shaped. A photographic example with measurements is given to explain the shape to cut for the top and bottom leading edge sheet. Using the sizes given, I found these to be very slightly undersize, so watch that one.

When it comes to joining the completed wing panels a 5 foot long board is required, or a perfectly flat garage floor; you could of course use the dining room table, but don't quote me on that one. For joining the wing panels a collection of jigs are supplied which are placed under the wing tip leading and trailing edges and at the trailing edge of the root section. Epoxy glue is applied to the top and bottom wing spars and the dihedral braces; these are then clamped together, the jigs positioned and weights applied to hold everything in position while it's left to dry. The remaining construction consists of the installation of a servo

*(TOP LEFT) Completed tail surfaces and fuselage over the full-size plan.*

*(TOP RIGHT) Wing jigs supporting the tip at the correct dihedral.*

*The tail end, very clearly showing the enormous rudder.*

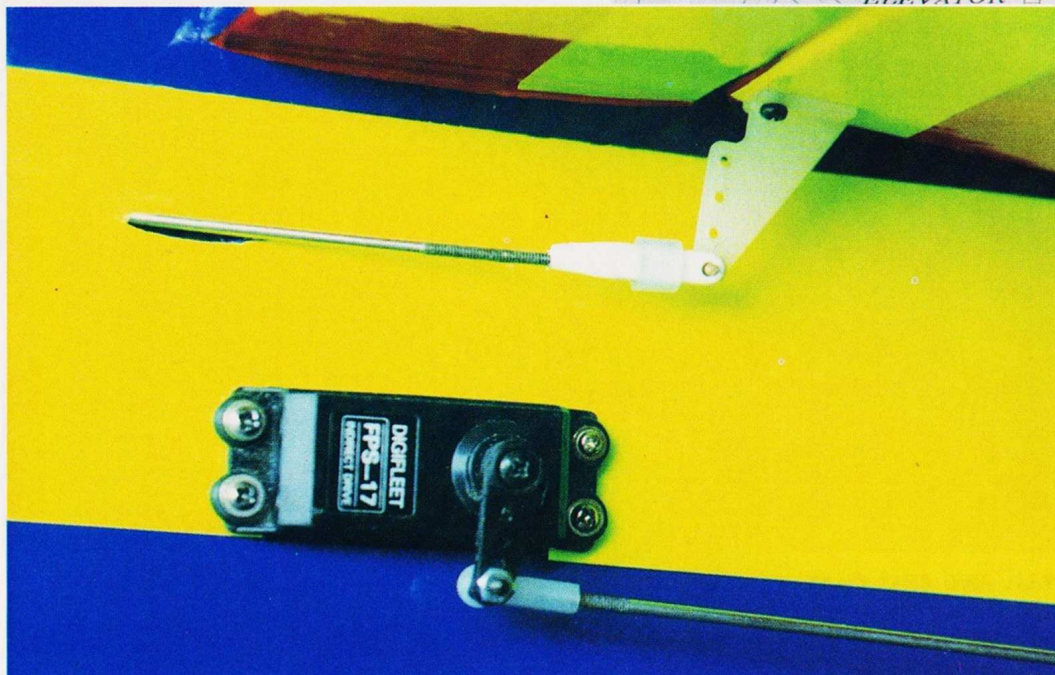
*The revised 'side mounted' rudder servo position which nicely avoids the debris left by careless sheep.*

tray, centre section top and bottom sheeting and aileron torque rod installation.

## DON'T LOOK NOW - IT'S THE FUZ!

The fuselage is constructed mainly of liteply with the two sides, top and bottom pre-cut and pressed from sheet. Formers and items like the undercarriage plate, stabilizer base and fin plate are all interlocking; it all goes together like a jigsaw. The basic framework is assembled dry and when satisfied that it's true you simply run cyano in the joints. When it comes to constructing the front and rear turtle decking, I advise you to make

*Fuselage side with the servo in its new location.*

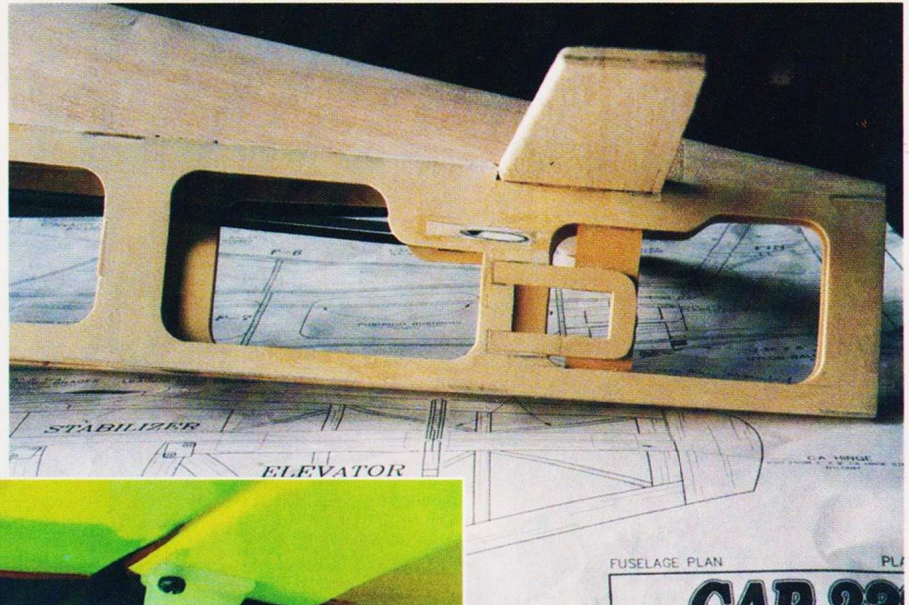


patterns from thin card before cutting the balsa sheet. A good idea when building up the rear fuselage fairing at the base of the fin is to place a piece of 1/4 sheet, dry, between the wood used for constructing the fairing. When you have it shaped, remove the piece of 1/4 balsa ready to accept the fin.

The receiver and fuel tank are mounted on a removable tray, the front of which slots into the rear of former F1A, (the firewall) and is secured by a retaining bar on Former F3. I used a SLEC 11 oz tank which should give me a good 10 minutes of flying with the O.S. 46 FX on board. If you use a four-stroke, then the battery is placed on a tray at the rear of the cockpit.

The control for the elevator, i.e. twin pushrods, was a new one on me. It consists of two plastic tubes which are passed through the formers then taken out through the fuselage sides at the rear. Two 16 swg rods are used, each one connected to its respective elevator horn and passed through the plastic tubes. In the servo bay, one rod is made shorter than the other and they are joined together using two wheel collets. The longer rod is then

*One of the best boxes I've seen in a long time... if you like that sort of thing!*



Now, if you're lucky enough to fly off a concrete or tarmac strip, all well and good. I fly from a field which is frequently shared with a very large flock of sheep; we keep the strip mown, but I really didn't fancy dragging an exposed servo through all the 'muck and bullets'. Result? I've positioned the servo in the left-hand side at the rear of the fuselage to help reduce the risk of damage.

The engine mount supplied is adjustable to accept various sizes of engines whilst the firewall former F1A is marked with the position of the mount bolt holes and the hole for the throttle linkage.

## MOUNT UP

Recommended engines for the CAP are 40 to 46 two-strokes or 52 to 70 four-strokes. I used an O.S. 46 FX which is one of the engines shown on the plan (the other being the O.S. 70 FS) and fitted a Pitts style silencer supplied by 'Just Engines'. This particular muffler is a B.C.M. (in cowl scale) muffler available only from them with a wide range to suit most popular engines. The cowl is approximately 6" x 6" x 5" and is large enough to completely enclose the engine and silencer, leaving about 1" of the twin pipes protruding from below in a very scale-like manner.

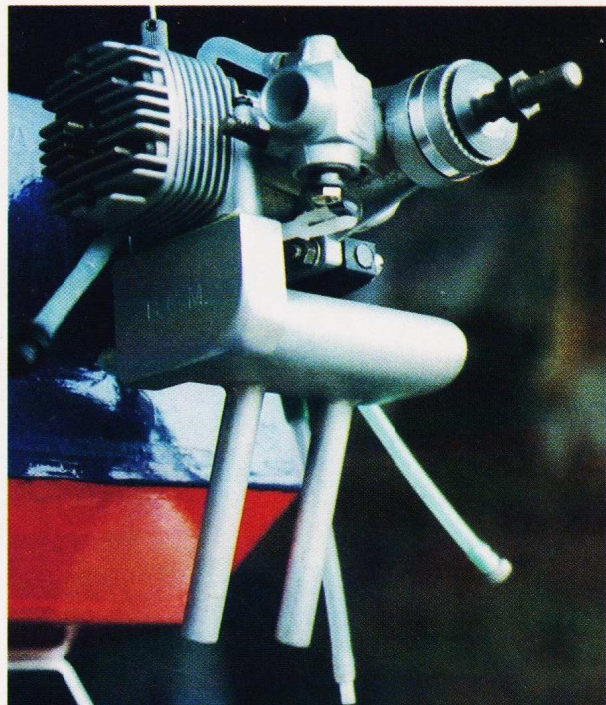
The cowl, and the wheel pants for that matter, are moulded in a substantial ABS plastic with the cowl supplied in

connected to the servo arm using a Fastlink connector, which is supplied. The system is designed to give positive control with no slack, and it works!

## MUCK AND BULLETS!

I used my Fleet 'Omega 5' Sportsman radio with the standard F17 servos. With the Adjustable Travel Volume (ATV) facility on the Omega the controls were set up very quickly using the measurements given in the manual. The PCM receiver is mounted on a liteply tray wrapped in foam and screwed to the fuselage with the throttle and elevator servos positioned alongside. The rudder servo is shown mounted at the rear of the fuselage in the underside, exposed to all the elements.





three pieces: front, top, and bottom and each of the spats in two halves. All require a certain degree of care and patience to assemble, but don't let that put you off. When glued together, filled with Micro Balloons filler, primed and painted, these really look the business.

#### FINISHING OFF

Profilm and Protrim were used for this model, no problems here, but do watch out when you remove the backing paper from large pieces. If you remove it too quickly, you can get a crazed diagonal pattern in the covering which is difficult to remove.

The canopy supplied is crystal clear and when cut to the lines etched in it the fit is very good. You can if you wish glue it in position on the fuselage - all details are in the manual - however, I chose to attach mine with very fine self-tapping screws. The model, when complete weighed 5 lbs 11 oz and to balance at the correct C of G position I had to add 5 oz of lead to the engine bay.

I was now ready for a test flight, all balanced and charged up, however, the Editor asked for a photo session before the flight. Perhaps he knew something that I didn't. So a date and time were arranged and off I went to Nexus HQ. I had a very pleasant

*Gordon poses with the CAP shortly after the first, and almost fateful, flight - thank goodness for that big rudder.*



couple of hours there, talking to the photographer, discussing the various angles that he was using to photograph the CAP and drinking

coffee. Then it was home once more to await a suitable day for the test flight

#### AWAY WE GO...

That day arrived two weeks later and what a day, it couldn't have been better. For once the weather forecasters had got it right; by the time we had got to our strip and had a coffee to calm the nerves, the field was bathed in bright sunshine, clear blue sky and next to no wind. Perfect! The usual checks were carried out, range check, correct sequence of the controls and a reliable motor, set the flight timer and off we go.

Now, although I've been building and flying R/C for about 20 years I'm knocking on a bit and perhaps my reactions are not as good as they ought to be. So, as this was a slightly more important test flight, being a kit review, I asked my clubmate Archie to carry out the initial flight; his aerobatics are better than mine too.

*(TOP LEFT) The huge cowl quite literally swallows the O.S. 46. Note the two-piece ABS wheel spats. Pilot: 1/15 scale from A.H. Designs.*

*(TOP RIGHT) O.S. 46 FX with B.C.M. custom made silencer from Just Engines.*

## DATAFILE

<b>Name:</b>	CAP 232
<b>Aircraft type:</b>	Fully aerobatic semi-scale sport model
<b>U/C configuration:</b>	Tail dragger
<b>Manufacturer:</b>	Great Planes Model Manufacturing Co.
<b>U.K. distributor:</b>	Ripmax Plc
<b>Retail price:</b>	£139.99
<b>Wing span:</b>	58"
<b>Fuselage length:</b>	52"
<b>Wing area:</b>	594 sq. ins
<b>Wing loading:</b>	19 oz / sq. ft.
<b>Finished weight:</b>	6 lb (includes 5 oz ballast)
<b>Req'd No. channels:</b>	4
<b>Engine range:</b>	40 - 46 two-stroke 52 - 70 four-stroke
<b>Engine used:</b>	O.S. 46 FX with B.C.M. in cowl muffler, available from 'Just Engines'.
<b>Fuel tank:</b>	SLEC 11 oz
<b>Radio:</b>	Fleet Omega 5, PCM 7 channel receiver, 4 x F17 servos.

## MODEL OF THE YEAR REVIEW



*Some care and attention to detail will pay dividends when cutting and assembling the cowl parts.*



With the faithful old O.S. running at full power it went off straight and level climbing away with great authority. Archie requested two clicks of down elevator trim and three

clicks of right aileron, whereupon he had it flying across the strip straight and level and 'hands off'. Several manoeuvres followed including loops, rolls and a couple of reversals before the throttle was closed to check the stall and slow flying. As it reached

the stall the nose dropped slightly and it then began to descend in a shallow glide, there was no tip stall.

The power was increased and as a turn was commenced Archie lost all control of the aileron. The power was cut and the CAP began to descend in a spiral glide, after a few anxious seconds and at about 150 feet from the ground, control was regained using just the rudder for steering. Thankfully, Archie's landing was perfect and there was no damage. The wing was removed and it was then established that the gears on the servo head had stripped and had remained in

the neutral position. Someone was watching over us! The ensuing enquiry confirmed that a combination of pilot skill coupled with the CAP's large and responsive rudder had undoubtedly saved the day. It was apparent from the 5 minute flight, that the aeroplane was smooth and gentle to fly on low rates and with the required pilot ability we surmise that it will practically do the book.

Certain modifications were made before the next outing these being to change the 8 oz fuel tank to a 12 oz to give more duration, alter the aileron movement to improve the roll rate and reduce the elevator travel by 1/4" to make it less sensitive in pitch. Before this latter alteration you only had to breathe on the stick and it was up, over and on its way down again before you realised it.

Inverted the CAP required no trim change, just a light forward pressure on the stick to maintain level flight. Weighing in at 6 lbs, which included 5oz of forward ballast, equipped with the O.S. 46FX and the Pitts style silencer from 'Just Engines', the power was adequate. The average everyday flier would have no problem with this model. It fits in the back of my Escort fully assembled. I enjoyed building the CAP and certainly look forward to many more flights with it.